Forum

Charles University Magazine
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Zuzana Golec Mírová

Secrets of the **Moravian** Karst

→ 40

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PHOTO BY Vladimír Šigut

Dear readers,

The English edition of *Forum* magazine is a chance to reflect on many of the year's successes: goals achieved as well as projects just begun. It's a time to check the scorecard and assess how we did and how we are doing.

This year, not one but several prestigious education ranking surveys showed CU is the top university in the Czech Republic. It gets even better: in June, the QS World University Rankings 2024 placed CU among the top 250 universities worldwide. It thus ranks among the top 1.5% of educational institutions in the world. In the survey, the school ranked 248th out of 1,500 schools overall, improving by 40 spots compared to 2022.

CU continued to make its mark as a research university, with three candidates winning ERC Starting grants. Scientists profiled in this issue, Zuzana Musilová and Matyáš Fendrych, clinched two ERC Consolidator grants while CU professor and cardiologist Zuzana Moťovská received the national Czech Head Award. Our researchers also did exceptionally well at this year's Neuron Awards and we encourage you to find the details about all of our recipients at www.forum.cz/en.

This year, we continued key international cooperation in alliances such as 4EU+ and the CE7 and deepened ties in our partnership with the University of St Andrews (one of the topics in our opening interview with acclaimed poet and academic Peter Mackay). In this issue, you can further read about our contributions to education and medicine, the arts as well as science – including a remarkable contribution to the microshutter array system on the JWST, which is changing our perception of the universe almost daily.

Sadly, that perception – as well as current successes – have also been overshadowed by suffering and conflict. The war in Ukraine continues and we saw a new conflict emerge in the Middle East. The aggression and violence are sobering and require our attention. Allow me to say it again: we stand in solidarity with all our students, affected directly or indirectly, and reject all forms of aggression and hate. Aggression and hate have no place in any society or circumstance. Like most people around the world, we strongly hope that the situation will improve in the months to come. We also pledge – as a university – to do everything we can to contribute to better days ahead.

All the best and may you find a wealth of inspiration in issue No. 12 of Forum EN.

Milena Králíčková
Rector of Charles University

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A single overly academic syllable can **sink** a poem

Peter Mackay is a man of many interests and talents: he currently works as Senior Lecturer in the School of English at the University of St Andrews and has been hailed by critics as the best poet of his generation writing in Scottish Gaelic. Not only that, but he also serves as the captain of the Scottish Writers' Football Team.

STORY BY **Petra Johana Poncarová** PHOTOS BY **Michal Novotný, Martin Světlík**

The courtyard and garden of St Mary's College at the University of St Andrews

Czech scholar Petra Johana Poncarová met up with the Scottish poet and academic in Prague recently on behalf of *Forum* magazine. As an accomplished translator from Gaelic and having translated Peter Mackay's work as well, Petra was ideally placed to discuss his poetry, gaps in Scottish Studies, Mozart, and the strategic partnership between Charles University and the University of St Andrews. A great interviewer and interviewee. Thank you both.

You are a respected academic and an acclaimed poet. The twinning of these roles is not an entirely unusual one, but how has it worked for you: what are the benefits and the drawbacks?
It is very hard to make a living as a poet; but it is also very hard to make time to write poetry when doing a full-time academic job. At its best, the reading and thinking for the academic work opens new windows, excavation points, cloud-rifts that poems can slip through – and which can then feed back into new understanding of the books I am discussing, the odd literary histories I'm exploring. At its worst, it is difficult to get the tone of whatever one is writing just right: even one overly academic syllable can sink a poem.

Thanks to the strategic partnership between Charles University and University of St Andrews, you recently gave a lecture at the Faculty of Arts in Prague and also a poetry reading at Kampus Hybernská. However, this was by no means your first visit to the Czech Republic. When and how did the first one happen – and how have your experiences of the country been so far?
I've been travelling to the Czech Republic since 1997, when I interrailed from Germany to Spain, on a very circuitous route. The summers of 1997 and 1998, in both of which I visited the Czech Republic, have a particularly golden hue in my memory, and I almost stayed in Prague for six months in 2001 (until life intervened). I have been back repeatedly since: to Olomouc for poetry workshops, for conferences and readings in Prague, and to Opava for the wedding of an old friend and flatmate of mine, who is from there. The country is always intellectually and artistically bracing; there is a gear-change about being in Prague especially, of feeling oneself dipping into a long current of artistic play and seriousness. Literature *matters* here, to an extent that is not all that common.

Have you come across anything from Czech culture – literature, cinema, visual arts – that has become of particular interest to you?
I am limited, unfortunately, to the literature that has been translated; but in this I have still found some books that have stayed with me for years. The Willa Muir archive is in St Andrews University and her translations, with her husband Edwin, of Kafka's work I've loved since I was a teenager. The poems of Miroslav Holub (who I discovered through Seamus Heaney) and the remarkable novels of Bohumil Hrabal I came to later, and there are a couple of moments in *I Served the King of England* (*Obsluhoval jsem anglického krále*) that still tap away on the edge of my subconscious. I love the films of Miloš Forman too, but also those of Jan Švankmajer – one of the best literary events in Edinburgh, the now-defunct Neu Reekie, mixed poetry, music and animated films, and Švankmajer's work was always a highlight, a mind-bending treat. The tongue being pulled out in *Food* (*Jídlo*) still gives me the shivers.

You gave us permission to reprint your poem inspired by W. A. Mozart's Clarinet Concerto in this issue, which is a lovely touch as Prague is so closely connected with Mozart, and the poem also demonstrates the ability of Gaelic writing to encompass any topic that intrigues the writer. What inspired you to write that particular poem?
The story of the Clarinet Concerto was particularly resonant for me. Not just that it is likely to have been premiered in Prague, but that the manuscript score is lost, and even the instrument it was composed for, the basset clarinet, was rarely played, so the score had to be adapted. There was a metaphor here for loss, and cultural transmission, the way that music (and all culture) can survive in some form, even if not that originally expected: and there was a welcome parallel with the way in which the Scottish Gaelic language exists in the contemporary world, energised by many adult learners. But there were other kinds of loss involved too. I'd just been playing with the Scottish Writers' Football Team in Vienna, where I'd visited the church in which Mozart's Requiem was first performed. And we were absolutely destroyed by the Austrian football team by a score of 9–1. We were terrible: quite a different kind of loss?

It is very hard to make a living as a poet; but it is also very hard to make time to write poetry when doing a full-time academic job.

Your Gaelic poems have already been translated into a number of languages. How do you feel about your work spreading in this way? Do you work closely with translators, or just give them a free hand and hope for the best?
I'm always delighted for my poems to be translated into other languages, especially if they can be done directly, without English 'bridges' – including the translations you did, Petra, into Czech. There is something high-wire and liberating about Gaelic being kept apart from English, and allowed to have ↪

Mozart: Concerto airson Clàirneid, A major, K. 622

Thèid corra rud a chall gu sìorraidh bràth.
Rudan eile, cha tèid. 'S e am pìos

mu dheireadh a chrìochnaich Mozart
Concerto ann an A major

airson clàirneid bassinet – ionnsramaid
a rinn a charaid aig' Anton Stadler.

Chaill esan an sgòr cha mhòr sa bhad,
agus an ceann deichead chaidh a' chlàirneid

aig' fhèin às an fhasain 's à eòlas.
Call air chall. Mozart ann an uaigh

gun ainm ann am Bhienna.
Am pìos ciùil aige na mhac-talla

air ionnsramaid cheàrr ann an dùthaich chèin.
(Ach be dammit, beò, air chrith.)

Mozart: Clarinet Concerto, A major, K. 622

Some things are lost for ever. Some not.
The last piece Mozart wrote

was a concerto in A major
for basset clarinet, an instrument

invented by his friend Anton Stadler.
Who immediately lost the score

and whose instrument went quickly
out of fashion, and then out of lore.

Loss on loss. Mozart in a common,
nameless, grave in Vienna.

His concerto reconfigured,
echoing on the wrong instrument.

(Yes, but still echoing, dammit,
still alive, vibrating.)

There is something high-wire and liberating about Gaelic being kept apart from English, and allowed to have its own conversations with other languages.

its own conversations with other languages, without being overheard or surveilled by that neighbouring language. Many others do require a bridge. That does require a different process, but also has its own pleasures and opportunities – the bridges I give would tend to show just how wide-ranging some Gaelic words would be in comparison to the English; the bridges themselves undermine and pick away at the English. With the translators, I enjoy working as closely with them as they choose; however, I would always give them a free hand in the end, and trust them. I've been lucky to work with excellent translators who I respect for their skill and craft: it would be … foolish to be too controlling.

Petra Johana Poncarová is a Marie Skłodowska-Curie postdoctoral fellow at the Department of Scottish Literature, University of Glasgow, and has been working mostly on modern writing in Scottish Gaelic. Her monograph *Derick Thomson and the Gaelic Revival* is forthcoming from the Edinburgh University Press. She is one of the co-directors of Ionad Eòghainn MhicLachlainn | National Centre for Gaelic Translation and translates directly from Gaelic into Czech, including the novel *Deireadh an Fhoghair* by Tormod Caimbeul (*Konec podzimu*, Argo, 2018). She was the manager of the 3rd World Congress of Scottish Literatures (Charles University, Prague, 2022).

The strategic partnership between Charles University and the University of St Andrews was established in 2020 to support exchanges, joint projects, and other forms of cooperation. At the Faculty of Arts, some of the major outcomes so far have been related to the field of Scottish Studies. Support from the Strategic Partnership Fund has brought Robin MacKenzie and Peter Mackay to Prague and Petra Johana Poncarová to St Andrews; an upcoming special issue of the academic journal *Litteraria Pragensia* (litterariapragensia.ff.cuni.cz) on ecocriticism is being prepared as part of the exchange.

Your academic work has a broad reach, including Irish Studies, but you have been publishing a lot on Scottish literature in general and on Gaelic writing in particular. Scottish Studies and Gaelic Studies are both relatively young and growing disciplines, and surprisingly little work has been done even on some major writers and essential topics. What strikes you as the most important challenge for people working in these fields? What is most needed?

As you say, there is a huge amount of work that needs to be done on even major figures in Scottish and Scottish Gaelic Studies. The political and cultural relationship between Scotland and the rest of Britain is probably behind this to some extent: the comparison with Irish Studies, with the whole weight of a national imaginary and a sizeable North American diaspora behind it, is telling in this way. So, we need the expanding of the canon, critical editions of many authors (Naomi Mitchison is one of the most interesting 20th century novelists; the 18th century Gaelic poet Alasdair mac Mhaighstir Alasdair doesn't have a collected work of poetry solely to his name; the hugely important book of the Dean of Lismore has never been fully translated and edited), and a huge amount more academic discussion. There hasn't been a wide-ranging analysis of contemporary Scottish poetry for almost 20 years. Much good work *has* been done, and the situation is improving, but there is still a need for more debate, more excavation, more play with this rich tradition, and the lively contemporary scene. Does the culture really exist if we aren't arguing about it in cafes, in pubs and in print?

Which projects are currently keeping you busy when it comes to your own writing and academic work?

Well, too many to keep up with – and to imagine finishing any time soon. I'm working on a book of literary non-fiction essays in Gaelic, about Gaelic culture (in the broadest sense) and what it means to be a Gaelic speaker in the contemporary world. I will also hopefully finish a third book of poems next year, with the Mozart poem in it. And I'll be delving into the murky waters of 19th century magazines and newspapers as part of a project to create an expanded sourcebook for the Scottish 19th century. Oh, and judging the Highland Book Prize, which is a real pleasure: books of any genre, connected with the 'Highlands' of Scotland one way or other – there are always great surprises.

The strategic partnership with Charles University is one way for St Andrews to retain and expand close cooperation with an institution on the Continent, even in the aftermath of Brexit. What, in your view, could be the main benefits of it for both universities?

Peter Mackay / Pàdraig MacAoidh was born and brought up on the Isle of Lewis, in the Outer Hebrides in Scotland. He is a poet, broadcaster, journalist, and lecturer. As an academic, he has experience from a number of universities, including Queen's University Belfast and Trinity College Dublin, and has also worked as a broadcast journalist and news producer for the BBC. He is the author of two monographs, *Sorley MacLean* (2010) and *This Strange Loneliness: Heaney's Wordsworth* (2021), and two books of poetry, *Gu Leòr / Galore* (2015) and *Nàdur De / Some Kind of* (2020). In 2022–2023, he held the post of the official bard of An Comunn Gàidhealach [The Gaelic Association], one of the highest honours available in the world of Scottish Gaelic letters. His poems in Czech translation have recently appeared in the magazine PLAV (7/2023, svetovka.cz).

What would you like to see happening within the framework?

Post-Brexit there was the real risk of cultural and intellectual retrenchment in the UK, a turning inwards and depressed navel-gazing, with a celebration of dubious 'British' values and culture. This strategic partnership is a crucial bridge to avoid this, to keep ongoing links between such long-established, and friendly universities, and – I would hope – to raise different questions for each other, bring new perspectives, whether through research trips, joint conferences, student exchanges: there is really no limit to the kinds of joint thinking that can be done.

Apart from your substantial academic record and career in poetry, you also worked as a broadcaster and journalist for the BBC. What did you enjoy about it? Do you miss media work – or is it better just to give interviews to Czech media?

There was an immediacy and urgency to the journalism: responding to world events for a Gaelic audience (I spent weeks covering the war in Libya from a studio in Glasgow); telling stories from the Lowlands and the Highlands to a national audience, without resorting to exoticism; the excitement of the 10-second countdown before going live on TV. I miss all of those, and also the technical work of audio and film editing: I have little time for that in my day job now, and would love to get back into some filmmaking. But I am lucky enough to still be able to do a lot of enjoyable media work: contributing to programmes for BBC Radio 3 and Radio nan Gàidheal, and discussing literature on BBC Alba TV programmes, and – of course – talking to Czech media. It is always a pleasure. Thank you.

A valuable **partnership**

Researchers from Charles University have been involved in exciting joint projects with partners from the University of St Andrews, Scotland's oldest university, as part of CU's strategic partnership. From setting up virtual networks and intensive workshops for early-stage researchers, to investigating climate change impacts, Joint Seed Funding brings together complementary expertise from the Czech Republic and Scotland.

STORY BY Joseph North, Jaromír Soukup, Jan Velinger PHOTOS BY Shutterstock

The year 2023 saw a new call so it was a good opportunity to catch up with joint seed funding winners from the previous year to see how their projects had evolved.

Symbolic borderworlds

Narratives of migration, borders, histories and traumatic memory have rarely been more central than they are today. Professor Kateřina Králová (of the Department of Russian and East European Studies, Charles University) is working with Dr Stavroula Pipyrou (Social Anthropology, St Andrews) to build a cross-disciplinary network of researchers investigating these topics. Professor Králova explains: "Our regular webinar series provides the opportunity to discuss our academic interests, fieldwork and best practice. While our focus is central, east and southeast Europe, the webinars also discuss research projects conducted around the world. Our participants' diverse research topics and experiences enrich our understanding of symbolic borderworlds in a more global setting. [The aim has been] to contribute to the successful completion of PhD students' theses and create opportunities for future collaboration between young researchers, departments and universities."

Medieval

St Andrews and Prague were both centres of the medieval world, known for their great cathedrals, manuscripts and universities. The Medieval Explorations project has allowed early career researchers to handle manuscripts and early books in the University of St Andrews Special Collections. More broadly, the multi-lingual project explores the richness of the medieval imagination and new approaches offered by digital humanities. Over a three-day workshop, Professor Ian Johnson (School of English, St Andrews) and Professor Lucie Doležalová (Institute for Greek and Latin Study, Charles University) brought together colleagues, archivists and visiting academics to create a friendly and challenging interdisciplinary platform for 10 to 20 early-stage researchers to present ideas, ask questions and work directly on medieval materials. With links dating back to 2013, the project leaders hope to encourage early-stage researchers also to enjoy the benefits of international collaboration.

> We are celebrating success – aspects of partnership that have already 'blossomed' and are now being taken to the next level.

Climate change

Home to a world-famous golf course and magnificent medieval ruins, St Andrews contains some of Scotland's most iconic coastal heritage – which is threatened by climate change. Researchers at the School of History at St Andrews, and the Institute of Hydrogeology, Engineering Geology and Applied Geophysics at Charles University are working together to understand this problem, bringing together hands-on knowledge and experimental modelling. Dr Gianvito Scaringi (Charles University) said, "We [are modelling] ground stability and erosion problems at Scottish heritage sites to better assess risks and discuss risk reduction strategies. Dr Tom Dawson and his team are monitoring and working on these sites, they have assessed their vulnerability; we aim to provide statistical and physical modelling expertise. It is a chance to test our models in the real world."

Tomorrow and beyond

In 2023, teams from both universities met in both Scotland and the Czech Republic ahead of the newest call – or second round. Most recently the Czech team hosted St Andrews Day at the Carolinum, welcoming delegates to discuss successes and look to the future. Attendees included Jan Kuklík, Charles University's Vice-Rector for Academic Appointments, and Jaromír Soukup from the International Relations office at CU, while delegates from St Andrews included several members of the school principal's office including Professor Ineke de Moortel, who gave an opening lecture on sustainability. St Andrews has set itself the ambitious goal of being net carbon zero by 2035. Professor de Moortel's presentation was inspiring in the many angles it delved into the issue and the way universities can lead on problems like climate change and make a measurable and real impact.

Both schools highlighted joint-projects already underway in the first call and discussed opportunities for even broader cooperation. CU's Jaromír Soukup: "In evidence is just how many projects have already brought academics from both schools together. Moving forward, we want to extend cooperation and mobility not only to researchers and students but also to administrative staff and members from our different faculties."

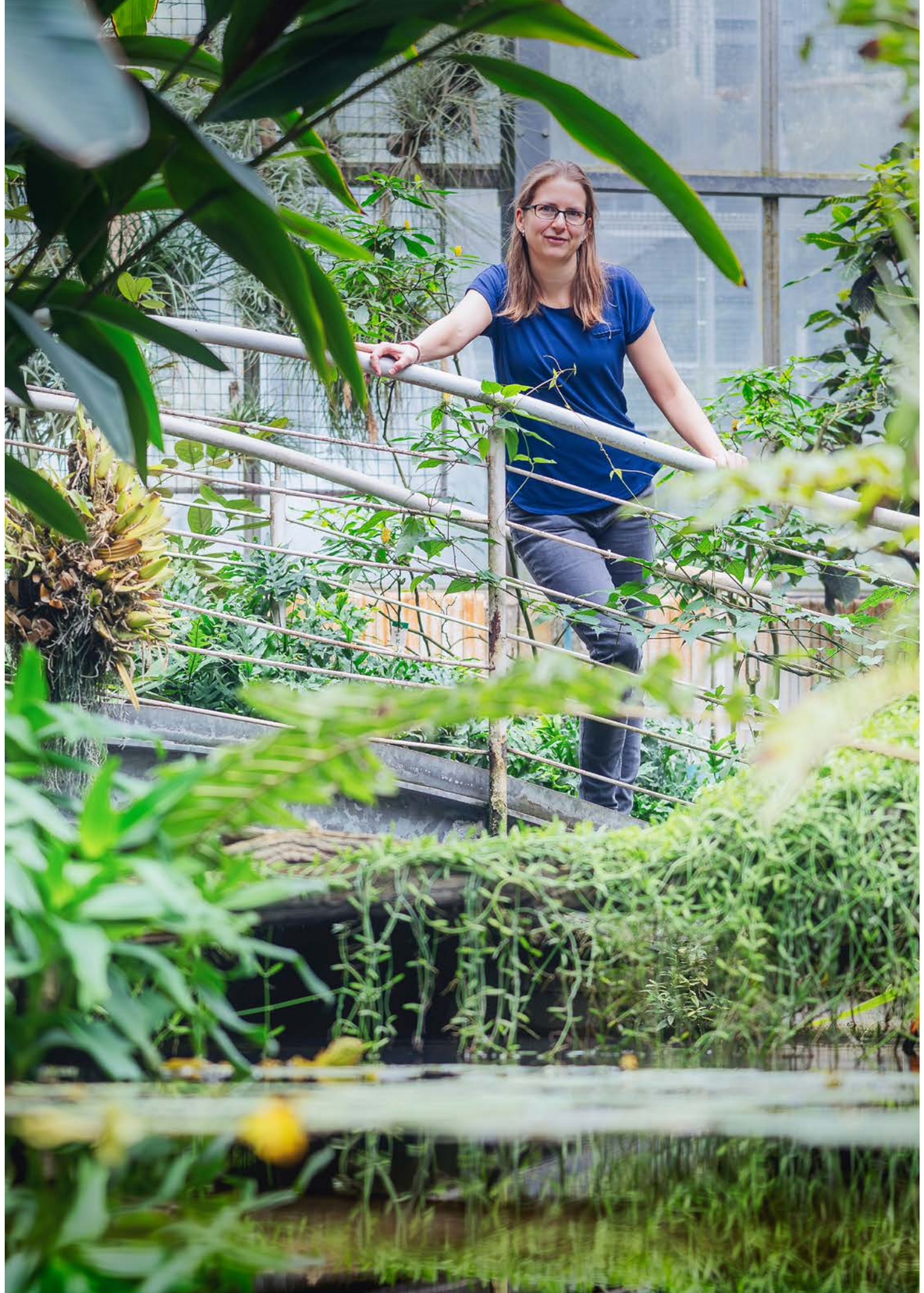
Forum: St Andrews is a smaller and slightly younger university – okay not much younger, founded in 1413 compared to 1348 – but it seems very focused on issues like sustainability…

"It's one reason our rector, Milena Králíčková, asked that sustainability be highlighted and discussed in depth today. St Andrews is at the forefront among British universities on climate change. We are both old schools with historic buildings but we are both building progressive new campuses where sustainability is easier to implement than some of the older historic sites."

Forum magazine also spoke to St Andrews Vice-Principal for Strategy, Ester Ruskuc: "Ancient universities like St Andrews and Charles University, with a similar ethos in education and research, encounter similar challenges and opportunities… We are celebrating success, aspects of partnership that have already 'blossomed' and are now being taken to the next level. We are also looking at how to support emergent collaborations and we are finding out where we can introduce mechanisms to support even more."

This year, additional projects have been supported, covering diverse areas. One of these projects focuses on "Peat Carbon Accumulation across Climatic, Hydrological, and Ecological Gradients in the Greater Amazon Basin." Another addresses "Organising for the Future: Public and Private Approaches to Managing Sustainability." Additionally, a project is dedicated to "Inclusive Community Building through Digital Heritage Preservation in Times of Crisis." Lastly, a selected project delves into "Antigypsyism through Research and Pedagogy."

St Salvator's Chapel: one of two collegiate chapels belonging to the University of St Andrews.



Deep-sea fish **research** hooks ERC grant

“Our primary goal is to understand the limits of what the vertebrate eye is capable of! Most vertebrates have a very similar – evolutionarily conserved – eye structure. It is by studying extremes such as the eyes of deep-sea fish that we can also learn many useful insights about the human eye, or gain inspiration for the design of telescopes.” says Zuzana Musilová from the Faculty of Science of Charles University.

STORY BY Pavla Hubálková
PHOTOS BY Petr Jan Juračka, Luboš Wišniewski

“Fish generally see much better than humans! Moreover, fish are an extremely diverse group of animals: they have evolved a number of ‘oddities’ through evolution. If we were to choose the ten greatest eye adaptations among all vertebrates, nine out of 10 would certainly be fish,”. As a scientist, Musilová is fascinated by research on the sensory organs of deep-sea fish, especially vision. Four years ago, her team discovered a unique set of pigments – rhodopsins – in the eyes of some specimens. They made the cover of *Science* magazine with their surprising discovery.

Now Musilová has been awarded a prestigious *Consolidator grant* from the European Research Council (ERC). In the current round, her classmate Matyáš Fendrych, who is researching the plant hormone auxin, was also successful – more on page 16 in this issue.

“In the ERC project, we want to build on our previous results and find out exactly how it works – how deep-sea fish see. Thanks to recent advances in technology, we can now sequence RNA at the level of individual cells, which will allow us to study individual light-harvesting cells in the fish eye,” the evolutionary biologist explains.

What is it good for? “Our primary goal is to understand the limit of what the vertebrate eye is capable of! We can learn many useful things about the human eye and more,” citing a number of examples where past research led, for example, to the use of a chemical from deep-sea fish for the experimental treatment of glaucoma. The method of coping with high eye pressure seems to be universal. At the same time, the successful ERC grant holder admits that, although it may seem very unlikely at first sight, her research may one day have biomedical applications, even if this is not the primary aim. “Our goal is really basic research – to understand the nature of how eyes work. But you never know if your findings won’t someday lead to practical application,” she says.

Do fish see in colour?

What do we already know about fish vision? “Fish generally see in colour and can usually see better than humans. Most mammals have only two colour channels, humans are better off – they have ↪

three – red, green and blue, but fish have four or five and can see in the UV spectrum, for example, or are able to distinguish much more detail in the blue and green spectrum. But we don't know much about how deep-sea fish see exactly," says Musilová, who is endlessly fascinated by the various adaptations of fish eyes to deep-sea life.

"Deep-sea fish have had to adapt to be able to detect photons more than six hundred metres below the surface, which are already very rare at such depths. This makes them better able to find food, mates or avoid predators," the scientist explains. In addition to morphological adaptations such as large eyeballs or eyes that look like telescopes, these fish also adapt at the cellular and molecular level. "We've known for decades that some species, for example, have multiple layers of light-sensitive rod cells on their retinas that allow black-and-white vision. Other groups have extremely long rods. Some of the fish groups we are focusing on have several different rod rhodopsins, which could theoretically allow colour vision. We are interested in whether deep-sea fish can see in colour and, if so, how," says Zuzana Musilová, outlining two possible hypotheses.

"One possibility is that they can actually see in colour and are able to choose their prey according to preferences. Like the human eye, which sees in a colour spectrum from violet to blue, green, yellow and red, these fish could distinguish shades from dark blue to light green, for example. The second hypothesis is that they are not able to distinguish colours, but can detect light intensity across the whole colour spectrum," says the scientist, who would like to know the answer to exactly how this works at the end of the five-year project. "In a previous publication in *Science*, we described something new, but we didn't know what the molecular mechanism was at the level of the individual cell-targets. Now we want to understand that! It may sound like a small step, but if we can clarify that it's either colour vision or, conversely, a kind of 'super-vision' regardless of wavelength, then in both cases it will be totally unique among vertebrates," she explains.

Sharing fish

The uniqueness of the project is the combination of state-of-the-art methods, unique designs and the basic human desire for knowledge. How does such research work? "The vast majority of the time I sit at the computer and analyse the sequencing data. Some of the work – preparing samples for sequencing – is also done in the lab, but I don't get there much these days and most of it is done by my handy students. The rarest and most important part is the field part of the research – catching fish at sea," says the scientist, who usually goes on expeditions in collaboration with other research teams.

"It's extremely exciting – you never know what you're going to catch," she explains. The spoils are then divided up fairly. "It depends on which teams we meet on the boat – they are often interested in invertebrates or other species, for example, but we have shared eyes," recalls the scientist, who also admits that sampling will be one of the challenges of the project. "We have already collected some species, but beyond that it will depend on what we manage to catch – it's still field research, which carries a huge amount of uncertainty, but as biologists we have to take that into account," she confirms.

How do you know the function of the eye from the genes? "The problem with deep-sea fish is that we can't study them directly, we can't do experiments mapping their behaviour, so we focus on DNA and RNA analysis," the scientist says. The advantage is that the structure of vertebrate rhodopsin is very well studied and which mutations affect the structure and therefore the ability and sensitivity of colour vision are known. This makes it possible to model and predict rhodopsin function even in animals that cannot be studied directly. "We are interested not only in the order of amino acids – the information in DNA – but also in the level of gene expression, or how much of which gene is used, which can be determined from RNA molecules," the evolutionary biologist adds.

One possibility is that deep-sea fish can actually see in colour and are able to choose their prey according to preferences.

Zuzana Musilová, PhD, comes from České Budějovice. She studied zoology at the Faculty of Science of Charles University. She did her dissertation at the Institute of Animal Physiology and Genetics of the Czech Academy of Sciences in Liběchov. Subsequently, she spent four-and-a half years in Basel, Switzerland on a postdoctoral fellowship with Professor Walter Salzburger. Since 2015, she has been working at the Department of Zoology, Faculty of Science, Charles University. In 2020, she won the L'Oreal Prize for Women in Science and in 2021 she won the Neuron Prize for Promising Scientists in Biology.

Don't mess up the preparation

"I made my final submission of the grant in my postpartum period, which was possible mainly because of the fair division of care for my daughter with my husband – also a scientist. And thanks to workshops organised by the Technology Centre of the Academy of Sciences, I had already written the project six months earlier. This is very useful because then you have enough time to improve it," says Zuzana Musilová, who appreciates the feedback she receives. "The whole preparatory process is extremely useful for us applicants – from the beginning you get valuable feedback from people who have already received an ERC grant, been interviewed or been on evaluation panels. This helps you to rethink your research direction and what you want to focus on, but also to choose the right way to communicate," the successful applicant says in summary, stressing that a good idea is not enough! "Careful crafting is just as important as the research question itself, and perhaps that is what determines the success of an application, because in the second round you are already meeting other applicants who all had good ideas."

Did she also use the services of experts in presentations or rhetoric? "No, no! That was a line I didn't want to go beyond. A colleague from Germany even told me that they hired agencies to do it, but I wanted to maintain authenticity and prepared the presentation myself. But I did a lot of editing just based on feedback from colleagues," says the scientist, who thought about the ERC project for more than a year. "Then when you start writing it up, a lot of things become clearer – for example, I found that my initial idea was too broad and would have been a bit of a mishmash. It was also thanks to workshops and feedback that I decided to go for a simpler storyline," Zuzana Musilová recalls. Her recommendation for others: leave enough time for preparation and don't slack off!

Exploring the **Auxin** Phenomenon

“We previously described rapid auxin speciation in the root of a model plant *Arabidopsis thaliana*. Now we want to focus on this in other parts of plants, bringing us closer to practical applications,” says Matyáš Fendrych from the Faculty of Science.

STORY BY Pavla Hubálková PHOTOS BY Petr Jan Juračka

“Auxin is a phenomenon of plant biology – it plays an absolutely central role in regulating plant growth and without auxin there would be no plants as we know them today,” says plant biologist Matyáš Fendrych from Charles University. The scientist recently succeeded in elucidating the so-called rapid auxin response in the root of the model plant *Arabidopsis thaliana*, which serves, among other things, to enable plants to grow quickly through the soil and orient themselves well.

“We now want to find out whether this response is a ‘specialty’ that has evolved in the roots of this plant or whether it is a more general process that also takes place in other parts of the plant and in other species such as grasses,” Fendrych says and, recently awarded a prestigious *Consolidator grant* from the European Research Council (ERC) to carry out this project, he is in a good position to find out. This is his second ERC grant, having been successful in the Starting category in 2018. His “classmate from the university” Zuzana Musilová, who is investigating how deep-sea fish see, also succeeded in the current ERC call – more in a separate article on page 12 in this issue.

“The fast auxin pathway is a hot trend in plant biology at the moment – other teams in Austria, America, the Netherlands or France are also researching it, but they are all focusing on the Arabidopsis root. We want to focus on plants more generally because we think it is a much more universal phenomenon,” says the leader of the new MORpH project, who also reveals the second part of the research question.

“We also want to focus on how plants affect the shape of their cells – morphogenesis – through acidification of cell walls, or changes in pH, and how much this is related to auxin,” says Fendrych, adding that although this is basic research, the addition of the grass model, from which many crops such as grain are derived, will bring them closer to the possible use of the findings in practice.

The main challenges? Microscopy and people

What would Matyáš Fendrych like to be known for in five years, when the project will wrap up? “I would like us to do the best microscopy and be able to observe cellular processes in detail at high temporal and spatial resolution, not only in the roots of the Arabidopsis, which we do and is relatively easy, but also in other developing organs and other plants – that will be a challenge,” is his reply. The scientist, whose team has a special vertical microscope combined with spinning disk technology that allows them to observe plant growth in its natural, i.e. vertical position, and also “live” because the spinning disk allows for very fast scanning.

“Perhaps an even bigger challenge will be to find the best people and attract them to Prague to join the project,” Fendrych says, stressing that people are his priority now and he wants to help young scientists reach their full potential.

Presenting in front of his children helped him prepare

“I prepared long and intensively. In general, I was very nervous about it for a long time because I was aware that the future fate of my lab depended on it – what projects we will be able to work on, whether I will be able to hire new people and so on,” says Matyáš Fendrych, for whom this was his second ERC experience. How was it different? “I didn’t have to go to Brussels for the interview, but it was all done online via videoconference, which has advantages, but it was also a source of additional stress to make everything work,” says Fendrych, who practiced the presentation in front of his colleagues at the faculty, but also during the preparatory “mock interview” organised by Zdeněk Strakoš. “They ‘harshly criticised’ my presentation there, but thanks to their feedback, I redid the whole thing and I think it helped a lot,” says the successful applicant, who also benefited from practicing his presentation in front of a non-traditional audience. “The night before the interview, I gave my presentation to my young children, who don’t speak proper English yet and couldn’t understand it at all. However, they were intrigued by the pictures of growing roots in the presentation and shouted with laughter. I didn’t get discouraged and continued with the presentation, reassuring myself that tomorrow would be easier. And it was!” Fendrych has the following advice for anyone who wants to apply “Try it! ERC grants give amazing freedom and, curiously, have a higher success rate than many other grants.”

Matyáš Fendrych, PhD, studied biology at the Faculty of Science of Charles University and now runs a research group there. He received his PhD from Professor Viktor Žárský at the Institute of Experimental Botany of the Czech Academy of Sciences. He worked as a postdoctoral fellow in the laboratory of Moritz Nowack at the VIB Institute in Ghent, Belgium, and with the Czech experimental botanist Jiří Friml at the IST in Austria.

A real **team** leader

She is an internationally recognised Czech scientist and recently became the first woman to receive the Czech Head Award. Professor Zuzana Moťovská received the government's top scientific prize for 2023 for her outstanding contribution to the field of cardiology.

STORY BY Marcela Uhlíková PHOTOS BY Michal Novotný

Most days, you can find Professor Zuzana Moťovská at the Cardiac Centre of the Cardiology Clinic of the Third Faculty of Medicine of Charles University and the Královské Vinohrady University Hospital. As part of the team in the Division of Acute Cardiology, she treats patients with cardiovascular disease, including myocardial infarction, heart failure, pulmonary embolism, and arrhythmia. Medical students from the Third Faculty of Medicine regularly visit her at Hall S, as did *Forum* magazine.

Professor, what kind of impact has receiving the *Czech Head* had on your work?
I have given it some thought, and I think it has been beneficial. Thanks to the award, I will be able to show the broader public positive details about my workplace and the role we play. In the past, for me, gender was not really an issue, and I never thought about the limitations of being a woman in this type of work. I myself don't care whether my co-workers are female or male when I am interviewing them for a job. What matters are completely different criteria: their relationship with patients, knowledge, personality, whether they are hardworking. However, if my success can show up-and-coming female scientists the way, that it is possible to combine a career with parenthood, I will be happy. I am extremely pleased with the interest I have received since getting the prize – I really appreciate it.

Did you expect the surge in media interest?
I definitely don't want to become a media star. But I can say 'No' if I have to.

How hard is it to do good science? Is it easier abroad?
When, like me, you do clinical research at a functioning clinic, it's always more challenging than if you were part of a purely scientific institution. But I have never felt the need to compare and claim that it might be better elsewhere. I make demands on myself rather than the place I work. I often ask myself: have I done everything for my team, did I use all the available grants, did I work enough and with enough inventiveness, could I have done better?

To come back to your question: it's good to know how they do things in other places. Thanks to my specialisation, I've gotten to know quite a few foreign departments and to work with doctors from abroad. I certainly wouldn't claim that science is easier abroad. On the contrary, I would say that the environment for clinical cardiology research in the Czech Republic is exceptional and favourable.

We are in the clinic which has ties to the Third Faculty of Medicine of Charles University. I know your "relationship" has lasted more than 20 years. You must be very pleased...
The fundamental thing that inspired me in working at this clinic is that here one can realise one's ideas. ↪

As far back as I can remember, there were always conditions here that encouraged anyone with initiative to come up with good projects.

Was this the influence of Professor Petr Widimský, who recruited you from the University Hospital in Bratislava?
Absolutely. And Professor Widimský, the head of the cardiology clinic and head doctor of the centre, hasn't changed. Often it is a particular patient who inspires me to look for new ways of treatment and to try to improve the prognosis of patients. I consider the fact that I decided to leave Bratislava more than 20 years ago to come here to be a crucial moment on my professional journey.

What about Czech attitudes? Did anyone ever make you feel out of place?
No, only once did I notice small hints that I should do something to improve my Czech when I was in the office. I feel very comfortable here and I find the cooperation with colleagues across the Czech Republic exceptional and supportive. This is evidenced by the collaboration on numerous clinical research projects. In the end, all cardiac centres are largely involved in projects that I initiated.

What is your team like and who are your closest collaborators?
My core colleagues include both senior physicians and the so-called "rotating" junior team. Our support in caring for patients on the three coronary units is provided by the nurses, in my case principally the station and section nurses. Without their support and work, I could not imagine carrying out clinical research projects.

How do you attract new colleagues to work with you?
This might be a question for them. Acute cardiology, which I am involved in, requires rational judgment from the physician even in tense situations, and you can't fake it. Respect must be earned. I hope this doesn't sound presumptuous to say, but I think I can motivate my colleagues and get them excited and enthusiastic and draw them towards a common vision. Teamwork is important to me. We complement each other and solve individual cases. As a team leader, I always try to ensure that there is a good atmosphere. I like my teammates and I am a team player myself.

"I'm very comfortable collaborating with my team members. When there's a problem, we try to solve it together. I'm pleased we can do good work together," says Professor Zuzana Moťovská. From left: Dr Jaroslav Ulman, Kateřina Pilíková – section nurse of the coronary unit, Denisa Odvodyová – station nurse, Professor Motovská, Dr Martin Kozel, Dr Karolína Poledníková.

In 2018, I had the opportunity to talk to you about the important Prague-18 project for the treatment of patients with myocardial infarction. What was the outcome?
The published results of the project, which compare the efficacy and safety of two treatments based on two drugs – ticagrelor and prasugrel – have to date more than five hundred citations and are referenced in all relevant global guidelines for the treatment of patients with coronary artery disease. Great respect is owed to all those involved in the project in the Czech Republic, from doctors to nurses to patients. Now, after five years, we are going to evaluate the long-term results; I believe that we will gain knowledge that could be repurposed. At the end of this year, we will finish recruiting for a large international multi-centre study, the organisation and implementation of which has been the most difficult, most challenging in my professional research endeavours so far. I very much hope that it will provide new and important insights for the treatment of cardiogenic shock, the most lethal complication of acute myocardial infarction.

In addition to being a scientist, you are a doctor and a teacher. Which profession occupies you the most?
I am mainly a doctor: the patient is central to my work and, as I said, the inspiration for my interest in everything else. Clinical research runs parallel to patient care and medical education, which also means an extra amount of work. Medical students are also a source of inventive thinking. I like their reasoning as long as they use logic and it makes sense. It's important not to put up barriers in this regard, to let students think and look for answers on their own and not just memorise what they have learned.

Apart from medical students, I also supervise PhD students, and I have just "launched" one PhD student into the world. As part of her stay at the prestigious cardiology clinic at the Leiden University Medical Center in the Netherlands, we are preparing a collaboration that I am looking forward to. Cooperation with excellent partners enhances the quality of our research and paves the way for more shared projects. I simply try to cover all three areas according to the current needs of the department. As the saying goes: everything is connected.

Is cardiology an appealing choice for medical students?
Absolutely, yes. In general, medical students are interested in everything. During their internships at our clinic, they often decide to come to our department for a reason: they are intrigued by the field, they like the way we do things, they appreciate the relationships we have here, or perhaps they identify with the broad opportunities that cardiology offers.

Professor Zuzana Moťovská comes from Bratislava. After studying general medicine at Comenius University in Bratislava, she worked at the Bratislava University Hospital: first in geriatrics, then in the intensive care unit. Since 2016, she has been a professor of internal medicine at Charles University.

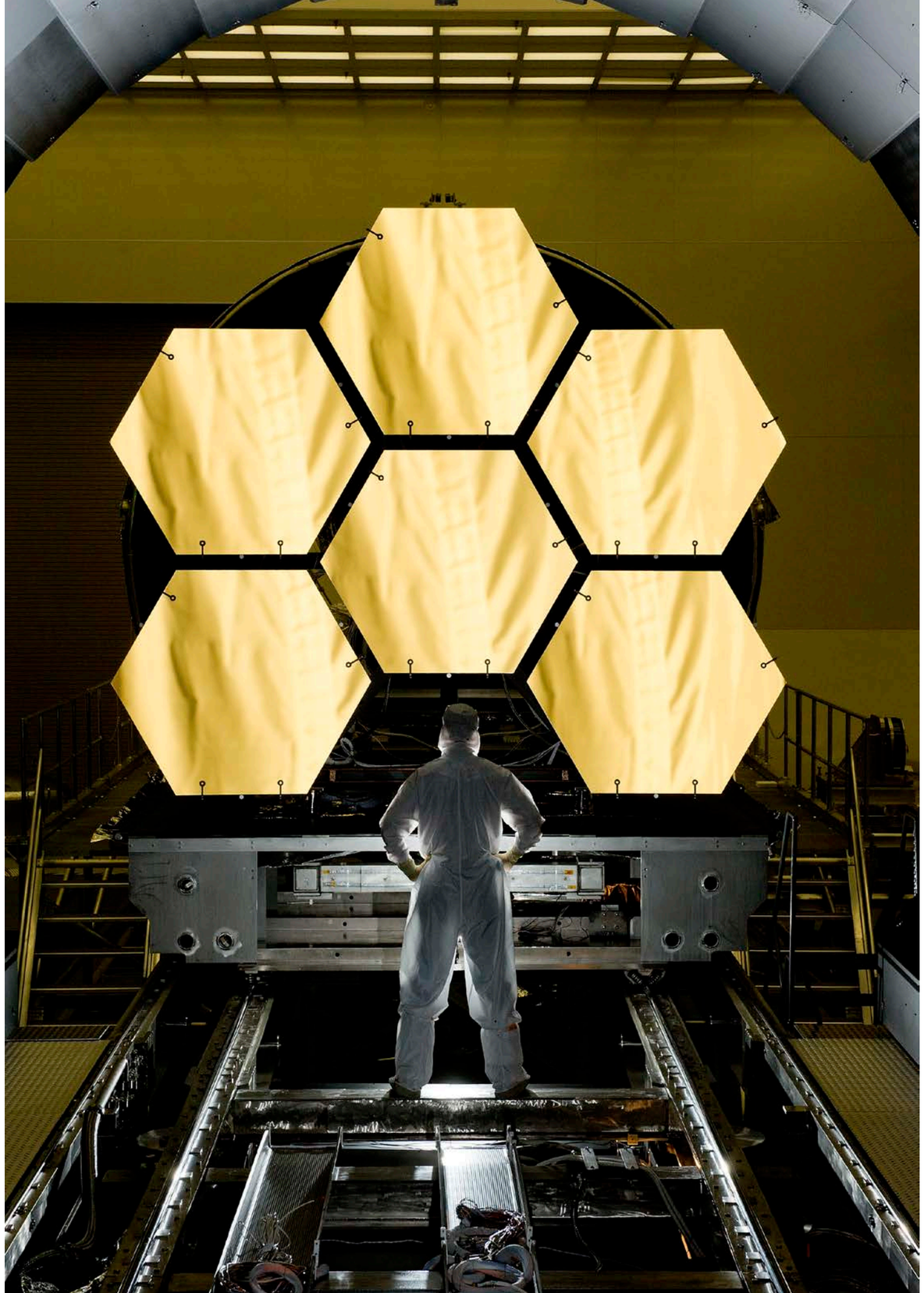
In 2005, she joined the Cardiology Clinic of the Third Faculty of Medicine of Charles University and the Faculty of Medicine of Charles University, where she heads the Division of Acute Cardiology. In 2019, she received a *Donatio Universitatis Carolinæ* research grant at CU.

She has extensive scientific collaborations with the most prestigious research institutions in the world including Harvard Medical School, Heidelberg University, and others. Moťovská is an internationally recognised expert in cardiovascular disease, coronary artery disease, atherothrombosis, and atherothrombatotic therapy. As a principal investigator, she is a signatory of a number of multi-centre randomised trials focused on the treatment of coronary artery disease (Prague-8, Prague-18, Prague-23), and her research results are presented annually at the world's most prestigious cardiology conferences.

What challenges are you facing next?
As soon as I finish my interview with you, I have a conference call with colleagues from other departments. I'm thrilled about how excited they are that we have more work to do together – the feeling is beyond words! For one thing, we are just finishing the international Prague-23 study, in which we were joined by five sites from abroad, and it was very difficult to conduct because it followed unstable patients in cardiogenic shock. To give you an idea: one in two of these patients die – most while still in the hospital. At the same time as evaluating it, we are launching a new project, again international and interdisciplinary, on which we will be collaborating with other specialists from cardiology centres.

How important has support from different areas in your life been?
Without support, I would never have achieved anything. I have a very tolerant and well-grounded husband who provides tremendous support and understanding. He is also a doctor, an anaesthesiologist, so he is no stranger to my working environment. I always wanted a partner who was smarter than me, and I succeeded. That is why I have been able to soar – or fly – in life as I have (smiles).

As a team leader, I always try to ensure that there is a good atmosphere. I like my teammates and I am a team player myself.



The Czech contribution to NASA's **JWST** mission

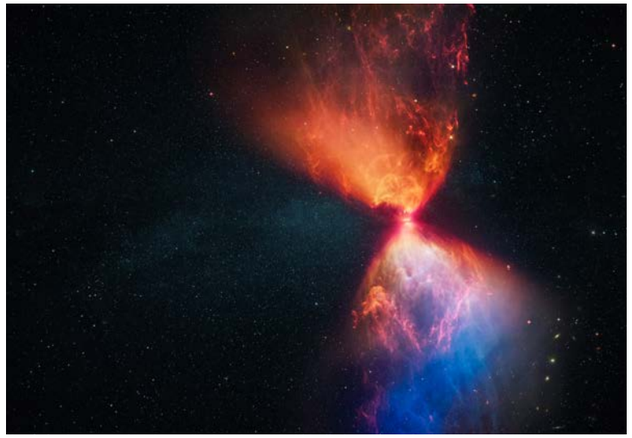
Two years since it was launched into the L2 Lagrange point, 1.5 million kilometres from Earth, NASA's James Webb Space Telescope has proven to be an overwhelming success. Designed to help scientists study the formation of galaxies in the early universe, the infrared observatory stunned viewers from the get-go with images of unparalleled precision. It revealed galaxies only a few hundred million years younger than the very universe itself. Space.com succinctly surmised that the telescope had "blown astronomers away".

STORY BY Jan Velinger PHOTOS BY Vladimír Šigut, NASA, Shutterstock

The development of the JWST, as the observatory is called for short, was led by NASA and took some two decades – involving the work of engineers, scientists, and technicians from dozens of countries around the world. One scientist who made a major contribution was Charles University's Günther Kletetschka, a geophysicist and expert on magnetism at Charles University's Faculty of Science.

Striking images

His international team developed an elegant system: a magnetic arm for use with one of the telescope's four major instruments: the Near Infra Red Spectrograph (NIRSpec, designed to open and close 248,000 microshutters just 100 by 200 microns in size – the width of a few human hairs – to transmit or block light. Using the microshutters, the telescope is able to capture the spectra of 100 individual objects in space – all at the same time. *Forum* caught up with the researcher to learn more about the team's contribution. "We worked on the problem from around 2002–2008. That was when we arrived at the final product. But there were still many parts of the telescope that required completion, so it was a while before the JWST was ready for launch in December 2021. I had three specific grants that funded my research in this area. The purpose was to make the best possible system of arrays for the telescope." ↪



Spectacular images from NASA and the JWST. From above: the Carina Nebula, the birth of a star, and the Orion Nebula – a diffuse nebula situated in the Milky Way.

An 'open and closed' case

Kletetschka describes each microshutter as a tiny shoebox lid that is either flipped open by the magnetic arm or flipped shut, releasing the voltage holding the shutters open.

"It's a tiny door in the order of 62,000 per array, of which there are four, so some 248,000 in all. Once closed, light cannot go in, but you use a magnet to sweep a magnetic field to create magnetic torque. From the perspective of the microshutter, there is a magnetic field rotation around the microshutters. The rotating magnetic field lines create magnetic torque, acting on the microshutters, allowing their rotation on their silicon hinges. Once the microshutters are half open, the electrostatic force swings all of them completely open and holds them until the program decides which sets of microshutters should be closed, allowing only the light from specific objects in space to come into JWST analysors."

Testing, testing... The backbone of any scientific endeavour

In his office in the basement of the Faculty of Sciences at Prague's Albertov, which gives the impression of organisation and clutter at the same time, Kletetschka showed us the original dipole magnets he employed to create the rotating magnetic fields. NASA had originally had an engineer produce a hexapole magnet as a precursor to the system, which the scientist says were six dipoles glued together.

"They had to be very close to the shutters, too close, which proved impractical. The distance of the magnet was just 0.2 mm. It was too close and it led to crashing often into the shutters that damaged months of work by a great many people. And I realised it was not the strength of the magnet but the torque that was important. Once we focused on that, it became possible to locate the magnet not 0.2 mm but a full 2.0 millimetres away. It appeared this would work and that things were on the right track.

"What we also realised was that once the microshutter opens, there is a wall in the shoebox that is electrostatically charged, and this opposing charge makes the box stay open. The problem began when the dipole magnet returned to 'parking' position; the magnetic field was so strong that the box remained partly open. So we needed the magnetic field to be swept away much faster, and the answer was to opt for a quadrupole magnet. Once we made that, everything worked. And that is what is on the JWST now."

Material fatigue

As is the case in most any scientific endeavour, one problem solved led to new questions that needed answers before the project could take another step nearer to completion. Testing the microshutters revealed other shortcomings: material fatigue. Günther Kletetschka again:

"We needed to see how many times the shutter could open and close, before the hinge, made of silicon oxide, failed. We tested the hinges over and over and then saw, after say ten thousand tries, that a hinge broke. That is material fatigue. You can't have a hole there, so we had to create a little fix that could be done even in outer space. The hinge is attached in two places, and you can break one or the other, and the door becomes slightly crooked or stuck. So you have to have a system on board that can re-glue it. Don't forget that each microshutter is 100×200 microns. If a fly takes a tiny poop on the window, that's about the same size."

It is also one thing to consider conditions here on Earth – and entirely different conditions in space.

"There are big differences, of course. We already talked about the magnet. We tested all kinds of materials and opted for this rare-earth element called neodymium. We purchased pre-made magnets from a compressed powder of neodymium, iron, and boron. We started testing it, and then thought, for now we are testing this at room temperature. But is it going to be room temperature out in space? Of course not! Maybe it will be a little lower, like around 50 Kelvin, which is around -223 Celsius! So it's cold.

"Once we reached about 80 Kelvin, the magnet began to fail and lose strength. And everyone began to panic! Nobody knew what to do next! But next to neodymium on the Periodic Table, you have praseodymium, so we repeated the process and redid the magnet using that, and we tested it, and it actually *gained* in strength the lower the temperature got. So the magnet on the JWST is praseodymium, boron, and iron.

Using the microshutters, the telescope is able to capture the spectra of 100 individual objects in space – all at the same time.

In a vacuum

"The next thing was testing in a vacuum; there has to be protection against radiation because you can have ions that are speeding out in space, causing what is called 'reconnection'. Magnetic fields in space, in galaxies and the Sun, can see ions of hydrogen or helium speeding by at a fraction of the speed of light, and they can do a lot of damage, so we had to take steps against that.

"We also examined the microshutters – as such – at extremely low temperatures. At low temperatures, there was a tendency for them to become bow-shaped. Because they are not just one material, they are silicon oxide and you have this conductor, aluminium, that is glued and sandwiched on, and the materials contracted in different ways. We had to work out that issue as well because it was clear it would be operating in extreme cold.

"We tested the arrays in the lab at the Goddard Space Center in Maryland, again and again. We created more than a hundred of them in order to choose the best ones in which the microshutters opened and closed without the slightest problem. We even tested the arrays underwater to see how the system would react."

Science Forum 12

Although many people were involved, the basic team was quite small – Kletetschka along with Tomoko Adachi and Vilem Mikula (the latter also from CU) on board. But Kletetschka says he liked the nature of the work.

There is always a solution

As is probably clear by now, over a five-year period, there were plenty of moments when the scientists hit snags or hurdles, sometimes leaving Kletetschka wondering whether their entire approach would need to be scrapped.

"There were problems we uncovered, and at a certain point, yes, you wonder whether you are going in the right direction. There were moments I questioned whether magnets were a good idea at all! As in, 'Magnets?! What was I thinking!' But even setbacks or failures have their merits. At one point, we began to consider an entirely different approach – not using magnets at all. We began to run electrostatic tests where we saw if we used a certain frequency, we could wobble the microshutters to open and close. And we saw results. There is now testing underway using resonance-related electrostatic fields in a new generation of microshutters. It is about approaching problems in a new way, and that may result now in a different set of products."

To return to the JWST, NASA prefers to call it a *successor* rather than a *replacement* for the famous Hubble telescope that is still in use. With a larger mirror, it is able to look back further across time than any instrument before it – one reason the data already gathered about early galaxies has been so remarkable. A discovery announced in February 2023 revealed the existence of six massive galaxies not thought to be possible at that early stage of the Universe's existence, i.e., the Dark Ages. New data may test everything scientists thought they knew about the creation of galaxies before, as evidenced in a brief interview on CNN with American astrophysicist and science communicator Neil deGrasse Tyson.

He told the station these kinds of discoveries were "exactly what the JWST had been designed to do" adding that we "shouldn't be surprised to be surprised."

From the moment it went into operation, the JWST has gone from strength to strength with astonishing images from around the universe: the Pillars of Creation dust clouds which are part of the Eagle Nebula, the Taurus star-forming region, Pandora's cluster 3.5 billion light years away, the auroras at Jupiter's poles, the dwarf galaxy Wolf-Lunmark-Melotte. There isn't any doubt the JWST will continue to redefine how we see the universe for many years to come. Kletetschka is understandably proud of his contribution, even if his focus has since moved on to areas like undersea geology.

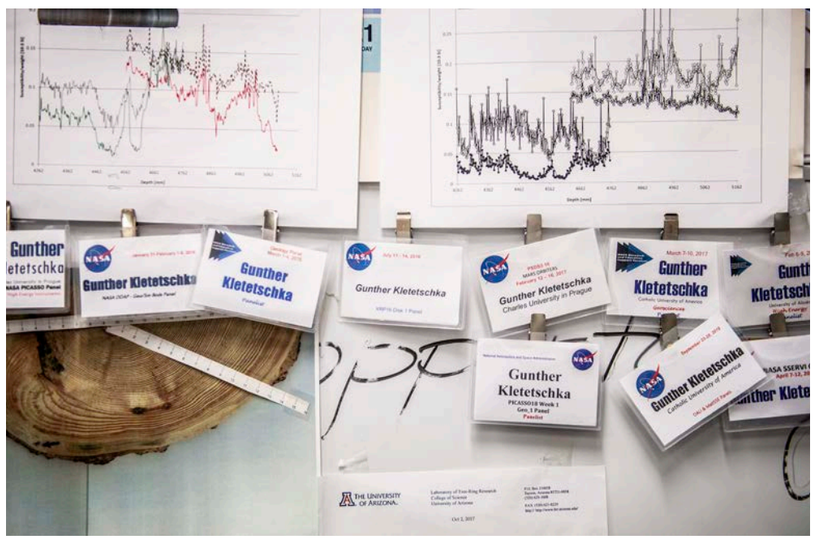
"Suddenly you can see through all the space dust and fog. It's like suddenly having X-ray vision: that aspect of uncloaking this unknown world was the most striking aspect for me. You can aim the telescope at really unknown parts of the universe and see all these different galaxies that are very far away. And their red-shift tells you how far. The device allows you to block off sections you are examining for further analysis. There are still a lot of mysteries to be solved."

Immortality

Günther Kletetschka is quick to point out that space technology often exceeds expectations, and devices and instrumentation often outlive their "shelf life" and continue to deliver long after anyone expected. The Mars Rover and its helicopter Ginny, or Voyager 1 and 2 are cases in point. Voyager 1 and 2 remain the only manmade objects to have left the Heliosphere and to have reached interstellar space, yet are still transmitting to Earth from 24 billion kilometres away! Voyager I left Earth in 1977! When it comes to space and human ingenuity, there are plenty of reasons to cheer. And, as it happens, Kletetschka has a personal connection to those famed interstellar devices.

"Norman Ness, the principal investigator on Voyager 1 and 2, was my mentor. He was from Delaware University, and there was an institute there where he was looking for funding for half a year. At the time, I was working on Mars missions, and I got to work closely with him. I always thought how cool it was to design instruments and send them out into space. Once you launch them into space, they become immortal.

"Yes, there is radiation, and some of the instruments stop working, but still: it's in space, there is no weathering, these spacecraft will still be out there in a million years, very much unchanged! That's so different from everything down here, on the ground. If you look at the computer on my desk, it will look different in 10 years. People want to guarantee that the objects in space will work for 10 years, but the fact is so many are made so carefully, so uniquely, they will operate far longer than that. We often get much more mileage than we expected. For me, that's the foam on the beer!"



Kletetschka's NASA name tags hang alongside charts and other items on his basement office wall.

Associate Professor Günther Kletetschka studied geophysics at the Faculty of Mathematics and Physics of Charles University in Prague and geology and geophysics at the University of Minnesota in the United States. He worked at NASA for 13 years and played a key role in the development of the magnetic microshutter system on the James Webb Space Telescope or JWST. His research interests at the Faculty of Science of Charles University, and the Geophysical Institute at the University of Alaska Fairbanks include the magnetic properties of impact craters, ice and living organisms. He also works on paleomagnetism, has researched the evolution of Mars, and looked at problems and applications of carbon nanotubes. He has also been involved in undersea research.

Invasive plants have **spread** all around the globe

Biologist Petr Pyšek is the proud holder of a prestigious Czech Head Award. He received the award, recognising his life's work, in 2022 for the study of invasive organisms. "Invasive ecology is a field that examines how humans spread plants and animals around the world and what their impact is on nature," he explains.

STORY BY Marcela Uhlíková PHOTOS BY Vladimír Šigut, Wikimedia Commons

Petr Pyšek is a co-founder of modern invasive ecology, the creator of the global database of invasive plants, and the author or co-author of hundreds of articles in expert journals. He has received numerous awards and is currently one of the most cited invasive biologists in the world. Students at Charles University can run into the scientist either at the Faculty of Science or at the Botanical Institute of the Academy of Sciences of the Czech Republic in Průhonice near Prague, where he heads the Department of Invasion Ecology.

Is it correct to say that modern invasive ecology is about more than "a thistle transported accidentally in someone's clothes to the other side of the globe"?

It is: there are of course studies about how non-native species ended up in Antarctica on hikers' clothing. It might sound like a mere curiosity but it illustrates the fact that nowadays invasive plants can be found practically everywhere. Simply put, invasive ecology is a field that examines how humans transport plants and animals around the world and the consequences it has for nature. We're interested in who, when, how and why, as well as how often, these organisms were introduced into the environment.

To understand invasions, it's necessary to look into the past because what we see today is the result of processes that began decades or even centuries ago. We need to understand species and their populations, including their characteristics and responses to changing environmental conditions, but also where they invaded and where they are native, where they originated. Therefore, it's essential to understand related aspects of human behaviour because those too are crucial for invasions. Only when all these pieces come together can we make reasonably reliable predictions about the potential dangers posed by the introduction of plants and propose practical steps to manage them.

Where did invasions begin?

The origins of invasions can be traced back to the heyday of colonial powers when people brought their animals and favourite plants, especially crops, to newly discovered or conquered territories. They wanted to feel at home. Today, we talk more about invasive science than just invasive biology or ecology because we rely on a wide methodological apparatus, which, in addition to biology, also includes social and economic sciences. It's exciting trying to find common ground, especially when different fields often speak different languages.

You must enjoy writing... you are the most cited invasive biologist in the world.

I do, but even if I didn't, I would still consider writing a duty. Doing things just for pleasure and not publishing them is too costly for science and we are paid, after all, from public funds. Our most cited article to date is from 2000, where we described ↪

Professor Petr Pyšek is a graduate of the Faculty of Science of Charles University. He studied geobotany at the Department of Botany and heads the Department of Invasion Ecology of the Botanical Institute of the Czech Academy of Sciences, which he founded in 2004, and also works at the Department of Ecology of the Faculty of Science of Charles University. He is one of the founders of modern invasion ecology, a co-author of the conceptual framework of invasions and classification of the invasion process, and co-founder of the global database of invasive plants GloNAF (Global Naturalized Alien Flora).

the conceptual framework for invasions, proposed a classification of the invasion process, and terminology. Thanks to the acceptance of our approach by the scientific community, standardised data collection on invasions began. About a decade later, we were able to start building, with seven colleagues from Germany, Austria and the UK, the global database of non-native plants, GloNAL (Global Naturalized Alien Flora). I deliberately created this acronym to resemble the name of a Tolkien dwarf. Gloin sounds the closest but in fact, no such dwarf exists.

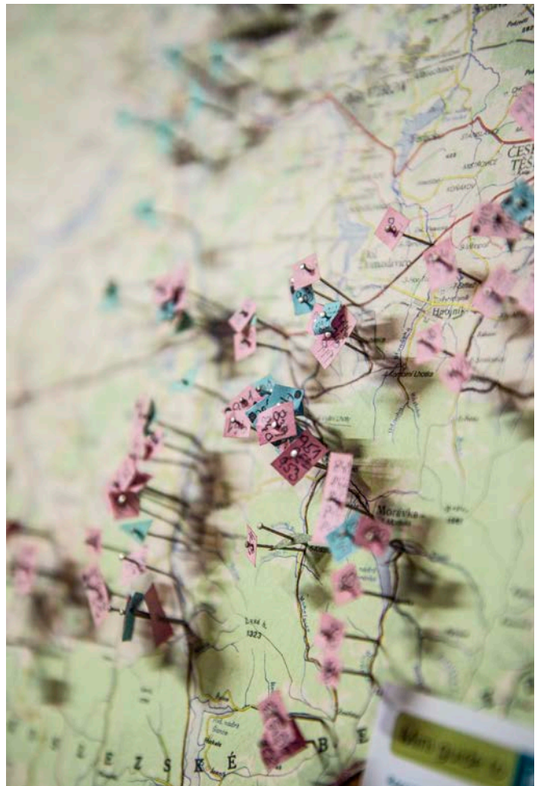
The database we established has become a milestone in the study of plant invasions. In our texts, you'll find not only descriptions of general principles but also extensive global-level analyses, and these articles are cited much more than works on individual plant species. As for the high citation rate, it's because our field has experienced significant growth in the last 20 years, and almost every ecologist, botanist, or zoologist eventually encounters invasions in their work.

Given that your father was the renowned Czech botanist Antonín Pyšek, did you really have a chance to pursue any other field?
The truth is when you see a deep passion for nature from a young age, you don't really consider anything else. I observe this in my four-year-old grandson Matyáš now, who is curious about everything in nature. We all have a close connection to nature: my daughter is a zoologist, my wife is a landscape architect, and I am a botanist. The link goes back even further: my grandfather was the head forester for Count Kolowrat.

Therefore, you too were influenced, in a non-coercive way…
Non-coercive… you could say I ended up in botany mainly because at one point I felt a bit sorry for my dad. He made a significant effort, taking me into nature, teaching me how to find my bearings and see connections, urging me to learn about plants. Like most children, though, I was more interested in animals as I had fish and turtles that I cared for. But at the age of around 14, I told myself I would make my father happy and learn to determine a few plants which I thought would satisfy him and that would be the end of it. However, because I am at heart a collector, I began my own herbarium and starting keeping records of all my specimens and plants I had seen. That was how I started.

Later, you and your father became colleagues in the field – that must have been very special.
In the 1970s, after the crushing of the Prague Spring, my father was fired from the Faculty of Education in Plzeň, where he had been teaching botany. He joined the company *Stavební geologie* (Building Geology), where he worked alongside hydrogeologists to detect and trace the direction of contamination in oil or gas leaks. My father became a pioneer in this field, one of the first in the world to identify the direction of spills by studying symptoms in vegetation, observing changes in colour, vitality, or the presence of certain plant species. After graduating from the Faculty of Natural Sciences at Charles University, I joined him in this work for seven years. I have fond memories of working together.

What about the influence on your daughters?
It's nice to have a good relationship with your own child and a common professional interest. With my daughter Klára and other colleagues from the Institute of Botany of the Czech Academy of Sciences and the Faculty of Science at Charles University, we initially worked in Africa on a biodiversity project. In Kruger National Park, we studied the effect of seasonal rivers on the maintenance of species richness in the plants and animals of the African savannah. We cooperated with ornithologists, entomologists, one group studied bats, Klára used camera traps to record mammals. This monitoring is still going on, for five years now. The uninterrupted recording of animals that are found in an area about the size of a quarter of the Czech Republic is already becoming quite unique due to the length of the monitoring period. My older daughter, Bára, is a physiotherapist, so she too has not escaped the family biological tradition, although she has gone in her own direction. She is the mother of two boys, with the older one I mentioned I could have quite 'sophisticated' discussions about dinosaurs.



How the giant hogweed came to us from the Caucasus is not fully known and might never be fully answered.

Where and when have invasive organisms directly crossed your path?
Back when I was working with my father, when we were focused on something fairly routine. You know the giant hogweed? It's easy to see from a distance, often growing along the road. We began to record its presence during our travels until we managed to map it all over the Czech Republic. When I visited Oxford University in 1991, I met people who were working on invasive plants. Two years later, we organised the first conference on invasive plants in Kostelec nad Černými lesy, where I was working at the Institute of Applied Ecology of what is now the Czech University of Life Sciences. The event later formed the basis for regular meetings. They are still held at two-year intervals in various places around the world today.

Is there anything to like about hogweed, really? The Metternichs are said to have planted it in the park at Kynžvart castle because it was so unusual.
How the giant hogweed came to us from the Caucasus is not fully known and might never be fully answered. We have a general idea but a few pieces of the story are missing. The plant is undoubtedly impressive, it is the largest herb growing in Europe. Is it truly ugly? It's pointless to foster negative emotions towards plants: they just do as they can.

"The Return of the Giant Hogweed" is also a song by Genesis from 1971. I know you are fond of music: if you could grab a beer with any musician, would Peter Gabriel – as an amateur invasive biologist – be one of them?
There would be quite a few but Peter Gabriel is one of my lifelong favourites. I thanked him in a section of my master's thesis because I had listened to a lot of the early Genesis albums, right up until he left to pursue his solo career. Very aptly describes the history of the invasion of the hogweed. When we published a European monograph about hogweed in 2003, we used excerpts of the lyrics as epigraphs for each chapter.

***Heracleum mantegazzianum*, the most widespread tall invasive hogweed species, was first described in 1895. The plant's introduction into Europe, however, began much earlier, sources state.**

Professor, you received the prestigious Czech Head Award for your life's work: what was that moment like?
Do you mean in terms of the live television broadcast? I'm more of an introvert by nature so I initially felt a little out of place. But everyone was very kind and helpful and it was fine. I am fortunate to have received several significant awards during my scientific career, including the Neuron award in 2018 or the International Biogeographical Society award in 2021. I value them all greatly, but I consider the *Czech Head* the highest recognition as it is a domestic award. Hopefully, it raised public awareness of biological invasive ecologyons and how problematic they are.

An award like this and the associated publicity can help draw attention to the fact that what's called "green biology" has its place among modern scientific disciplines, and the topics studied by invasive ecologists are important. We continue to make progress in the field and the organisms we work with need to be well understood.

Designing **better** medication

“In addition to scientific research, I also work in a pharmacy, and often hear from elderly patients how hard some medical tablets are for them to swallow. That is why I focused my research on developing tablets that disperse in the mouth. I see a lot of potential and therefore purpose in my scientific work,” says Thao Tranová, a postgraduate student at the Faculty of Pharmacy at Charles University.

STORY BY Jitka Jiřičková PHOTOS BY Hynek Glos, Faculty of Pharmacy archive

Thao Tranová has been the lead author of numerous articles published in prestigious international journals and the 2023 winner of The Parc Awards in the Student Choice Award category, which is announced annually by The Parc – a science and technology cluster founded by pharmaceuticals company, Zentiva.

She spoke to *Forum* about her success and decision to go into the field.

Why did you decide to go into pharmacy?
I have always enjoyed chemistry and biology, and at the same time I wanted to be in a field useful to society. So pharmacy seemed like a good choice. I was also close to the field thanks to my mum.

Ah, you got it from her?
My parents immigrated from Vietnam to what was then Czechoslovakia at a very young age. My mother graduated from the University of Engineering and Textiles in Liberec (now the Technical University of Liberec – ed. note) and graduated with a red diploma. It was always important for her to help people. Because she spoke Czech, she decided to interpret and translate for her compatriots. She would accompany them to the doctor, to hospitals…

What about official bureaux?
That’s where my dad went. My mother, because she was in the medical field, motivated me to go in this direction. It was instilled in me from a young age. After high school, I applied to pharmacy, medicine, the Faculty of Science as well as the University of Chemistry and Technology Prague, and finally decided on pharmacy.

When did the turning point come when you learned you preferred science and research to working in a pharmacy?
When I was doing my thesis. In my fourth year, I decided to do it at the Department of Pharmaceutical Technology and I found that I enjoyed scientific work. Since then, I have been getting closer and closer to science and slowly finding my way. Subsequently, Associate Professor Jitka Mužíková offered me to continue my doctoral studies at the faculty.

What did you focus on in your thesis?
I investigated the effect of different excipients on the properties of high-dose tablets. I collaborated with Zentiva, which I saw as an enrichment, an insight into practice and an introduction to the possibilities offered by the current pharmaceutical industry.

Why tablet research?
It was an opportunity that was offered, the idea came from Zentiva. Tablets are one of the most common dosage forms. The manufacture of a tablet seems easy at first glance, but technologically there are a lot of interesting moments and development phases to research. In my thesis, I looked at the different effects of excipients on the properties of the tablets and did basic tests, for example whether a tablet meets a certain hardness or whether it disintegrate fast enough. I investigated high-dose tablets, which are not entirely common so the excipient also had a significant effect on the functioning of the tablets.

The fact that orodispersible tablets disintegrate quickly in the mouth and can only be swallowed with saliva means that they do not even need to be swallowed, really. They are suitable for patients with trouble swallowing, such as the elderly or children or patients after chemotherapy.

In my doctoral studies, I then started to look at a different type of tablet, namely orodispersible tablets, which disintegrate quickly in the mouth. I worked on formulations with different drugs that are suitable for these types of tablets. The fact that they disintegrate quickly in the mouth and can only be swallowed with saliva means that they do not even need to be swallowed, really. They are suitable for patients with trouble swallowing, such as the elderly or children or patients after chemotherapy.

These tablets are not yet completely common on the market, which makes their future all the more interesting.
Exactly. I work part-time in a pharmacy, so I’m in fairly frequent contact with patients, and I hear complaints, especially from older clients, about ↪

how hard some tablets are to swallow and hear they'd prefer the medicine in another form. For this reason, I wanted to focus my research on dispersible tablets in the mouth, where I see a lot of potential. That is the purpose of my scientific work.

For your research, you received a Parc Award from the Centre for Applied Pharmaceutical Research, which was founded by Zentiva in collaboration with Czech academic institutions. What has this given you in practical terms?
It's been a great and incredibly rewarding opportunity for me to collaborate with colleagues from other departments. Moreover, Zentiva has excellent instrumentation facilities that I can use within The PARC (Pharmaceutical Applied Research Center). Within PARC, I am working on the preparation of spray-dried materials for use in orodispersible tablets. My expert consultant is engineer Petr Koukal from Zentiva. PARC symposia are held three times a year where I present my results and get feedback on my work from industry experts, academics and fellow PhD students from other departments. This also pushes me further and opens the door to inter-faculty and inter-university collaboration.

How specifically can people from other disciplines help you in your research?
For example, if I need to use a method that is unavailable to me, I contact a colleague from another department, who is familiar with the approach and has the necessary equipment. This then leads to co-authoring teams for publications that can be successful in prestigious international journals.

When I started graduate school, it was my wish to try to make tablets using 3D printing, and the workplace in Krakow had this technology in place. However, tablets dispersible in the mouth were not being developed at that time.

What are you most excited about at the moment?
Earlier this year, a paper published in the prestigious *International Journal of Pharmaceutics*. It describes the preparation of orodispersible tablets by direct compression, using co-processed excipients and three different drugs that are suitable for orodispersible tablets because of the potentially rapid onset of action of the drug. Interestingly, to assess disintegration time, an apparatus was used that mimicked mouth conditions – that is, a small amount of water was used, and the apparatus also mimicked chewing, palate or tongue movement, which helped us to see how the tablet might realistically behave in a person's mouth. This device was built by my consultant from my internship at Jagiellonian University, Witold Brniak. Therefore,

the paper was written in collaboration with Jagiellonian University and the University of Chemistry and Technology Prague. With Ondřej Navrátil, who I met through PARC and the University of Hradec Králové with Jan Loskot, with whom I have been collaborating since the beginning of my postgraduate studies.

How long were you based at Jagiellonian University?
I went on a three-month internship during the summer holidays, at the end of my first year of PhD studies.

So there were no classes, and the academics there had time to devote to you?
That's right. I just hit the period between semesters, when it's mostly science, because there's plenty of time to do science. So every day we could consult the results, strategise…It taught me the importance of teamwork.

When I started graduate school, it was my wish to try to make tablets using 3D printing, and the workplace in Krakow had this technology in place. That's why I chose it for my internship. However, tablets dispersible in the mouth were not being developed at that time. Nevertheless, we started working on this topic collectively and the result was a publication in an international scientific journal. The combination of our idea and the experience of Polish experts really produced results.

You already have had a lot of success: The Parc Awards, articles in prestigious scientific journals, presentations at international symposiums… This is certainly not common for a third-year postgraduate student in pharmaceutical technology. Or is it?
If I were to compare myself with my classmates, I think we all give our best to our work. But maybe the reason for my quick success is my background from high school. I graduated from the Czech-German Thomas Mann High School in Prague, where we spent a lot of time writing term papers and presentations, even in German. I think I still benefit from this intensive and very good foundation. The good and pleasant cooperation with my supervisor, consultants and all my collaborators in the field of my scientific work is certainly a part of it.

Working in the lab, at the computer, writing papers, conferences… Where do you find the time?
I admit, it's a wild ride. Since I started graduate school, I've had to learn to work really fast and efficiently. But on the other hand, I have to rest just as deliberately. For example, it's great to clear my head when I play sports. There's not much time to relax, but still you have to find it.

Thao Tranová is a postgraduate student in her third year of the Pharmaceutical Technology program and member of the scientific group Drug and Drug Formulation and Carriers at the Faculty of Pharmacy, Charles University. She is working on her PhD thesis entitled *Orodispersible tablets*. She also works part-time in a pharmacy in Jablonec nad Nisou. She is the lead author of articles in prestigious pharmaceutical publications including the *International Journal of Pharmaceutics*. She also co-authored papers at two international symposia in Slovenia and the Netherlands in 2022. The papers were written during her internship abroad at the Faculty of Pharmacy, Jagiellonian University in Krakow. This year, she won a Parc Award in the Student Choice Award category.

Anyone can have an off day

“I have twenty kids in each classroom that I can influence, inspire, or teach critical thinking. I teach multiple classes, and as a result, I have an impact on many children’s lives. That’s the beauty of the teaching profession,” says Daniel Pražák, a teacher, education populariser, and PhD student at the Faculty of Education of Charles University.

STORY BY Pavla Hubálková PHOTOS BY Vladimír Šigut, Daniel Pražák’s personal archive

So many roles leave me wondering, who is Daniel Pražák, really? He replies candidly, “When I have to talk about myself at length or introduce myself, I always feel like I am going to break out in a rash. What to say that doesn’t sound stupid and at the same time describes what I do? Lately I’ve been referred to more and more often as a ‘populariser of teaching’, which I actually really like,” Daniel Pražák explains with a wry smile. How did a history and science teacher become an influencer with more than 23,000 followers on X, formerly Twitter? “Around five years ago I realised that when people talk about teaching on Twitter, it’s usually in the negative; positive comments were completely absent. So I thought that I would try to use that and eke out a space in this ‘free ecological niche’,” Pražák says. His approach is considered so novel it is now often used as an example in marketing training on brand strategy.

Countering negativity

The idea for a podcast series titled *Hovory z kabinetu* (*Talks from the Teachers’ Office, or Study*) was similar. “When the media talked positively about schools, it was usually only Prague schools or private schools that were mentioned and otherwise it was a wasteland – ‘Mordor’. But again, this is not true at all! So I thought I’d try and bring positive stories into the public space through podcasts,” the innovator says. As host, he is always delighted when his guests are then consequently ‘discovered’ by the broader media and gain wider traction.

Daniel Pražák likes to say that the media space is infinite and anyone can communicate their topics and he often prepares teachers for media appearances. “It’s not rocket science; you just have to prepare. It’s good to think about the main message in advance and to allow for the need for simplification – journalistic shorthand. I really like what science journalist Petr Koubský wrote: ‘If you are reading a popularisation article about your field, be aware that you are not the target audience.’ And I always try to stress that a media article is not a direct outlet for fellow teachers,” he recounts, “that is important.” ↪

Around five years ago I realised that when people talk about teaching on Twitter, it’s usually in the negative – positive comments were completely absent.

Open to better learning

"I believe that if you strive for something good and give it your best effort, you will succeed," he was quoted in the *Tajný učitel* (Secret Teacher) blog. What is he striving for now? "Right now I primarily want to finish my PhD," Daniel laughs, "but in the bigger picture, I want to help create a better world. I know it sounds clichéd, but I have 20 kids in every classroom that I can influence, inspire, teach to think critically and verify facts. I teach in multiple classrooms, so it scales, and as a result, I have an impact on many lives. That's the beauty of the teaching profession."

Otevřeno (Open) is a non-profit association that also seeks change from within. About seven years ago, a number of pedagogical students got together in Brno and decided they wanted to prepare for the teaching profession differently. They approached other faculties, and a student organisation was formed, which grew into a nationwide movement today that brings together students, teachers and academics. What are they about? "Together, they are working for change and community support," says Pražák, who was also a part of the initiative. And he points out that thanks to the group's focus, there have been significant changes for the better even since his own student days.

From Penny to Dissertation

Daniel Pražák is a PhD student at the Faculty of Education; how is the dissertation coming along? "Oh, she's good and she's not as afraid anymore." Come again?! "She still pees on the corner of the bed sometimes," the teacher says with a laugh. He quickly explains. At the beginning of the Covid pandemic, Pražák adopted a cat someone had named Penny, but he soon renamed her Dissertation. "Who wants a cat named after a supermarket? She's a wonderful topic of conversation. And since I adopted her during the first wave of the pandemic, she experienced most of the online teaching, training and workshops with me – mostly behind my neck, nibbling on my ear, so she's become quite famous," he says. His Dissertation has become, among other things, the heroine of the @edukocka Instagram account, where the educator shares teaching tips. Who else can boast such a loveable, erm, cat?

If I'm introducing something new when I'm teaching, it's very likely to fail the first time, maybe even the second or third.

Dissertation the cat. Daniel Pražák renamed his adopted feline friend who was formerly called Penny. "I didn't want a cat named after a supermarket chain," Pražák says.

How schools cooperate

His actual dissertation explores how schools collaborate, inspire each other or exchange innovative ideas including what works best and where the barriers lie. "Although collaborations exist, no one in the Czech Republic has studied them much scientifically. We know much more about the situation abroad, which was also the activity of my first two years of my PhD. I had to read an enormous number of foreign articles, which gave me a good information base and an overview that I can draw from and use as needed," the doctoral student says.

"For example, during Covid, it was confirmed that schools that were connected, and shared capacity or teaching materials, were better off. But in some specific cases – for example, when a school was very small – sharing paradoxically meant much more work, which even the school itself might not have realised. It's important to have situations backed up by data."

Honesty about mistakes

Daniel Pražák's public speaking is unique in another respect: he's not afraid to admit mistakes. He will calmly say that something went wrong or he was under stress and that he needs to think about his own wellbeing. What made him do that? "The first time I was asked, quite seriously, if I ever had a bad lesson. I remember blurting out, 'Yeah, we all do!' And that's when I realised that we often don't talk about it at all. That it's not just beginning teachers who may feel that others around them are all great and flawless while they're the only ones failing. We all think at one moment that we might not be cut out for it…," he explains the topic he and his colleagues are trying to bring into the public sphere.

His advice? Not to sugar-coat anything. "It's important to stick to reality. If I'm introducing something new when I'm teaching, it's very likely to fail the first time, maybe even the second or third. But that's no reason to walk away from it; rather, you need to look at why something isn't working," Pražák suggests. Sometimes all you need to do is spend more time on a topic to you're trying to explain or show to others.

Education after Covid

In the spring of 2020, the world was hit by the coronavirus pandemic, which had an impact on education. As we still well remember, the system was left reeling and the impact since has not fully been tallied, which many consider to be a mistake. "Distance learning left a huge mess. I teach the higher grades at a primary school and there are classes where the impact is still evident: on relationships, on behaviour, in psychological problems… There are many children who started the second grade or even first grade of primary school – developmentally important moments – online. This is an unresolved issue and we need to work with children and with teachers who went through this," the researcher and educator says.

On the other hand, many wonderful support activities were created during lockdowns, and teachers learned and shared them. Things were not all bad. "The learning of the future is not online learning, or at least I hope it isn't. But Covid has shown us the importance of reflecting what we teach and being more selective about what is really relevant. I think there has also been a greater understanding between parents and teachers. But most importantly, as teachers, we learned to share preparation, approaches, materials. Thanks to online teaching, it was easy to connect with a class in Ostrava, for example, and that has stayed with us."

Education doesn't end with classic schooling. For example, Daniel Pražák taught himself how to photograph like a professional just by watching various tutorials on YouTube. "I started to ask professionals to give me the most critical feedback: how could I improve, what would they do differently… And at an event I met a well-known photographer who was going to tutor for the first time. He was very nervous. So I gave him some tips on how to talk in front of people, and we became friends and he gave me feedback on photography.

"Today's world demands lifelong learning. At the same time, thanks to the internet and social networks, we have an incredible opportunity to learn from the best from all over the world. Let's take advantage of it," Pražák says.

Daniel Pražák is a teacher of history and science at ZŠ Strossmayerovo náměstí primary school in Prague 7 and also a PhD student at the Faculty of Education at Charles University. He is the host of his own podcast where he introduces the public to inspiring teachers and topics. He is closely followed by more than twenty-three thousand people on X, formerly Twitter.

Secrets of the **Moravian** Karst

Imagine analysing a buried vessel once used to share 150 litres of beer? Or investigating an ancient burial site for elites from the Hallstatt culture in the Moravian Karst? Archaeologist and Charles University doctoral student Zuzana Golec Mírová has done that and more - making a number of significant finds on her own as well as in broader teams. To hear her talk about archaeology is nothing less than thrilling.

STORY BY Jan Velinger PHOTOS BY Vladimír Šigut

When did you first get interested in the field?
I first became interested in archaeology when I was just a little kid. I was only around five when I saw a documentary about the Holy Grail and I found it fascinating. The impression stayed with me. It made me want to read everything I could about it and later to even learn French so I could be like Jean-Francois Champollion – the founder of modern Egyptology! I very much wanted to be an archaeologist but it was only much later, of course, after my last high school exam, that I was accepted at the Dept. of Archaeology at Palacký University in Olomouc. The feeling of getting accepted, not long after my final, was amazing.

What period in human history or prehistory caught your interest?
I was always interested in periods that presented many unanswered questions or mysteries. Many of my fellow students were interested in the Palaeolithic but I was drawn to the Bronze and Iron Age and specifically the Hallstatt period dating back to around 800 BC up to around 450 BC. I had fallen in love with precisely made artefacts from that time: beautiful jewellery, gold and bronze as well as glass and amber objects, or items like horse-drawn wagons. At first – to my shame – I didn't know anything about the Hallstatt period, but I settled on studying this era because I was attracted to the artefacts they left behind.

Who were the Hallstatt people?
In the Czech milieu, it is a matter of debate and they are often referred to simply as Iron Age people. However, they are also often termed the Early Celts, which I think is fine for a popular understanding of who they were. Even if we have no idea what they called themselves.

You joked in one interview that you chose the Hallstatt period over earlier times because in the Palaeolithic they ate horses while here they used them to pull wagons and then began to even ride them. Of course, you also ride yourself.
That's true! (laughs) I began riding at the age of 10 although not consistently: there were many interruptions or pauses. However, I still ride now. Being on horseback allows you to survey beautiful nature around you and riding is a feeling of freedom.

In the Hallstatt period, draft horses were common but they were only about 130 centimetres tall, almost like ponies. Larger horses were brought to this part of Europe at around that time and some of these were up to 147 centimetres. Not surprisingly, these were coveted by the elite. The horses – and being able to ride them – became an important status symbol.

The Hallstatt people were also in other parts of Europe, today's Germany and Austria, and in Moravia. You conducted a lot of research here which we will get to shortly. But before that, you were also involved in a remarkable study of a large vessel found in the region of Pardubice, east of Prague. From the same period.
That's a nice story. In 2019, the vessel was accidentally found by a gentleman named Pavel Rybka during a walk and he contacted archaeologists to excavate the item, also contacting the Museum of Pardubice. The find brought together archaeologists from Bohemia and Moravia, who organised the excavation including the soil inside. We created a broader team for soil analysis. People naturally think the vessel is the most valuable thing but, in ↪

Zuzana Golec Mírová studied archaeology at Palacký University in Olomouc. She focuses mainly on the Bronze Age and the earlier Iron Age and is currently most engaged in research on social elites. She also deals with e.g. the horse in prehistoric times or the application of chemical methods in archaeology (e.g. analytics of the origin of amber). Since 2019 she has been pursuing PhD studies at the Institute for Archaeology, Faculty of Arts of Charles University in Prague. Her forthcoming dissertation is entitled "Centralization and decentralization processes of the 14th-4th century BC in Moravia". Zuzana Golec Mírová has lectured at Palacký University in Olomouc, Eberhard Karls Universität Tübingen, Universität Wien, the University of Edinburgh and the University of Bologna. At Charles University she teaches a lecture course called the Early Iron Age in the Central European context on the example of Moravia and Hallstatt and La Tène Periods.

this case, the same was true of the soil, from which we hoped to gather new information.

To get to the soil, you had to – at the same time – conserve the item. Was that tough to do?
The vessel is large: about 80 centimetres in height with a volume of 150 litres. It was difficult and expensive to conserve and not a quick process, because if you were to just shovel the dirt out, it would collapse.

What was the vessel used for?
What something was used for is always a tough question to answer but we already had a few clues: the item was found away from the usual settlement area. The volume suggested a beverage for a large number of people, which made it likely to have been used in a ritual. The answer was in the soil. Because we did broad content analysis, with botanists, chemists, palynologists and others who studied the starch, we determined that the soil contained traces of not just herbs but what was the oldest herbal-millet beer discovered in this part of the world. As for the item, the decoration on the vessel was also unusual, depicting mythological motifs: waterfowl pulling a solar barge, or the Sun, in the sky.

What did the analysis reveal about the taste?
It was clear it must have been very sour and bitter – so a type of beer immediately came to mind. But at this point it still hadn't been confirmed. A lot of research went into comparing finds in the Balkans and Africa but it was analysis of the starch from colleagues in České Budějovice that confirmed the drink had been boiled and fermented. That was the last proof it was this herbal-millet beer. That confirmation led to our results being published in the prestigious British journal *Archaeometry*. It was a success, we had some citations and at least one team, in Siberia, built on our methodology and approach.

Since this success, you applied the methods you used and developed on similar samples you found in a famous cave called *Býčí skála* (Bull Rock or Bull Rock Cave) in the Moravian Karst, which was an area used by those early Celts in the Hallstatt period. You were able to put together a second beer recipe, one that you had brewed and bottled in limited quantities for promotional purposes. That cave at Býčí Skála was hugely important in Hallstatt culture.
In this case, we didn't have a single vessel but we decided to recreate the recipe based on millet and other traces of herbs found in the cave itself. Thanks to the Department of Analytical Chemistry of Palacký University, the Institute of Botany of the Czech Academy of Sciences and the Laboratory of Archaeobotany and Palaeoecology of the University of South Bohemia, we were able to determine the recipe. We asked our friends Martina Duchoslavová and Richard Antl, from a local brewery called *Lesia*, if they would create the beer for us for special occasions and promotion, like museum days, and they agreed. The beer is called *Tauriale* with Taurus, of course, meaning bull. I brought a bottle in for you to try and you can tell me what you think.

Ok, I'm game.
Here you go… but be careful it's very…

Sour! It's very sour! Wow!
It is. And I forgot to say they also included honey in the recipe.

I can't taste any honey! Very unusual. Here's what I'd say: even if I was a beer person it would take some getting used to. Still, it's amazing to think they drank something like this in the Iron Age. What did your colleagues or other people say about it?
I think they like it.

Larger horses were brought to this part of Europe at around that time. Not surprisingly, these were coveted by the elite. The horses – and being able to ride them – became an important status symbol.

If this beverage was a facilitator in shared ritual, what did these famous cave systems in the Moravian Karst represent? Were they important in ritual as well?
In the Neolithic period they would have used the entrance part for shelter and did cave painting much further inside, for example at the Kateřinská cave, the oldest in the Czech Republic. If we jump far ahead, to the Middle Ages, the caves were used by counterfeiters of money. And during the Hallstatt period they buried their deceased inside – the cave was used as a tomb for elites. It is one of the top Hallstatt sites in all of Europe and was used for around 120 years, so there were many generations of elites buried there along with their possessions including glass items and weapons and wagons. Some of them were wagon graves. It is a huge *necropolis* and burial ground, something that didn't exist in the open landscape. It is of world importance, a very important site.

It is the also the place that remaining parts of once elite iron covered wagons were found in the past but their importance not understood. You connected the dots by researching in depositories. What you found suggested there were connections between different sites…
I realised that previously we knew of only one such wagon in all of Europe, found at the Hochdorf chieftain's grave in Baden-Württemberg, Germany from the Hallstatt culture and in the depository I found we had evidence of a twin in Moravia 800 kilometres away! In fact, we had at least six more similar metal-covered – bronze and iron – wagons at one site. Now we know of 13 beautifully decorated metal covered wagons in Europe but six were found at one place in the Moravian Karst. That is very unusual.

Surviving parts had all been taken to depositories many years before but nobody paid the remains of these wagons much attention. Rusted iron looks much worse than bronze lying in a corner and nobody connected the dots before I looked into it. That is what I found.

When you realised there were these connections it must have been like solving one of the best mysteries, ever!
Exactly! I couldn't believe I had uncovered what was basically Hochdorf wagon No. 2. But I have since discussed it with colleagues in Baden-Württemberg and other colleagues in Austria who confirmed as much!

It must be very rewarding, with finds like this, to know you are also popularising archaeology, whether with publications about ancient beer or elite iron covered wagons. I mean, how can audiences *not* be drawn in!

Hallstatt Period costume

When Zuzana Golec Mírová posed for our cover, she wore a Hallstatt Period costume based on findings from Býčí skála cave. It is a costume that would have been worn by the elite, representing the greatest luxury in society at the time. Red was considered a luxurious colour, the tablets – the borders of the clothing – were inspired by the finds from the Hallstatt burial ground. Women in that time also wore a veil on their heads. The biggest speciality is a compound belt of Moravian type with a central disc with a sun motif. It consists of 22,000 subtle bronze rings woven into the fabric. For the photoshoot, Zuzana also wore bracelets and characteristic navicella-type fibulae. Her necklace is made of several hundred amber and glass beads.

Popularisation is an important aspect of what we do. We need to enjoy informing the broader public about our work and what we receive funding for. That is very important.

A lot of this sounds like very detailed, patient and fascinating work on so many levels. But you are not alone on your archaeological journey. Your husband, Martin Golec, is also a well-known archaeologist and academic. Sometimes couples in the same fields work closely together and sometimes they do not. What about you as a couple?
I love it! I love working together! Imagine you have something like home office and you make a discovery: you can *immediately* share it with another scientist. Sometimes it is difficult: we say, "Ok, now we will go for a nice walk and we won't talk about science or archaeology," and then for the next three hours we discuss… archaeology! New ideas and new projects. Sometimes it feels like you never leave work but it really helps to develop ideas more quickly. You always have something to talk about and you never have silent nights!

Forum Radio 2023: Captivating interviews with notable personalities!

This year, we featured a line-up of absolutely fascinating guests. While in ‘season one’ we interviewed people like the Czech Republic’s first female rabbi or a doctor/adventurer who has travelled the world and survived some very sticky situations, in ‘season two’ we spoke with well-known figures such as translator Martin Hilský or sociologist Petra Guasti. You can find all of our interviews online. If you’re not sure, just pick one to listen to and follow the QR code.

STORY BY Jan Velinger PHOTOS BY Vladimír Šigut, Michal Novotný, Hynek Glos, René Volfík

A labour of love

Martin Hilský is a professor emeritus from the Faculty of Arts at Charles University and one of the Czech Republic’s best known literary translators. He translated all of William Shakespeare plays as well as the Sonnets, into Czech. He is a recipient of the Order of the British Empire, the State Prize for Translation, the national Czech Head prize, and the Magnesia Litera Award, which he received for *Shakespeare’s England: Portrait of an Age.*

“I was one out of many, but at the beginning of my Shakespearean ‘career’ or ‘journey’, I wanted to change the way of translating blank verse, I wanted to stress the sentence structure and so on. The problem is that iambic metre is a rising metre, while Czech is a falling metre and they do not see eye-to-eye. If you translate Shakespeare, it requires you to go ‘upstairs’ and in Czech you have to go against the grain of the English language! You ‘go upstairs’ too, but you have to ‘cover up’ all of the effort you invested, which is not easy.”

The Brown House and Prague’s ‘Little Berlin’

This year saw the publication of a new monograph titled *Little Berlin in Big Prague* by artist, academic researcher and art history graduate **Lenka Kerdová**. The foundation for the book was research for her PhD examining Prague architecture during the interwar period – specifically, buildings designed by German-speaking architects. These included professionals of various backgrounds: ethnic Germans, Czech Jews, or German-speakers from abroad seeking their place in a vibrant new market. One of the most famous examples is the Brown House found in Prague’s Holešovice.

“There are multiple reasons why the topic of many of these architects were not well-researched before – some political, some competitive, some historic – and the result was a lack of research and a great lack of material in the archives. After the communist takeover in 1948, the German past was shunned. Even during the interwar period, there was a great emphasis on the part of the Czech avant garde to highlight Francophonic culture. The German impact in architecture, literature, arts and letters was a strong one. In architecture, the influence was particularly obvious and I even knew that there was an area nicknamed ‘Little Berlin’.”

In the shadow of megaprojects

Petr Witz is a Postdoc researcher and Assistant Professor at the Department of Public and Social Policy at the Institute of Sociological Studies at Charles University. Witz was based for three years in Copenhagen and worked with the largest cross-border infrastructure project in Europe – the Fehmarn Belt Fixed Link – a massive underwater tunnel set to link Denmark and Germany.

“Megaprojects need legitimacy and it begins with questions of trust, morality and majority that are a part of what we call a legitimacy cycle. These are aspects we have tried to understand and define. Any such project represents a disruption and an upending of the status quo and there is no question there are groups of people who will lose out and people who will be forced to move to new villages as a result. Then there are questions of compensation being fair and coming up with reconciliation measures that properly address the situation.”

Populism and its discontents

Petra Guasti is a highly-respected sociologist and political scientist at Charles University who teaches at the Faculty of Social Sciences. She was a frequent guest in the Czech media in the run-up to the Czech presidential election which was largely seen and framed as either a continuation of populist policies and approaches – or a return to dignity at Prague Castle. Guasti has researched polarisation in society as well as how politicians – sometimes successfully – manipulate our worst instincts and fears.

"What we realised over the last 10 years is that the guard rails of liberal democracies are much less firm than we thought. What is new in politics is that there are so many emotions now in political campaigns. There have always been grievances: fear and anger as well as hope. The difference is that politicians choose more often which emotions to appeal to: whether positive in terms of hope or fear-mongering that we saw used by one of the campaigns to try and reach more voters."

Author of *Women of the Old Testament*

Jan Fingerland is a graduate of Charles University who studied political science, philosophy and religious studies in Prague, and also York, Stockholm and Jerusalem. He is recognised for his work at public broadcaster *Český rozhlas Plus* as a foreign policy commentator and more. As a columnist, he writes about culture, history and religion, above all in the Middle East. Fingerland is the author of the bestselling *Hebrejky* or *Women of the Old Testament*.

"Hebrejky – or Women of the Old Testament – came from a series of articles I wrote over the years, largely for Reflex magazine, published by my former editor Dan Hrubý who runs a small publishing house called Pražské příběhy. The first printing got very good reviews and sold out ahead of the holidays. The book looks at the lives of 21 biblical women including Eve, Lilith, Judith, the Virgin Mary, Mary Magdalene and others. It is not just their story but the many different layers – or an overlay – of what I call hypertext of cultural and religious interpretation and meaning. These include how they were viewed, accepted, and at times wronged over the centuries."

How scary monsters came to dominate video games

Jaroslav Švelch, the author of a fascinating social history titled *Gaming the Iron Curtain*, published by MIT Press, saw the release of a new book in 2023 called *Player vs. Monster: The Making and Breaking of Video Game Monstrosity*. In our interview, we talk about the history of monsters, the role they play in video games and what they tell us about ourselves. Also discussed: aesthetics, transgressive elements, horror and comedy as well as how video games and video game narratives brought fantasy and science fiction into the mainstream.

"What is seen as monstrous changes over time. Every culture has its monsters and they reflect present fears, beliefs, religion, and other aspects. Where video game monsters differ from their representation in literature or other media, is that in games they have to have a database of information underlying their design. The can't be described as an 'unspeakable or unimaginable horror or evil' as H. P. Lovecraft might have put it, but have many more characteristics, statistics, health, and strategic weaknesses, which players might not know at first, but gradually become apparent."

From science populariser to vice-dean

For the last few years, **Aleš Vlk** was best known as the co-founder of science portal vědavýzkum.cz but the expert on higher education, science policy, popularisation, and research and development recently made the jump to the Faculty of Physical Education and Sport. He serves as the vice-dean for external affairs. He talks about what it's like to be on the other side: in an institution like Charles University and how day-to-day realities require a shift in thinking to tackle, not problems, he says, but tasks.

"One way or another, I have been involved in higher education policy since I was around 18 and I thought I would know something! But I can tell you that if you start work at a faculty it is a different playing field. When you get involved at the faculty level, only then, I found, do you learn what higher learning is, what teaching is, what administration is and what research is. Now I have experience from the inside. I have been enjoying it and have been learning a lot."

Literary translation is all about style

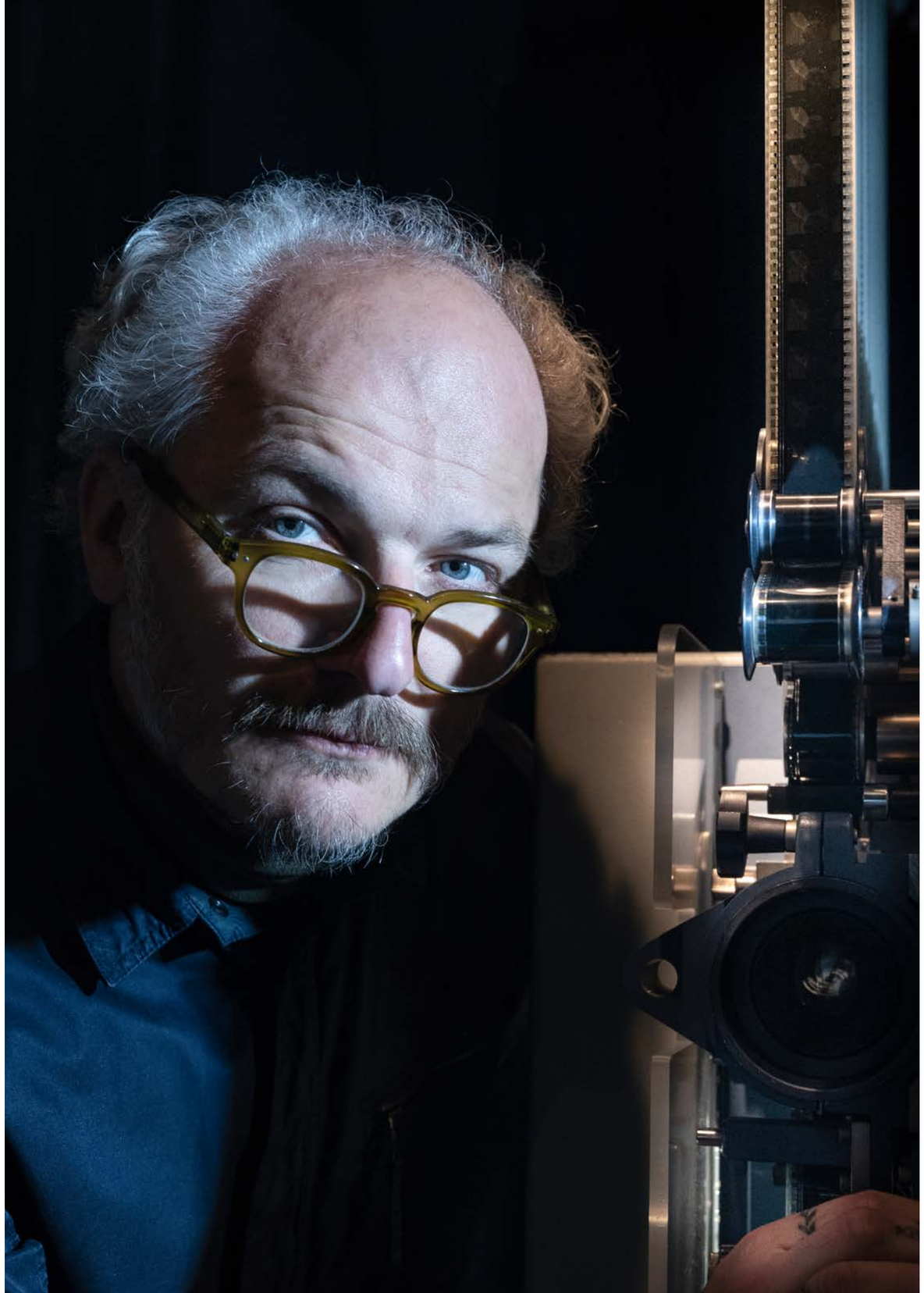
American literary translator **Alex Zucker's** work includes novels by some of the best contemporary Czech authors including Bianca Bellová, Petra Hůlová and Jáchym Topol. His original aim was to be a marine biologist. But that was before he became interested in international affairs, completed a degree at Columbia, and visited the former Czechoslovakia.

"I get asked a lot about how much interest is there in Czech literature in the English-speaking world and I always say 'None' (laughs). And I've said that in interviews with Czech journalists and it gets mistaken as a negative statement as opposed to the way publishing works and how people read. Most of us don't read books based on the country the author comes from. We want to read a book because it has a good story, or the author seems interesting or it's in a genre that we like. Books being classified by country is partly because of academia or the way countries promote themselves, but most of us don't read that way."

About the host

In the '90s, **Jan Velinger** studied film directing and completed his Master's at the FAMU film school in Prague. At around the same time, he began pursuing a career in the media, working first in television and later in radio and print. A presenter and reporter at the international service of Czech Radio for more than 16 years, Jan moved to Charles University in 2018 to work as the editor of Forum EN. The Forum Radio podcast has been a welcome opportunity to get back behind the mic.

Forum Radio



Talking with **Jarmusch** was the best!

“Any discussion about a good film inevitably ends up being a discussion about life,” says Karel Och, the artistic director of the annual Karlovy Vary International Film Festival. A graduate from the Faculty of Arts of Charles University, Och wouldn’t have it any other way: films have defined his entire career.

STORY BY Helena Zdráhalová PHOTOS BY Hynek Glos

The festival in 2023 saw memorable appearances by Russell Crowe (*L.A. Confidential, Master and Commander: The Far Side of the World, Gladiator*) and Robin Wright (*The Pledge, House of Cards*) Paradoxically when the actual festival is underway, Och himself rarely goes to screenings: because of his workload, he simply doesn’t have the time.

Anyone who imagines that the job of a festival artistic director consists of watching films and touring festivals around the world all year beforehand, only to then travel to a spa town to have drinks with film stars and lounge in cinemas, is mistaken. “It’s a mix of cinephilia and humility and the dedication to ‘roll up your sleeves’ and get down to brass tacks,” the KVIFF artistic director explains.

What got you interested in film studies?

There wasn’t any one moment or epiphany from, for example, a single film. When I was growing up in Světlá nad Sázavou, I became friends with the operators of the local cinema. They were a retired couple who ran the place in the mid-1980s. And I used to help out. I helped them check tickets, change broken bulbs, and so on. From time to time, I would look at the rental movie register where they reserved films for screening and got an idea how things were done. Also important for me was meeting Karel Čáslavský: he was a well-known film historian who was crucial for me and I was very impressed: I liked the way he managed to popularise the field. I met him once and asked him what it took to become a populariser, too. He told me that he didn’t know because he was self-taught. But he gave me good advice: to try the film studies department at the Faculty of Arts, where I did my entrance exam in 1992.

The first time, things didn’t work out, did they?

They didn’t. While I was a film buff, I was still an amateur at that point. I didn’t have enough experience. During the exam, we watched and were asked to review a film by Juraj Herz. That’s when I realised that my enthusiasm outweighed my expertise, and I didn’t even make it to the oral exams; I simply decided to walk away. Instead, I began studying law, which I stuck with for four years, although I ↪

didn't quite know why (laughs). And I spent a lot of time at the Ponrepo Film Club (a well-known art cinema – ed. note), where I caught up on thing that would be crucial for when I redid the exams later.

How did you get involved in the Karlovy Vary festival?
In 2001, I went to Paris on Erasmus together with my colleagues from the department. During my stay, I was offered the job of coordinating the transport of film prints for the festival. But I would have had to come back early from my internship, which I couldn't do, so I declined. Later on, I received another offer: this time for the secretary of the jury, which I accepted. As a result, I was thrown almost immediately face-to-face with many of the big names in world cinema, including the Polish director Krzysztof Zanussi or the persecuted Iranian filmmaker Jafar Panahi. It was a real jump into the 'deep end of the pool'! I must have done well, because after the festival Eva Zaoralová offered me the opportunity to join the KVIFF programme department. That was in January 2002.

How important was Eva Zaoralová, who held the post of artistic director before you and passed away last year, for you personally?
She played a key role in my life and career! When I started, I had a lot to learn, but the team was tight-knit and she led with authority. Working for her was an invaluable experience. She garnered natural respect and was someone to look up to. For me, it helped that I advanced through numerous job positions. I've been in charge of the video library, I had tried out office work and so on. Gradually, there were more and more opportunities to watch films – and to critique them. Later, I oversaw the section on documentaries at the festival, and soon there was a space for classic films and retrospectives as well, which were of deep interest to me.

Would a new employee today receive similar direction or mentoring from you?
Things don't always work out: at one point we hired a colleague who was already experienced as a programmer, who had worked for other festivals before and at a high standard. But while we appreciated his skills, it was clear that he was not really in synch with the rest of the team and our way of working. We are like a family; a personal association of people who spend time together not only at work but also outside of it, sometimes even on holidays. It fits the job, which for many is seasonal and for some of us is 365 days a year. It grows to such proportions that before the festival you are literally at work for seven days a week. To be successful, you have to share that commitment.

You took up the post of artistic director from Eva Zaoralová in 2011: what new challenges did you face?
It was a big responsibility. The room we are sitting in now used to be her office. She had a desk put in here for me and, essentially, we spent eight years here from morning to night discussing films, politics and our personal lives… The transition to a senior position was easier for me than it might have been otherwise since I could consult her on some of my decisions. At the same time, it was more challenging than anything I had done before. At the beginning, she was a very strong personality and although she decided to leave the position of artistic director herself, letting go of the reins was not easy for her. Gradually, we got used the new set up. As artistic director, you are part of the collective and contribute your opinion to the debate – but at some stage you have to make a decision and have to be able to explain or justify each film that ends up in the programme.

You refer to your work as "curating".
This term is mentioned quite often nowadays in connection with film festivals [as there is more and more content]. It can be tempting to become a filmmaker. Relatively inexpensive digital technology allows many to come close to realising the dream; in the last 10 or 15 years, the number of films we see each year has at least doubled. Moreover, the pandemic added countless new ways to watch movies, especially at home. The standard Karlovy Vary festival-goer with an interest in cinema doesn't have the time or resources to wade through it all. We are here to help the viewer find their way based on experience and knowledge.

How do you balance between having a film of high artistic quality while at the same time attracting some 1,200 people to Hotel Thermal's Great Hall?
That is a cardinal question. We are convinced that a film festival is like a gallery, where there should be space for the courage of filmmakers or auteurs who are not afraid to experiment and look for new ways of artistic expression, even at the cost of being harder to understand or reaching fewer viewers. But we also don't want to alienate filmgoers looking for something more accessible. Going back to when I took over from Eva Zaoralová, one of the changes I introduced was to move films for halls for fifty to a hundred people to halls for three or four hundred people. I guess I have slightly more alternative tastes and I think that is where they belong.

In 2022, you introduced the *Proxima* competition, at the same time another long-running competition, *East of the West*, came to an end. Should Proxima offer more alternative or challenging films?
The main reason was to end the period of territorial and political definition of the East of the West section, which was created in the 1990s with the idea of supporting films from a region that was undergoing a fundamental transformation. After several years of reflection – and looking at other major festivals, where the number of films from Central and Eastern Europe or the former Soviet Union was already quite high – we came to the conclusion that the task had been accomplished. At the same time, we heard the call of filmmakers to finally take them out of the "ghetto" and let them compete with filmmakers from all over the world. And so the definition of the second competition was rewritten, always keeping in mind young filmmakers who are not afraid and want to experiment. At the same time, we wanted to create a space for more mature directors who decide at some point in their career to try something different, to radically switch to a different genre, for example. All this is reflected in Proxima.

Over the years, you have met many important filmmakers, writers, directors and actors. Which meetings do you remember fondly?
Jim Jarmusch, who I got to know more personally at the Reykjavik festival. He is a great guy who – like us – loves film. He was ok with staying, like the rest of us, in a nondescript hotel, not in any of the luxurious places the organisers sent him. When I meet a filmmaker, I usually ask him about his favourite films and authors. I also wonder, if he were in my position, who he'd want to do a retrospective on. This usually cues passionate discussions and an exchange of ideas. That's what it was like with Jarmusch.

What about at KVIFF?
I'll mention the freshest of those Karlovy Vary encounters, and that was one of our guests in 2022, the actor Benicio del Toro, whom I've always liked for his charisma and acting bravura. He surprised us all with his knowledge of world cinema, including Czechoslovak cinema, which he demonstrated during the first evening, when we discussed not only Miloš Forman's films but also Menzel's *Closely Watched Trains* and others! He came to us with a three-page list of films he wanted to take back from the Czech Republic on Blu-ray discs. Equally enjoyable was meeting actress Julianne Moore, who was incredibly friendly and humble despite her star status.

Do you ever get a chance to run into the hall and watch a film alone during the festival itself?
That almost never happens. Sometimes my colleagues and I will schedule a late screening of a film we'd like to see with the audience on a day when there are fewer obligations, so that we can enjoy at least one film together. But that's really rather rare. Even if we wanted to watch more films during the festival, and had the time to do so, we wouldn't be able to relax. There is constant excitement and tension that would make even a short screening, long. There are just too many things at the festival that need our attention.

Karel Och graduated from the Faculty of Arts, Charles University in Prague. He is one of the most recognisable figures of the International Film Festival in Karlovy Vary. During the pandemic, Och was involved in the founding of KVIFF.tv, a streaming service specialising in art films. He and his team are currently preparing for the 58th edition of the festival in 2024.

The **irresistible** attraction of comic books

Comics have come a long way since they were introduced in the late 19th century. Over the decades, comic strips and books (or graphic novels) became more sophisticated, pushing and redefining artistic and narrative boundaries. Years ago, Petr Litoš - a graduate of CU's Faculty of Mathematics & Physics – co-founded comic book publisher CREW which is a powerhouse on the Czech market today. From superheroes to manga, he says, comics are here to stay.

STORY BY Jiří Novák PHOTOS BY Vladimír Šigut, CREW

What was the first comic you remember seeing?
Probably *Čtyřlístek* (see info box on page 54). When I was a kid, I lived one floor below the comic scriptwriter Ljuba Štíplová and I would occasionally get copies. She was brilliant and her catchphrases from the series are legendary today.

Is that when your love of comics began?
I always had a thing for computers and science fiction literature. Under totalitarianism, comics kind of went hand-in-hand with science fiction. There were various events where people from both genres overlapped. You had the writer Ondřej Neff, who used to bring comics from France, which is still a clear leader in Europe today. He was also a great friend and promoter of the cartoonist Kája Saudek, who was also a sci-fi fan. Mostly I got into comics through science fiction.

You started your first publishing house, Gryf, with your friends from the sci-fi club.
That was primarily devoted to philosophy at first. We published Nietzsche, Aristotle, Leonardo da Vinci, thinkers like that. Those were the days when we not only printed the books, but then we also delivered them to the bookstores ourselves in backpacks (smiles). I am talking about the year 1992, when I was fresh out of high school…

You continued your education at the Faculty of Mathematics and Physics of Charles University. You enrolled because of another passion, programming?
I had already begun programming in high school. My school, *Gymnasium U Libeňského zámku*, had

probably the best equipped computer room at that time. The headmaster had managed to get several MZ-800 computers from Sharp besides a big computer from what had been East Germany. At that time, our high school had the hallmark of being the best place to learn programming, with people there who knew how to do it.

Did your studies at CU meet your expectations?
I was happy that I was able to avoid physics, which I never really enjoyed. I was grateful for the combination of computer science and mathematics. And what I appreciated about the faculty was that it gave me a general overview, albeit sometimes things were trickier. What I mean is, you had to learn a number of marginal things that you didn't use in practice. However, in retrospect I see it as a benefit.

What did you do after graduation?
I already started programming professionally during school. Sometime during my second year I programmed systems for the microbiology laboratory at Na Homolce Hospital. The chief physician Vlastimil Jindrák and Dr Václav Vaniš knew exactly what they wanted. We were working with a lot of live data, and even with the help of the software I was working on, we managed to do amazing things; for example, it helped in reducing the consumption of antibiotics by as much as half. Dr Jindrak used the data to give lectures around the world and many scientific papers came out of it.

> We kept saying it would be cool to publish comics... and gradually a group of people emerged who were just naive enough to actually try.

The idea of starting a publishing house originated with your classmates from CU?
With completely different people I met through the science fiction community. We kept saying it would be cool to publish comics… and gradually a group of people emerged who were just naive enough to actually try.

You and these companions built the leader on the Czech market. How many titles a year are currently published under the CREW brand?
It's close to 230. Comic books dominate but we also do other publications and print runs. We do comics from game worlds (like *World of Warcraft*, *The Witcher*, *Cyberpunk 2077*) and together with the Ostrava publishing house Fantom Print we published several so-called "lorebooks" from these worlds. These are basically books that describe more about the different settings; you learn what deities they have and the worlds they inhabit. It's kind of closer to an encyclopaedia. We've even published two *World of Warcraft cookbooks*!

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Is it still true that the most bankable characters in comics is Bart Simpson?
For us, yes, but it's already being rivalled in some ways by some manga, comics from Japan, and also Pokémon, which is the most valuable license worldwide at the moment. They made three billion dollars in royalties last year alone – from comics, toys, books…

Besides Bart Simpson and Garfield, what are some of your *other* heavy hitters?
Definitely Japanese manga, and comics related to blockbuster TV series, like *Stranger Things* or *The Witcher*, which have huge audiences. The interesting thing about *Stranger Things* is that in the series, you have a character that disappears for most of the story and is somewhere in a separate reality. It's only after a while that he returns and narratively you are in the dark about where he was and what he experienced. And that's what the graphic novel is about. I think that's a big added value of comics when it's not just an adaptation. With *The Witcher*, again, it's about original stories. In the event what author Andrzej Sapkowski wrote or what you can play in the games isn't enough for you, you'll discover even more adventures in the comics.

Čtyřlístek

Čtyřlístek (Four-leaf clover) is an iconic Czech comic book series created by Jaroslav Němeček, which has been in print since 1969. It would be hard to find any child, as well as grown-ups, in the Czech Republic who, at some point or another, hadn't read at least some of the adventures of its anthropomorphic animal characters: Myšpulín, Bobík, Fifinka, Pinďa, and Myška – a talking cat, pig, dog, rabbit, and mouse, respectively. If you love comics and are young – or young at heart – the hugely popular series is not a bad place place to start.

We once wanted to fly a Japanese star over here and his publisher negged the idea, saying, "Forget it, he's not going anywhere, he can't make it. Only when the project is over."

I've read about the pitfalls of your efforts to acquire the rights to Japanese manga. It doesn't sound easy…
You have to be patient when working with the Japanese: they have a lot of time for everything, so to speak. Whereas Europeans and Americans are all about getting down to business when there is a common ground or incentive, the Japanese will say, "Fine, but let's get to know each other better first." And then you exchange emails with them half a year, maybe even a year, and learn about how they went tuna fishing and you tell them about how you vacationed in the Giant Mountains. When a year goes by and you want to get back to business, maybe the person who was in charge has since been replaced and is no longer there – that really happened to me! There are titles that I have continuously applied for over ten years!

Is it common for an author to illustrate their story or is that more of an exception?
It's not that unusual. In Europe it's quite common, in America and Japan it's less, maybe half. Having the talent for both is not a given. The European comics industry is very author-driven, which is not to say that writers aren't under deadlines but the biggest names have more freedom and can spend more time creating. In America, 22 pages have to come out every month to get a new comic on the shelves on time. And at that point, you're already putting the author under pressure. There's a division of labour, which I don't think is a bad thing: the American writer writes the story, the artist draws the story in pencil, he or someone else outlines and inks it, someone else adds the colours – often there are two colourists – and someone else adds the letters…

What about in Japan?
There, as an author you turn in a whole chapter once a week or once a fortnight, and you're expected to turn in something like 15 or 20 pages. It may be signed by one person, but in reality it's a team of as many as 20 people! It's not uncommon for the publishing company to rent a large apartment and have them all live together so that they have maximum time to work. The author basically just sketches it out, then there's a specialist who just draws buildings, another who specialises in cars, someone who draws rain, and so on… In Japan, magazines are published in the millions of copies, where there are, for example, 20 chapters of different stories, and every week the readers rate what they like and don't like. And if there's something they don't like, the publisher tells the author, "You have three more chapters, then wrap it up." And instead they put out something new with potential.

That said, if something gets a lot of attention, the story can swell to 700 chapters! At that point, the author's stuck with it. We once wanted to fly a Japanese star over here and his publisher negged the idea, saying, "Forget it, he's not going anywhere, he can't make it. Only when the project is over." Japanese authors are victims of their success, and it's not uncommon for them to destroy their health and not live to an extra-ripe age.

Are there any Czech authors with the skills to make it abroad?
It's hellishly hard, the competition is huge. However, Štěpánka Jislová was published by the quite renowned French publishing house Glénat, and Lucie Lomová's works are also published in France, and now and then someone else gets through. We have also helped sell a few Czech authors who were originally published by CREW. There are people in the Czech Republic who can make a living from comics now, which wasn't the case 10 years ago. But they're few and the proceeds won't be enough to buy a Ferrari (smiles).

Superhero comics have been coming out since the late 1930s. Is it even possible to come up with something original, still?
I see something new every once in a while and ground-breaking works are being created all the time. With Batman, for example, I dare say that almost every two years there's a big hit where you think "That's a big story! Somehow they did it again!" You can always come up with stories or new character interactions.

Petr Litoš graduated from the Faculty of Mathematics and Physics of Charles University. In 1997, he co-founded the CREW (pronounced *krev* like the Czech word for *blood*) publishing house with the aim of publishing international comic books and graphic novels in Czech. CREW has been a long-standing partner of brands such as Marvel, DC Comics, Image and Dark Horse, and also holds licenses for Japanese manga and European works. It is one of the five most impactful publishers on the Czech book market, and by far the most productive in comics.

Comics are a thing you have to *feel*. It's quite rightly a separate medium, and it has something of film, and something of literature. It's amazing how you can change the pace of the narrative: it's said that in comics most of what happens is outside the pictures themselves – in fact, it's what happens between the two frames. Take six pages of action where the hero just pulls out a gun, puts a clip in it, and a bullet flies. What do you do? You can slow it down or speed it up. There can be a lot of text or dialogue or just a little or none. Pace is very important and comics also have a strong ability to evoke and convey emotion.

What drives you as a publisher going forward?
It's still fun! It's not about publishing the most famous title, it's about spreading the world of comics further and further, that's what Jiří Pavlovský and I went into it for back in the day. That's also why we don't do any collector's editions. There is nothing wrong with them but instead we try to appeal to the mass market, and the greatest satisfaction for us is when a nice bookstore no longer has just one shelf, but a whole section for comics – and not just ours.

The revolution was a period of of **collective** effervescence

November 17 is Struggle for Freedom and Democracy Day, commemorating students and others who protested against the Nazi occupation of Czechoslovakia in 1939, as well as students 50 years later – in 1989 – who were savagely beaten by the Communist riot police. The violent incident sparked the Velvet Revolution that would bring down Communism in Czechoslovakia.

STORY BY Jan Velinger PHOTOS BY Tomáš Turek, Přemysl Hněvkovský, Monica Michelle

On the occasion of the anniversary this year, I spoke to historian James Krapfl – the author of the acclaimed *Revolution with a Human Face: Politics, Culture and Community in Czechoslovakia, 1989–1992*, Cornell University Press. In his book he argues the revolution was distinctive in its ideals of humanity, humanness and non-violence.

The cornerstone of your study focuses on 'citizens' as opposed to many of the more recognisable players – why?
The reason is simply that democracy cannot exist without participation of the *demos*. The democratisation literature of the 1990s largely ignored citizens, as if the establishment of democracy were merely a matter of revising constitutions, reforming institutions, and holding elections – a very top-down perspective. Early histories of the revolutionary transformations of 1989 – not just in Czechoslovakia – likewise tended to focus on "leaders" and other elites, whether revolutionary, Communist, or international, reducing the millions of mobilised citizens to colourful window-dressing. Democracy doesn't just sweep in like the sea, nor can it be produced simply by changing written constitutions; it has to be created from below.

Is it easier to articulate more elite narratives than the story of 15 million people?
I would say it has to do with interpreters' conceptual schemes – how they're equipped to perceive reality – and specifically with where they perceive agency to lie. If you believe that the most important decisions are usually made by an elite, that's the social group you'll privilege in accounting for historical change, especially in the short term. An alternative is to believe that impersonal structures constrain our decision-making – to the extent that it's less important to speak of human agency than of these structures. Of course, impersonal structures and powerful individuals often do play decisive roles in history, but it is wrong to suppose that "ordinary" people do not. Particularly in revolutions and other times of collective effervescence, when leaders are themselves often following the crowd, it is a mistake to ignore popular agency.

Your book covers the period from 1989 to 1992. At what point were the 'ideals' of the Velvet Revolution at their 'purest' or most focused?
Those who participated in the revolution experienced the period of the student strikes – from 18 November 1989 to 3 January 1990 – as transcendent. Participants described a time of miracles, rebirth, or resurrection, a time outside of time, or what anthropologists call a liminal period, which in this case can also be described sociologically as a period of collective effervescence. As I show in the book, the events of 17 November were like the Big Bang, for they gave rise to an expanding universe

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of signifiers. Consciousness shifted, people acquired a new sense of what was meaningful, and as a Slovak journalist wrote, "suddenly we all want to assemble as much as possible, to listen as much as possible, and to speak as much as possible." In doing so, citizens collectively produced new symbols to represent their newfound sense of community, and they collectively articulated the ideals of what they explicitly called "a new society."

These ideals were constantly being developed and refined, but during these weeks they exhibited a remarkable coherence, and there was also remarkable agreement about most of them. There was no single document that encapsulated them all, but by studying the thousands upon thousands of documents that citizens themselves produced in November and December 1989, it is possible to recognise the ideals that gave them coherence and united those who signed them.

Did you yourself have previous ties – or roots – to Czechoslovakia?
My family's roots are in central Europe, though not in the lands that became Czechoslovakia. Nonetheless, when I first arrived there in September 1992, I experienced less culture shock than when I had moved from Iowa to California to attend Stanford University. The first two weeks were difficult, of course, knowing only the rudimentary Czech I had managed to teach myself over the previous summer – at a time when very few people spoke English – but very quickly I came to feel at home.

Olomouc and Trenčín, where you lived at different points, are smaller towns so it must have been different than being based in Brno or Prague.
I spent some time in Prague as well – having spent the first half of my study-abroad semester in 1992 at Charles University before moving to Olomouc for the second half, and I came to Prague again for two Czech-language summer schools at CU, but I chose to return to Olomouc when I received a Fulbright scholarship in 1996, in part because it was easier to meet people and improve my Czech there. To understand what life is like for most Czechs and Slovaks, moreover, it's necessary to live outside the capitals, which are more exceptional than emblematic. ↪

I suppose things were still quite fresh then and that the dust hadn't settled…
There was still a revolutionary atmosphere in 1992 – the fate of the federation was in question, after all – and among my peers at Charles and Palacký universities there was a tremendous excitement about the future. I was fortunate to able to "breathe in" the atmosphere surrounding the Czech and Slovak elections of 1998, the *Děkujeme, odejděte* (Thank you, now leave) movement of 1999, accession to the EU, and so on. For a historian, at least, an exciting thing about central Europe is that history is always happening.

What were other elements that formed the backbone of your book?
As a cultural historian, what interests me most is the history of the webs of meaning that are culture in the broadest sense. While I was based in Olomouc in 1996 I discovered the revolutionary flyers or *letáky* that had been such an important medium for the formation of public opinion in 1989. A student at Palacký University told me about them, and on a visit to Opava I discovered that the district archive there had a collection. I then started systematically visiting archives, mostly in Moravia and Silesia, but some in Bohemia, to study and wherever possible photocopy these materials. Some former student strikers even shared their collections with me.

I also discovered student and local Civic Forum bulletins through this method. By the time I started my M. A. in Budapest I had roughly 2,000 documents, which allowed me to chart almost from day to day how citizens' thinking changed. When I conducted the research for my doctoral dissertation in 2004–05, I supplemented my earlier research with visits to archives across Slovakia and Bohemia, together with a few in Moravia I had previously missed. I also gained access to the very rich archives of the coordinating centres of Civic Forum and Public against Violence in Prague and Bratislava.

James Krapfl teaches modern European history at McGill University. He is the author of *Revolution with a Human Face: Politics, Culture, and Community in Czechoslovakia, 1989–1992* (Cornell, 2013), the Slovak edition of which was published in 2009; Karolinum Press is currently preparing a Czech edition. Krapfl is co-editor of the journal *East European Politics & Societies*, having previously edited *Canadian Slavonic Papers*. He acts frequently as a consultant for the European Commission.

You have spoken about the language and ideals of the early days as being 'romantic'. But I guess an unprecedented moment like 1989, with hope for a better world, was romantic by its very nature?
The romantic frame posits a world where extraordinary things can happen, where actors are capable of heroic deeds, and where one side in the struggle that motivates action is clearly good. The violence of 17 November established a clear difference between non-violence and violence, good and evil – and it was itself outside of the ordinary experience of most participants, as well as of those who heard about it. For those shaken by this violence into taking action, the romantic frame was the natural way to make sense of the situation. It reflected a newfound sense of meaningfulness.

What were dominant aspects of this particular revolution that set it apart?
Logically the most central ideal of the revolution was *lidskost*/*ľudskosť*, which can be translated as humanness or humaneness, depending on the context. Other revolutionary ideals were justified with reference to this one. In the "new society;" citizens and institutions would respect individuals' human dignity, they would not be reduced to their roles in some system to borrow language from Havel's essay "The Power of the Powerles". As electricians from a Stonava mine wrote, "We believe that the era of manipulation with human opinions is finally at an end, and now workers will be able not just to work, but also to feel, to believe, and to think." Non-violence was a closely related ideal, meaning rejection not just of physical violence, but violence in all its forms, including psychological, economic, and environmental violence.

In my book, I argue that Czechoslovak thinking about human dignity and violence in 1989 was innovative in comparison with earlier revolutions in European history, even though similar ideas have always figured in revolutions. First, Czechs and Slovaks elevated humanness and human dignity above ideology, insisting on not losing sight of human reality regardless of what rules, procedures, or other man-made systems might dictate. Second, in situating itself against violence as such, rather than approving one kind of violence in order to combat another form, the Czechoslovak revolution went further than previous revolutions in getting to the heart of the problem that has bedevilled human society from time immemorial: our own violence, and the way we use violence to create and maintain meaning.

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It is worth noting that citizens in the revolution also articulated an innovative vision of blending representative and direct democracy, political and economic democracy. Some of their ideas, like procedures for holding referenda or sizable student representation in academic senates, came to be realised, while others eventually fell by the wayside. It was remarkable, moreover, that citizens who joined the revolutionary movement from the very beginning emphasized democratic practice, creating in their local milieux a culture of democracy that remains recognisable today.

What is the most pervasive myth about the Velvet Revolution that you reject?
Perhaps the worst myth is that the revolution was just an instant, or that it ended with Havel becoming president at the end of December. One of the greatest tragedies of the revolution was that many people thought it was over when really it was just beginning. Revolutions are not just about the demise of an old regime; more importantly they're about the reconstitution of society and the institutions that represent it. This process necessarily takes years. By thinking at the beginning of 1990 that victory was assured and that it was safe to leave the public sphere and focus on enjoying newfound freedom, many people discovered to their dismay that crucial decisions ended up being made without their input. It's also important for us today to remember how complex and uncertain the time of revolution was. Reducing it to an instant, as the annual commemorations in Prague now tend to do, contributes to the erasure of individual citizens from the history of the revolution. It's important to remember the choices they faced at the time, how they overcame divisions within society, how they struggled to create a democratic society from below. Only thus can the experience inform our decision-making in the present.

In my view, the entire period from 17 November to 3 January should be considered "the early days of the revolution," since the revolutionary process was by no means over then. People still spoke of "completing" the revolution in the early 1990s, and I would say that the process of reconstitution that began in November 1989 continued until 2004, when the Czech and Slovak Republics joined the European Union. We might compare the American revolution, which began in 1774 but arguably lasted until the ratification of the federal Constitution in 1789.

Opening the door to EU institutions

31/1 How can CU students or graduates build towards a career in EU institutions? Thanks to the Gateway to EU Institutions preparatory course, which was officially launched in the Carolinum with participation of EU Commissioner Věra Jourová, new opportunities are likely to become available. The new course was the result of cooperation between Charles University and the Prague University of Economics and Business.

Life at CU

21/2 Ahead of the first year mark of Russia's attack on its sovereign neighbour, Ukraine, CU's Faculty of Social Sciences focused on the conflict and its repercussions felt across borders. The conference compared Russia's aggression to historical milestones such as the invasion of Czechoslovakia on August 21 or the September 11 terrorist attacks. "Our society experienced a profound shock and is currently grappling to cope," said Dean Tomáš Karásek – a sentiment also echoed by other speakers on the eve of the first anniversary. CU has repeatedly shown its solidarity with Ukraine, increasing cooperation and offering help wherever possible over the course of the conflict.

Faculty of Social Sciences holds conference on Russia's war in Ukraine

Charles University celebrates 675 years

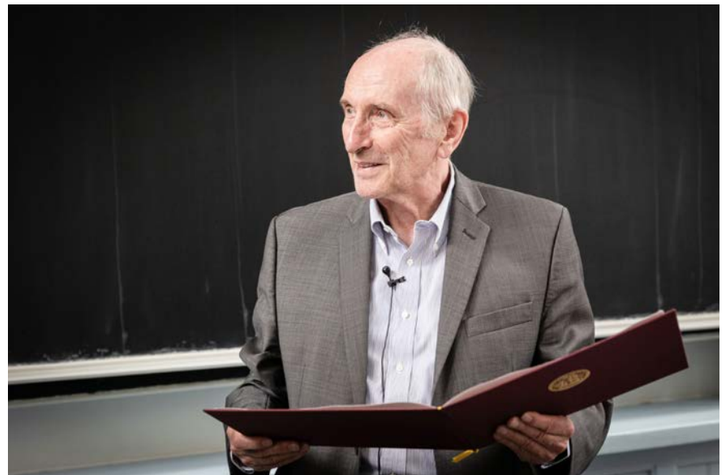
5/4 The Great Hall of the Carolinum hosted a festive event commemorating the 675th anniversary of the founding of Charles University (on 7 April 1348). On the occasion, many personalities of Charles University received top recognition, for example the Miloslav Petrušek and the Bedřich Hrozný prizes.

Company Days at Faculty of Mathematics and Physics

26/4 "The Faculty of Mathematics and Physics aka. Matfyz is extremely important for us," agreed participants in this year's Company Days fair, which was organised by the faculty at Charles University for the second time. This year, the two-day event was attended by 53 companies from sectors related to mathematics, physics and IT.

Renowned author Smil makes rare appearance at CU

23/5 University professor, science promoter and writer Václav Smil was honoured by the Faculty of Science of Charles University – his alma mater – and the Czech Geographical Society. There was room for an interesting debate in the geology lecture hall. Many of Smil's popular science books tout an endorsement from none other than Microsoft founder and philanthropist Bill Gates.



Key ombuds conference held at Carolinum

14/6 Ombudswomen and ombudsmen from Europe and further abroad were hosted by Charles University as part of the eighteenth annual ENOHE conference. Together, they and other attendees sought ways to improve safety for all within the academic environment.

New president welcomes newly-named professors

21/6 President Petr Pavel handed over appointment decrees to professors in the Great Hall of the Carolinum – the historic heart of Charles University. Thirty new appointees were from Charles University alone.

Charles University rector begins presidency of CRC

1/8 1 August Professor Milena Králíčková began her two-year post as the head of the Czech Rectors Conference (CRC), which she took over from Martin Bareš, the rector of Masaryk University.

A unique archaeological find!

25/9 An expedition of the Czech Egyptological Institute of the Faculty of Arts of Charles University made a rare discovery: it found and explored a lost tomb belonging to a high official who lived about 4,500 years ago.

Researchers' Night draws even more visitors

6/10 This year's Czech European Researchers' Night attracted twice as many people to the buildings of Charles University as the previous year. In total, the CU team prepared over a hundred programme items – one-fifth of events offered on the evening at various schools and institutions across the Czech Republic.

Celebrations include Oxford vice-chancellor visit

17/11 On 17 November, International Students' Day as well as the Struggle for Freedom and Democracy Day was marked by representatives of Charles University, who honoured the students' struggle for freedom in 1939 and 1989. The guest of honour was Oxford University Vice-Chancellor Irene Tracey. During the Second World War, Oxford provided a refuge for many Czechoslovak students.

One of **300**

The protective gear alone is impressive but just wait until you witness two opponents go at each other. With fluid sword movements reminiscent of the ancient samurai, competitors shout and strike. Such is kendo. And such is a student of the Faculty of Medicine of Charles University in Hradec Králové, Nikol Eichlerová. The European Champion.

STORY BY Jiří Novák PHOTO BY Michal Novotný

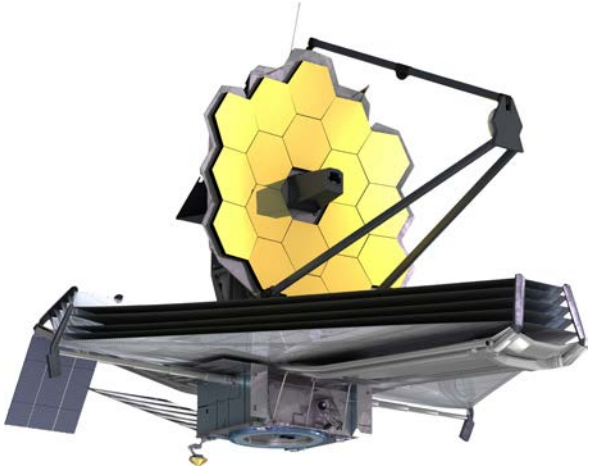
Before Nikol had time to learn and try different sports as a child, she was captivated by kendo, which her father introduced her to when she was seven years old. Before long, the martial sport grew on her and she didn't need to try any others, not even fencing. "I didn't find it very action-packed, and compared to kendo it's a bit too neat," she says. Match-ups in kendo are very fast-paced, with opponents striking at designated parts of the body. Their fierceness is accompanied by loud shouts as their swords clash.

"Each strike has its own name in Japanese, and that should be shouted during the lunge. You shout to intimidate your opponent, and you shout the name of the strike you performed," Nikol explains.

The kendo blade, known as a *shinai*, is a bamboo sword constructed specifically for practice and competition. It's made with several bamboo staves bound together to form a flexible yet durable weapon. Its correct size and weight are carefully checked at tournaments. Protective equipment consists of a helmet, gloves, torso protector and hip protector. Kendo competitors wear a *keiko-gi* coat and wide *hakama* trousers, usually dark blue in colour, but sometimes white or black.

Could her championship gold lead her to become a professional athlete? "No, you can't make a living with the sport here. I would have to live in Japan," Nikol admits. Kendo has over a million members in its home country and is even a compulsory sport in primary school. "In the Czech Republic there are about three hundred of us," the champion says with a laugh.

Nikol Eichlerová is a student at the Faculty of Medicine of Charles University in Hradec Králové. She has been practicing the Japanese martial art of kendo for almost 15 years and is a national team member. After winning a bronze team medal at the Junior European Championships (2016), she won a historic gold for the Czech Republic in the senior category in 2023 in Beauvais, France.



The JWST launched on 25 December 2021 and travelled to a point known as L2 some 1.5 million kilometres away, from where it orbits the Sun. The observatory sent its first photographs on 12 July 2022. The results have been exceptional from the start and are transforming our understanding of stars, galaxies, and the early Universe.

The Czech contribution
to NASA's JWST mission **22**