University of Basel

UNI NOVA

University of Basel Research Magazine — N°137 / May 2021

Remembering and forgetting.

In conversation
Democracy in the digital maelstrom.

Debate
Can Switzerland stamp out COVID-19?

Album
Virtual papyrus puzzle.

Essay
The philosophy of the crisis.

Team

Contributors to this issue

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1 Astrid Nippoldt has been drawing portraits for UNI NOVA since 2015. In this issue, she has provided an illustrated infographic to accompany the dossier. She is a video artist and illustrator at Studio Nippoldt in Berlin, which she co-founded in 2012 together with her brother and sister-in-law. Pages 14–35

2 Andreas Papassotiropoulos is Professor of Molecular Neuroscience and heads up the Transfaculty Research Platform Molecular and Cognitive Sciences together with Dominique de Quervain. One of his current research projects focuses on people who remember every single day of their lives. He also provided research support for the infographic in the dossier. Pages 19, 14–35

3 Isabelle Marthot-Santaniello researches ancient history in the Department of Ancient Civilizations. For this issue, she agreed to a photo shoot on her first day back from maternity leave and showed us her work with ancient papyrus fragments. Pages 40–49

What we retain.

Do you remember how natural, how comparatively tranquil everyday life was before the coronavirus pandemic? What parts do you recall most fondly? Is it your travels, your gatherings with friends, complete with a hug and a kiss on the cheek, or is it the concerts, parties and festivals? And when the global crisis is finally over, what will you remember from this time?

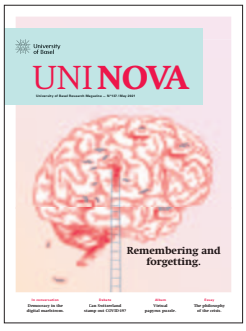
Nobody is going to forget this pandemic. It will become a facet of our memory, a part of our past that shapes the picture we paint of ourselves. It is to this ability we possess – to retain experiences and information as well as to tidy up the archives of our minds – an ability so central to our lives, that we dedicate our current issue. Here, we examine research projects on early childhood memory and on people who are unable to forget. We showcase methods and means of bolstering our working memory as we age or if we are affected by mental illness and explore tests that can detect dementia in its earliest stages. But memory encompasses more than just the storage capacity of our brains. For example, how can the body remember past infections in order to mount an immune response? How is our justice system shaped by the statute of limitations and by forgetting? And is there really such a thing as collective memory?

We hope this proves to be an enjoyable – and memorable – issue.

Angelika Jacobs,
UNI NOVA editor

e-ID, e-voting, e-democracy? Legal scholar Nadja Braun Binder in conversation, page 8

Memory: an archive constantly expanding, shifting and shrinking



Cover illustration
Remembering is a complex achievement of the brain. However, it is just as important that some things disappear again. (Drawing: Astrid Nippoldt)

Dossier

Remembering and forgetting.

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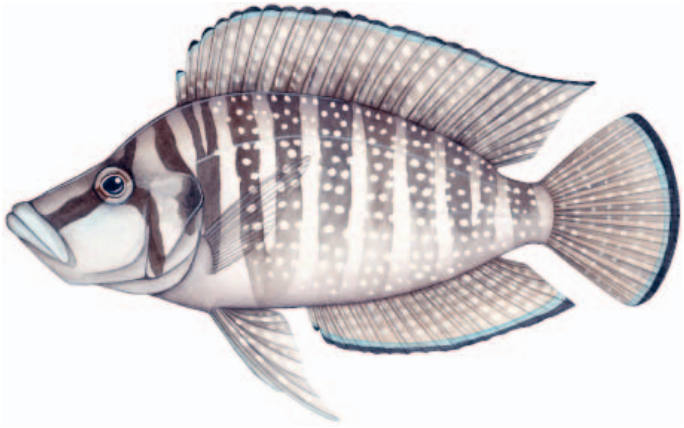
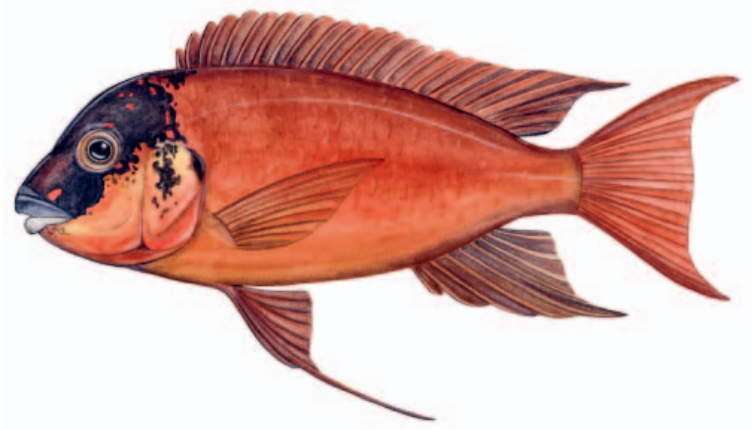




Evolution

“Frankenfish” paintings.

Professional-quality photographs are often only a shutter click away. In research, however, drawings sometimes trump even the highest-resolution images, as they are often better able to capture the coloration and characteristic features of the species being studied. The illustrator who drew these cichlid fish from Lake Tanganyika in Africa for the Basel University research group “Animal Diversity and Evolution” likes to call them “Frankenfish”. Like Frankenstein’s monster in the famous Gothic novel, each one is assembled from a number of different sources: specimens from Professor Walter Salzburger’s collection, underwater photos taken by researchers in which the fish are often at an awkward angle or out of focus, and photos of fish immediately after being captured. Based on this material, scientific illustrator Julie Johnson was able to accentuate the particular features highlighted by the research team. The result is a set of 240 breathtaking watercolor paintings of cichlids from Lake Tanganyika. ■

"The hype has given way to skepticism."

On social media, lies, half-truths and accusations spread like wildfire. That means it poses legal challenges for a democratic society, says Nadja Braun Binder, Professor of Public Law at the University of Basel.

Interview: Urs Hafner Photo: Oliver Hochstrasser

UNI NOVA: Professor Braun Binder, this March at the ballot box, the Swiss public roundly defeated the proposed measure to introduce e-IDs, or electronic identification. Were you surprised by this decision?

NADJA BRAUN BINDER: I was expecting this question, and I hate to disappoint you, but as a public law specialist, I have to say that no, I was not. Every vote ends with a "yes" or a "no."

UNI NOVA: Well then, let me ask the question to you as a private citizen …

BRAUN BINDER: Even then, I'm not particularly surprised. Twenty years ago, there was great hype in Switzerland about this new concept of digital democracy. Back then, the focus was on introducing "e-voting" with electronic elections and voting. Geneva, Zurich and Neuchâtel launched pilot projects, and in the end, some 15 cantons got involved. The legal foundation for the process is now clarified, but it hasn't yet been implemented in any substantial way. We're still voting by mail and putting pen to paper to sign referendums or initiatives.

UNI NOVA: Why wasn't e-voting successful?

BRAUN BINDER: Due to the technical challenges and the difficulty in testing the electronic voting systems for conformity. Both aspects were underestimated. When it comes to our democracy, we would be putting public trust at stake, so there is no room for error. Over the past few years, the media have become increasingly critical of these changes. Meanwhile, the hype has given way to skepticism, and that was a contributing factor.

UNI NOVA: Does this skepticism extend to the e-ID, too?

BRAUN BINDER: I don't think so. Even opponents of the solution in question support the general idea of an e-ID, but here again, the implementation process remains controversial. It's clear that a majority of voters do not support the adoption of a private commercial solution, but the e-ID itself is on the horizon. The canton of Schaffhausen is already offering one. On top of that, at the beginning of the year, their cantonal council approved the proposal to introduce collecting electronic signatures for initiatives and referendums. The e-ID seems to have paved the way for digital signature collecting. Schaffhausen could become a pioneer for Switzerland. Federalism often tends to promote provincial attitudes and disputes between cantons, but it can also spur innovation because of the freedom it grants the individual cantons.

UNI NOVA: Would you call yourself a proponent of digital democracy?

BRAUN BINDER: I'm afraid that's the wrong question. As a legal scholar, I neither support nor oppose measures such as e-voting.

UNI NOVA: So, you draw a strict line in the sand between your work as a scholar and your personal opinions. But don't your political persuasions inevitably have an impact on your research?

BRAUN BINDER: Of course, I have an opinion on the topics I study, but it's not the aim of my research to take a stand on a particular issue. Instead, I focus on the legal considerations: For me, the question is whether our democracy will be able to safeguard voting and electoral freedoms even in the era of social media and fake news or rather what legal instruments need to be put in place to protect those freedoms. The government has to guarantee that voters are able to form their own, independent opinions. They shouldn't be influenced by illegal practices. When false information makes public discourse impossible, the authorities are obliged to intervene. For Switzerland, which has a long tradition of holding referendums with a significant impact on our national political apparatus, it is crucial for the authorities to uphold their responsibilities to provide voters with the information they need and intervene when necessary.

“When society changes the way it communicates, democracy changes with it.”

Nadja Braun Binder

UNI NOVA: So, the state is obligated to censor Facebook, for example, if a user posts false claims about the number of women who wear burqas in Switzerland?

BRAUN BINDER: The state isn't licensed to simply curb free speech as it is in China. Switzerland's voting and electoral freedoms, together with our fundamental rights on communication (such as freedom of speech etc.) are designed to protect both democracy as a whole and private citizens individually. Of course, individuals aren't permitted to make criminal claims or infringe on the personal rights of others, but in the context of a political debate, they are allowed to simplify or exaggerate their opinions, to express those opinions anonymously and even to lie.

UNI NOVA: Where do we draw the line between the legal expression of an opinion and infringement on electoral freedoms?

BRAUN BINDER: That is the question we have to address when it comes to social media. Up to now, the law tended to draw that line at the point where false and misleading information was presented so late in the course of a political debate that voters no longer had enough time to garner a factual, reliable understanding of the issues. In 2009, the Federal Supreme Court of Switzerland decided that an erroneous document, which first surfaced during the municipal assembly, hindered the ability of the voters to form balanced opinions and consequently impinged upon their electoral freedom. The decision of the municipal assembly in question was repealed.

UNI NOVA: Of course, social media has its own concept of timeliness. An old post can surface out of nowhere and unleash a whole new wave that reaches enormous numbers of people.

BRAUN BINDER: That's very true. It's why we have to reconsider the precedent that the misinformation in question must be shared close to the date of an election. Even more crucially, in my opinion, is the issue of whether, after being exposed to misinformation, voters are even able to form an undistorted opinion when presented with information from other sources. If not, in some cases, the court may be obligated to annul the results of an election. This kind of treatment could end up being preventative and help stop the spread of highly misleading information in the first place.

Nadja Braun Binder
has served as Assistant Professor of Public Law at the University of Basel and as a member of the Diversity Committee for the Faculty of Law since 2019. Prior to that, she was assistant professor at the University of Zurich and at the Centre for Democracy Studies Aarau. The main body of her research focuses on state and administrative law as well as European law in the age of digitalization. Nadja Braun Binder earned her postdoctoral degree at the German University of Administrative Sciences Speyer. Braun Binder is currently carrying out a study on digital democracy on behalf of TA-SWISS and conducting another study on the use of artificial intelligence in public administration on behalf of the canton of Zurich.

UNI NOVA: We've been living with the Internet for almost thirty years now, but political lies are nothing new. Before, they were simply disseminated through traditional partisan media.

BRAUN BINDER: Correct. That's why lawmakers introduced the partial ban on political advertising in radio and television, which has been in place for some time now, to prevent wealthy groups from influencing the democratic decision-making process. Furthermore, the law penalizes defamatory, discriminatory and slanderous claims as well as hate speech. The difference with the Internet is that social media now provides people with an unprecedented platform for disseminating lies and half-truths – traditional media never had that kind of reach. On top of that, social media hosts both private users and users acting on behalf of state agencies. The last US president used Twitter to bombard the world with innumerable lies.

UNI NOVA: Is democracy taking place on social media now?

BRAUN BINDER: We're not in China, and we're not in the United States, either. Most people still consider the explanatory pamphlet published by the Federal Council as one of their most valued sources of information; there are very few people who get all of their information online. But that's an area that needs further research.

UNI NOVA: You're on Twitter, too. Have you ever experienced hate speech?

BRAUN BINDER: No, fortunately not. It is distressing to see how quickly a throwaway statement can turn into a scandal and a justification for bullying – and how much hate is brewing away online.

UNI NOVA: Do we need a new law to regulate the contents of social media?

BRAUN BINDER: When it comes to safeguarding our democratic processes and mechanisms prior to elections and referendums, I don't see the need for additional regulation at present. Our systems are working just fine and are subject to legal protections. In my opinion, it's more proportionate for us to apply existing legal provisions within the margin of appreciation that is there rather than to introduce general prohibitions, for example a ban on anonymous posting. Anonymity provides members of marginalized groups with the freedom to share their opinions in electoral debates without having to fear repressive retaliation.

UNI NOVA: Does social media pose a threat to democracy as an institution, or does it open up new opportunities?

BRAUN BINDER: Both! Democracy is not a rigid concept; it's designed to change. When society changes the way it communicates, democracy changes with it. That can be an opportunity. For example, social media gives groups of people without significant financial resources a platform where they can be heard. And paradoxically, the Internet not only lends itself to the dissemination of false information – it's also very well suited for correcting false statements. It is a space for lively debates and offers endless information. But these opportunities need to be accompanied by the appropriate legal measures. Digital development is an unstoppable

force, just like the introduction of women's suffrage, thankfully!

UNI NOVA: Of course, Switzerland was very late to implement that particular change. Do you think we're struggling with the same inertia when it comes to digital democracy?

BRAUN BINDER: I don't think so. We were ahead of the game when it came to e-voting, and now we're well on our way to deciding how best to handle the impact of social media on political processes prior to elections or referendums. I'm heartened by the fact that we aren't being hasty in our decisions to impose regulations; we're making sure that any measures are sound and well-founded. That's consistent with our tradition of direct democracy. We are accustomed to the idea that we have to take a nuanced approach to problems.

UNI NOVA: Sometimes the Swiss public isn't very amenable to nuance; when it comes to questions such as the ban on minarets and head scarves, those decisions seem rather irrational indeed.

BRAUN BINDER: Personally, I was very discouraged by the results of those referendums, but here, too, it's important to differentiate between two separate issues: the commitment to the democratic process itself and the results of that process. Of course, every system can be improved. For example, we could certainly discuss the way we currently incorporate the majority vote of the cantons in the referendum process. However, if a particular mechanism is sanctioned by the constitution, we have to live with the decision, whether we like it or not. And in retrospect, some decisions take on new meanings that would have been impossible to see at the time the referendum was passed. I think it's good that we have popular initiatives to serve as a pressure valve in our democracy.

UNI NOVA: Is social media a pressure valve, too?

BRAUN BINDER: Absolutely. Any means of sharing opinions publicly constitutes a type of pressure valve.

UNI NOVA: Social media also poses a challenge to democracy. Who was the first to understand this fact – was it the academics or the politicians?

BRAUN BINDER: Parliament saw a number of early proposals on the topic of electronic participation and digital democracy. The political establishment is sensitive to the way social developments can affect democratic processes. At the same time, since the very birth of the Internet, researchers have been discussing its potential for democracy.

UNI NOVA: What first piqued your interest in the subject?

BRAUN BINDER: This is an issue I've been studying for twenty years, since I started writing my licentiate thesis on e-voting at the University of Bern. That paper was likely the first legal treatment of the topic in Switzerland. It brought me into contact with the Federal Chancellery, where I started my first job after I finished my studies. My dissertation focused on secret ballots and e-voting, and I did postdoctoral research in Germany, where I studied digitalization in state and administrative agencies. ■

Climate action

From planes to trains.

Before the pandemic, air travel accounted for around half of the total greenhouse gas emissions caused by the university. Accordingly, this is an area with huge potential for carbon savings. The university has pledged to slash its greenhouse gas emissions from official flights by 30 percent – and intends to do so by reducing the number of flights taken rather than by recourse to offsetting schemes.

To achieve its goal, the university is working closely with the faculties and departments to develop measures to reduce air travel without compromising exchange between researchers. Besides virtual meetings and conferences, the alternatives under consideration include taking short and medium-distance trips by rail instead of air. ■

New premises

Biozentrum poised to relocate.

Transparency and natural light abound in the design of the spacious entrance hall of the new Biozentrum.

The finishing touches have yet to be completed, but the end is in sight. At the start of this year, ownership of the new Biozentrum building was transferred from the two Basel cantons to the University of Basel, bringing the three partners' largest building construction project to date a step closer to completion. The first occupants to take up residence in the new premises will probably be scientific instruments. In order for research to proceed seamlessly at the new location, the sensitive equipment will first of all have to be tested and optimized.

The long-awaited relocation to the ultra-modern research building will then also begin for staff in the summer: In stages, around 400 researchers will move into their individually equipped laboratories distributed over ten floors. At the start of the fall semester, teaching rooms and lecture halls with a capacity for 900 students will also be ready for use. ■

Doctoral program

EU cash injection for immunology.

A new doctoral program launched by the Eucor alliance will enable 28 researchers to continue investigating the fundamentals of how our body fights pathogens. The European Commission has approved around 3 million euros in funding for the initiative. Besides the University of Basel, participants in the "Eucor Upper Rhine Immunology doctoral programme" (EURIdoc) include a number of universities and hospitals in Freiburg, Strasbourg and Karlsruhe. In addition, the doctoral candidates can undertake research placements at leading pharmaceutical companies and medium-sized firms. The program focuses on the development of the immune system, innate and acquired immunity and immune disorders. EURIdoc is also devoted to fighting the most pressing immunological problem of our time – COVID-19. ■

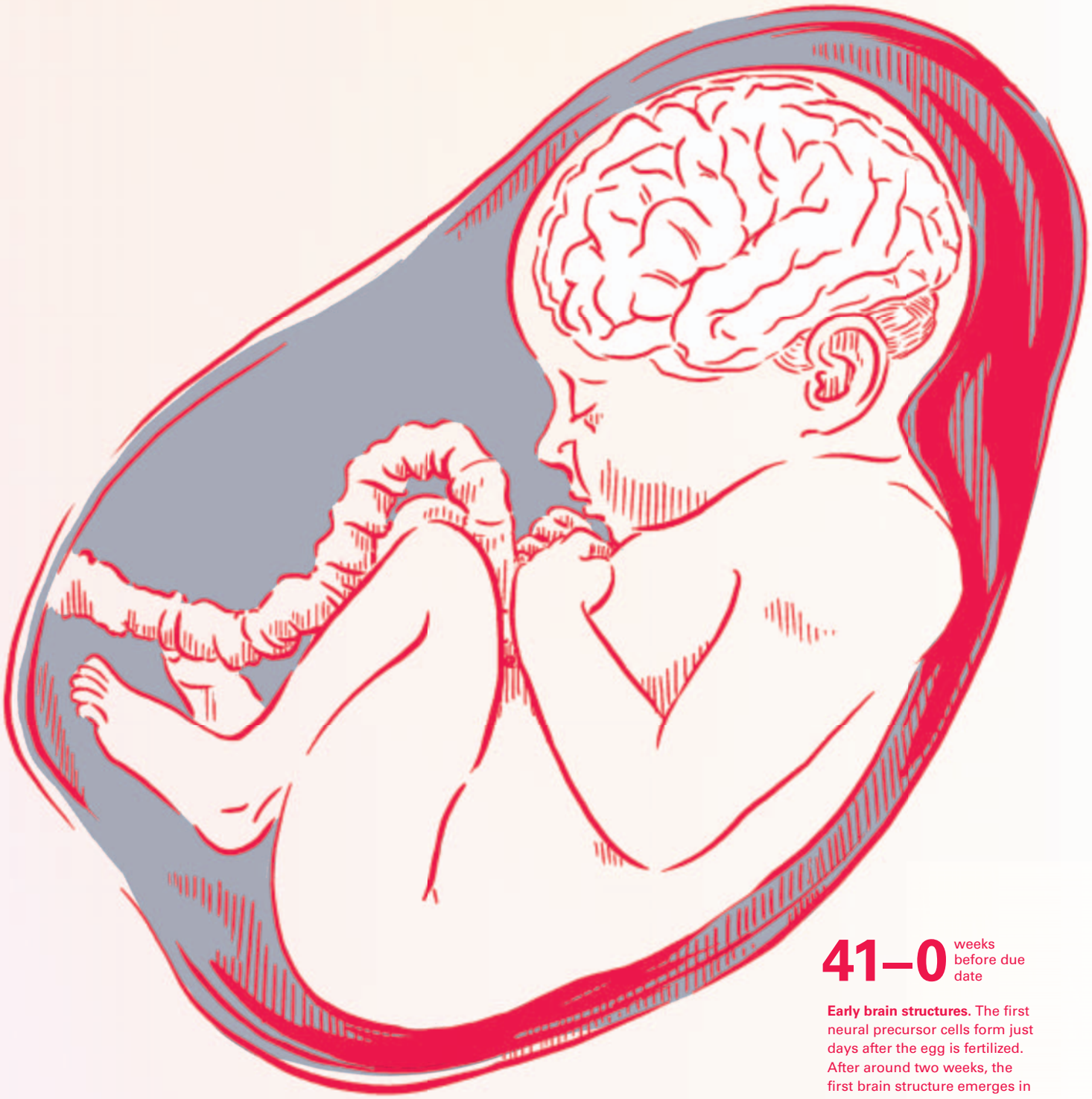
Reshuffle

New subdivisions for the President's Board.

The start of the fall semester will bring a realignment of responsibilities within the President's Board. The current administrative office will be replaced by three new subdivisions of the President's Board: a third vice president's office for "People and Culture", a "Finance" directorate and an "Infrastructure and Operations" directorate. As a result, the President's Board will comprise six members instead of four. By establishing the Vice President's Office for "People and Culture", the university aims to ascribe the necessary importance to diversity issues and the continued development of a strong university community. "This Vice President's Office will be wholeheartedly devoted to addressing the concerns of the people at our university," emphasized University President Andrea Schenker-Wicki. ■

Remembering and forgetting.

Our memory can transport us back to the past just like a time machine: Previously stored experiences and information are brought to the surface; whereas other memories have long since been deleted to make room for new ones. Our memory is imperfect, which makes it all the more remarkable.



41–0 weeks before due date

Early brain structures. The first neural precursor cells form just days after the egg is fertilized. After around two weeks, the first brain structure emerges in the form of the neural tube. After approximately 14 weeks, the hippocampus and the temporal lobes – important brain structures with a key role in memory processes – have already begun to form.

Lost years of infancy.

Our earliest childhood memories are buried deep within us. But a number of clues indicate that we continue to store them throughout our lives. Why, then, are we unable to recall them? Flavio Donato and his team are hot on the trail of early memories in the brain.

Text: Fabienne Hübener

In the beginning, there was E.T. At least that's how Flavio Donato remembers it. Back in 1986, at the tender age of three, he was excitedly awaiting the return of his elder brother, who always brought back a gift for Flavio when he was away on extended trips. This time, his brother pulled a tiny figurine from his bag. It was E.T., the Extra-Terrestrial. Donato is 38 years old now and a neuroscientist at Basel University's Biozentrum, and that is his earliest memory.

Many people's first memories are of a particularly emotional event that took place when they were between the ages of two and five. Anything before that feels as if it has been erased. Researchers refer to the phenomenon as "childhood amnesia". "Our experiences from early childhood can influence us for the rest of our lives," explains Donato. "And yet we don't even remember them. I find that fascinating."

"Our experiences from early childhood can influence us for the rest of our lives. And yet we don't even remember them. I find that fascinating."

Flavio Donato

Donato's research is based on two groundbreaking discoveries. Around 20 years ago, research teams learned that young children who had had half of their brain removed as a treatment for epilepsy were still largely capable of living normal lives. Young brains are so plastic that they can compensate for even serious defects. The second breakthrough was lauded with the 2014 Nobel Prize in Physiology or Medicine. Scientists May-Britt Moser, Edvard Moser and John O'Keefe identified specialized nerve cells in the brain that are responsible for creating a map of the environment. With this insight, the researchers paved the way to understanding how experiences are encoded deep within the brain through the activity of ensembles of nerve cells.

Stellate cells control brain development

Flavio Donato experienced that second discovery up close and in person; starting in 2013, he spent around six years working in the laboratory of May-Britt Moser and Edvard Moser in Trondheim, Norway. It was there that he first observed that during the early stages of brain development, the nerve cells charged with creating a universal map of the environment drive the maturation of those forming memories. This switch allows for different classes of nerve cells to mature according to a regulated process. The

maturation procedure is directed by "stellate cells", star-shaped cells located in an important hub for memory tucked between the cortex and the hippocampus. Donato's study, published in *Science*, earned him the renowned Eppendorf & Science Prize for Neurobiology in 2017.

In 2019, he returned to Basel, where he founded his own working group at the Biozentrum. Aided by a Starting Grant of 1.5 million euros from the European Research Council, he continued his research into early childhood memory through studies on mice. "My plan is to label the nerve cells involved in memory formation during the early stages of development and track them as they mature," explains Donato.

Artificial memory

Scientists have already partially pieced together the process by which memories are made in adult brains: An experience activates a group of nerve cells in the brain and leaves behind a physiological mark, a network of new connections also known as an "engram". Our memory is made up of countless millions of such engrams working in concert. The more frequently we repeat an experience, the stronger the connections between the nerve cells in this network become, and a seldom-trodden footpath is transformed into a bustling street.

To trace the path of a memory through a developing brain until it reaches maturity, researchers must first locate the specific engram in question. For example, they may start by taking mice that are just a few days old and allowing them to begin gathering experiences. The animals might learn that they hear an unpleasant sound whenever they sit in a dark corner. Days or weeks later, researchers observe the behavior of the mouse as it approaches the dark corner. The mouse's demeanor – whether it appears hesitant or assertive – helps the scientists gauge how well the animal remembers the initial experience. Normally, a mouse that is no more than a few days old forgets the unpleasant event after only one or two days.

When scientists artificially stimulate the nerve cells involved in the creation of the memory, however, the mouse hesitates to explore the dark corner. This stimulation reactivates the engram, thus reviving a lost memory. Astonishingly, the nerve cell that has been artificially stimulated does not even have to be a central part of the engram in question. The memory also can be triggered via a back alley, so to speak. Earlier studies involving this type of research have led to the hypothesis that these early memories are not lost after all, even in humans. We are simply unable to access them under normal circumstances.

Flavio Donato has been Professor of Neurobiology at the Biozentrum since 2019 and was awarded a Starting Grant from the European Research Council to fund his research into childhood memory.

Two paths to memory

Based on that hypothesis, Donato and his team have spent the last couple of years studying whether there are differences in the way young and mature brains form memories. It turns out that the process displays both qualitative and quantitative differences depending on age. Young brains, for example, recruit different nerve cells and require less stimulation to establish a memory pathway. "We were surprised to see how little information young mice need in order to learn effectively," reports the neuroscientist. The brains of young animals and adult animals may also process information differently.

But there are still a few missing pieces left in the puzzle when it comes to understanding the way memories form in the young brain. "We're still putting the pieces together, and we've already come to some surprising conclusions," reveals Donato. But he and his team want to be completely certain of their results before taking them public. They are currently conducting comprehensive control trials. If their findings prove to be correct, they will provide a solid foundation for charting the course of early childhood memories all the way to the adult brain. ■

0–6 months

Facial recognition. Babies develop the ability to recognize the faces of close family members early on, thereby demonstrating complex memory. The brain starts to form connections between neurons on the basis of perception. In the first years of life, the brain produces a surplus of these connections (synapses), although many of them are subsequently pruned.

0–2 years

Improving recall. In the first two years of life, the amount of time babies remember things for increases steadily. At six months, they are able to imitate an observed action after 24 hours, although not after 48 hours. At nine months, they can already retain what they learn for four weeks, and at 20 months for over a year.

The woman who never forgets.

There are only about 60 people in the world who can remember everything they have ever experienced. For many of them, this is a source of considerable suffering. Researchers are now scouring their DNA for an answer to the question of why we are able to forget.

Text: Angelika Jacobs

I'm having problems with my memory," it read. James McGaugh had received numerous emails of this sort back in the summer of 2000. In response to the message from 34-year-old Jill Price from Southern California, he wrote that he was a research scientist, not a doctor, and suggested she turn to a medical institute instead. But her reply grabbed his attention immediately: "I run my entire life through my head every day and it drives me crazy!!!"

Two weeks later, the researcher was meeting Price in person on the campus of the University of California in Irvine. McGaugh tested her memory using a book of 20th century historical events and other sources. She could remember each event clearly and tell him where she was when she first heard about it. She knew who she was with, whether or not it was sunny out and what else had happened to her that day. Price merely had to think of a specific date, and the scene would unfurl in her mind's eye.

Memory as a burden

Today, Jill Price is recognized as the first person to be diagnosed with something called hyperthymestic syndrome. She shares this diagnosis, which is also known as Highly Superior Autobiographical Memory (HSAM) with some 60 other people in the entire world. Similarly scarce is any hard data about the condition. Minute differences have been pinpointed in certain brain structures. "However, they don't explain why some people go on to develop HSAM," says Andreas Papassotiropoulos, Professor of Molecular Neuroscience at the University of Basel. Papassotiropoulos has spent long nights discussing the syndrome with his colleague, Dominique de Quervain.

"A couple of years ago, we initiated a search within the German-speaking countries and received thousands of replies," explains the researcher. But they were not able to isolate a single case of HSAM. The vanishingly small number of people diagnosed with the syndrome further complicates this puzzle. However, one approach seems promising: People like Jill Price learn new information just as efficiently as those without the condition. The difference is that the brains of people affected by HSAM do not delete experiences or impressions. That means that while they are able to lead relatively normal lives, they are dogged by the persistent presence of their memories – and forced to relive every sad or unpleasant moment they've ever experienced. Jill Price views her memory as a burden, and many others diagnosed with HSAM suffer from psychiatric problems.

Andreas Papassotiropoulos has been Professor of Molecular Neuroscience at the University of Basel since 2007. He heads up the Transfaculty Research Platform Molecular and Cognitive Neurosciences together with his colleague Dominique de Quervain.

"In order to function properly, your memory needs to be able to disregard trivial information," explains Papassotiropoulos. This is an active process of tidying up the memory archives, not the gradual degradation of unused archival materials. In 2014, the research team headed up by Papassotiropoulos, de Quervain and Attila Stetak was able to prove this fact by identifying a gene in roundworms that is key to the process of forgetting. The "musashi gene," as it is called, is present in humans, too.

A stack of magazines sits atop the sofa table in Papassotiropoulos' office; the memory researcher has amassed a small collection of the scientific journal *Cell*, which published the team's highly regarded study. Beside it lie an orderly collection of other journals bearing his publications. The professor has a fondness for order, not just when it comes to memory, but in his office, too, and the space reflects that fact: His large, clearly organized desk is set against a shelf lined with punctiliously labeled files and crowned by the framed certificate proclaiming him the winner of the 2013 Cloëtta Prize. "We started by looking at the musashi gene in people affected by HSAM, but in this respect they're no different from other people," admits the neuroscientist. His voice almost seems to catch in a pang of regret.

Irvine-based researcher James McGaugh – "Jim" to his friends – offered to collect DNA samples from 21 people with HSAM and some of their blood relatives back in the early 2000s. "We went ahead with it even though we didn't know what to do with that information at the time," he recalls. That all changed just a few years later with the advent of the gene sequencing revolution. It had finally become both technically and financially feasible to analyze in detail the wealth of hereditary data.

A risky venture

At the Transfaculty Research Platform in Basel, researchers have been looking for gems in this data source. They can detect the tiniest deviations in the genes of those with HSAM, unique sequences that do not occur in the same place in 100,000 other people. "We are concentrating solely on the sections of DNA that actually code for proteins, and we sequence them down to the smallest detail. If there's something that can be traced back to a single gene, we'll find it," underlines Papassotiropoulos.

But it is a risky bet. HSAM could just as easily result from interactions between multiple genetic anomalies that produce the syndrome only when one specific combination occurs. It might also be caused by a mutation in a gene that does not code for a protein at all, but instead carries out a regulatory function in cellular processes. Papassotiropoulos admits that their probability of success is slim compared with other projects. Their study was made possible thanks to financing from the FreeNovation Award granted by the Novartis Research Foundation; the award is designed to fund speculative ideas just like this one.

Initial promise

Risk aside, if Papassotiropoulos' team were to pinpoint a genetic cause for hyperthymestic syndrome, it would be a revolutionary discovery. A finding like that could completely transform our understanding about how we forget. Not only would it shed light on the cause of the extraordinary abilities of people like Jill Price, it would also boost research into more common phenomena in which the brain forgets too much or too little. This includes conditions such as Alzheimer's or post-traumatic stress disorder, in which sufferers experience persistent memories of traumatic events.

Papassotiropoulos concedes that he is trying to rein in his expectations. The data often seems to suggest an imminent breakthrough, but that initial promise is frequently thwarted upon closer scrutiny: "I always think I've finally got the answer, but then it slips through my fingers again." Should his team strike upon a discovery capable of bearing up to the most rigorous testing, it would be a dream come true for Papassotiropoulos. If and when that day finally comes, he would like to travel to the United States to meet Jill Price and others with HSAM – and finally give them the answers they are hoping for. ■

"I run my entire life through my head every day and it drives me crazy!!!"

Jill Price

≈1 year

Triathletes in the making. Learning to walk involves a type of memory known as procedural memory, which stores the movement patterns required to walk – and later to cycle or swim. This kind of memory does not need to be consciously retrieved. Accordingly, procedural memory is a subset of implicit memory, which operates at the unconscious level.

2–3 years

Earliest memories. In this stage, explicit memory – the conscious recall of events – improves. Many people's earliest childhood memories date back to this period or a little later, and are mostly of a special event such as a birthday party. Language acquisition is also closely linked to the unfolding of memory, allowing a child to repeat information either to itself or out loud, aiding retention.

Seeking support for the working memory.

We only tend to notice how heavily we rely on our working memory when it is no longer functioning properly, like when we age or if we are affected by mental illness. Researchers are currently looking for ways to improve short-term memory in everyday life.

Text: Santina Russo

While you are busy reading this sentence, your working memory is making sure you do not forget the beginning by the time you reach the end. It is also responsible for helping you temporarily retain addresses or pin codes and remember where you put your shopping list just moments ago. Thanks to your working memory, you are able to follow along in complex discussions and address the arguments of your fellow interlocutor even several minutes later. In short, your working memory serves as the brain's temporary storage, or RAM, and makes it possible for you to seamlessly navigate countless commonplace activities – without ever noticing it is there.

But this temporary storage can start posing problems for us early on in life. Our memory performance starts dropping after the age of 25 and by the time we reach 50, these changes become apparent. In addition, some mental illnesses such as schizophrenia or depression often negatively impact working memory. "This can severely impede the daily lives of those affected," says Dominique de Quervain, neuroscientist at the University of Basel. He and his research group are searching for different ways to kick-start the working memory, for example through specific exercises or drugs.

Training working memory the right way

The researchers aim to do more than just train the working memory, they want to improve other cognitive functions, too. On its own, boosting the working memory is not terribly useful unless these improvements can be applied on a practical level. Higher performance can be measured using specially designed tests, but it does not always translate into increased aptitude in everyday skills. "If you practice memorizing strings of letters, you'll get better at it, but that won't help you log in to your online accounts or understand what you're reading," explains de Quervain.

Dominique de Quervain
is Professor of Cognitive Neuroscience and Co-Director of the Transfaculty Research Platform Molecular and Cognitive Neurosciences at the University of Basel.

Priska Zuber
is a doctoral candidate and serves on the Faculty of Psychology and the Transfaculty Research Platform MCN at the University of Basel.

Recently, a doctoral researcher in his team, Priska Zuber, developed a training app that is the first tool of its kind to attempt to apply training for working memory to real-world activities. In her new app, users complete different types of tasks that train specific components of their working memory, including the part responsible for colors, shapes and spatial orientation and another part, which manages what we hear or read. The tasks are playful but challenging, and they all take place in outer space. Users can train their memory, for example, by watching satellites light up in a certain order and then entering the correct order in the app. To add an additional level of difficulty, there are built-in distractions between the memory portion and the recall portion. These may take the form of unrelated sounds or images.

Distraction is a good training tool

In a clinical study of around 90 participants, Zuber tested the results of this training strategy and compared it with a conventional, established training method. Over the course of three weeks, the participants – all over the age of 55 – practiced four times a week using one of the two training methods. A con-

trol group used a tablet to perform tasks that tested their fine motor control without training their working memory. Prior to and following the main task, participants were given cognitive tests to evaluate their working memory and also to establish whether the training had been effective in improving other cognitive functions.

Only the method that included built-in distractions was shown to significantly improve participants' memory performance. "Clearly, the distractions help teach the working memory to differentiate between relevant and irrelevant information. And that improved memory," Zuber elucidates. That same type of training sometimes boosted other cognitive functions as well. The participants in this group also performed better when it came to visual-spatial learning. Zuber is planning to conduct a follow-up study exploring how these distractions help to train the working memory.

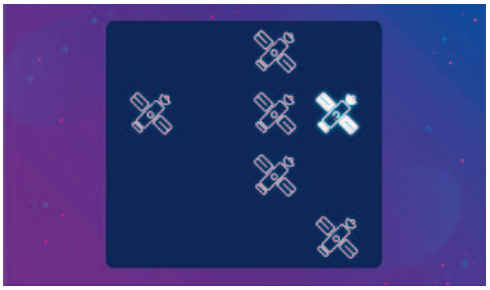
Helping people with mental illness

In the future, people affected by mental illness may also be able to receive medications to improve their working memory. To this end, de Quervain is currently investigating a pharmaceutical known as fampridine (4-aminopyridine), which is used to treat multiple sclerosis. He and his team uncovered its potential to influence working memory as part of a genomic comparison study. The researchers compared the results of a study which scoured the DNA of 100,000 people for genetic risk factors for schizophrenia with the team's own genetic data on working memory. Along the way, they identified a gene involved in both schizophrenia and working memory.

The gene in question codes for a potassium channel. These molecules play a key role in the brain, where they help to transfer signals between nerve cells and thereby influence how information is stored as part of the working memory. Fampridine targets exactly these potassium channels: In the case of multiple sclerosis, it helps control the way movement signals are transferred through the nerves, making it easier for patients to walk. To test whether fampridine also improves the agility of working memory, de Quervain is planning a clinical study with healthy participants aged 18 to 30.

Not another brain-doping drug

Should fampridine truly prove to augment the power of the working memory, could it also be used by healthy people to bolster their concentration while working or studying? Could fampridine even be destined to become a wonder drug with the power to turn us all into intellectual superhumans like Bradley Cooper in the Hollywood blockbuster "Limitless"? "No, that's highly unlikely," says de Quervain with a smile. "A pill with those kinds of extreme effects is pure science fiction." Reality looks a little different. "We are happy to observe even a moderate improvement in the daily lives of the people we treat," he acknowledges. Whether those improvements come from drugs or training, the techniques are simply not suitable for doping. Yet, one day, they may give sick and older people the chance to change their lives for the better. ■



Identify the order in which the satellites light up white. Participants who enter the right answer are presented with a longer sequence in the next round. The task trains the spatial subcomponents of the working memory.

In this task, participants hear sequences of letters and are asked to type them in without being distracted by repeated noises.

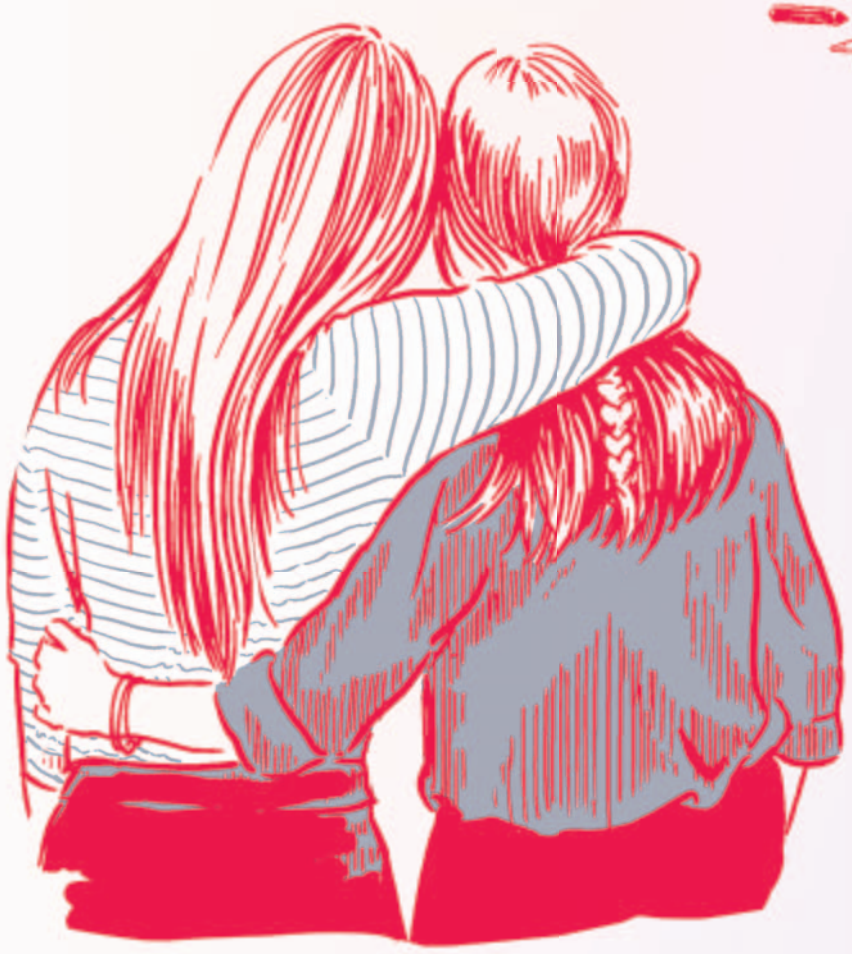
Here, the task is to recognize a specific symbol from a line-up while entering whether the note being played is low or high pitched. This task trains the so-called central executive of the working memory, which is responsible for coordinating different inputs at the same time.

≈4 years

Planning ahead. This is the stage in which children develop prospective memory – the ability to remember to perform a given action at the right time. This kind of memory does not refer to events in the past, but to future intentions, and is the basis for all considered action.

6 years
From school age

Acquiring facts. Semantic memory – the ability to retain facts – improves noticeably in this phase, as does long-term memory. This is also the life stage in which children learn to deliberately suppress memories.



12–18 years

Unforgettable teenage years. Memories of experiences, songs, places and people from this phase of growing up are very likely to endure for 20 years – or an entire lifetime. 30-year-olds have the most vivid memories of their teenage years. In research, this is known as the "reminiscence bump".

When the virus returns.

Immunological memory is based on complex interactions between different types of cells, and the process involves thousands of genes. Two perspectives on a fascinating phenomenon with which scientists are still struggling to come to grips.

Text: Ori Schipper

It's never happened so fast before. Thanks to the tireless work of countless research groups, it was possible to develop an effective vaccine against the SARS-CoV-2 coronavirus within the span of just a single year. Widespread vaccine campaigns have already begun to roll out, but the pressing question now is: How long will the vaccine protect us? Will it be effective against the mutant variants of the coronavirus now emerging in multiple countries around the world?

"The aim of every vaccine is to produce an immunological memory that lasts as long as possible," says Carolyn King, Research Group Leader at Basel University's Department of Biomedicine. The idea is to expose an individual to a pathogen that has been weakened or split up into benign subunits with the goal of eliciting a response from the immune system. How effective the immune system is at fighting off this particular pathogen or a related mutant strain depends on the interaction between the different immune cells that are activated by the defensive response – and that remain active after the infection subsides.

Today, there are a wide range of established vaccines. But many questions regarding the exact role of different cell types in building immunological memory remain unanswered. This is a point of serious contention for experts in the field. The fact of the matter is that these details are not only important to researchers; they are critical to the development and production of vaccines, too.

What we do know is that the typical immune response is divided into two phases: The "innate immune response" is rapid, attacking many foreign pathogens just minutes after they enter the organism. However, this type of response is non-specific and fails to form any long-term immunological memory. Memory is formed in the second phase, during the "adaptive immune response," in which the immune system launches a targeted assault against a specific pathogen.

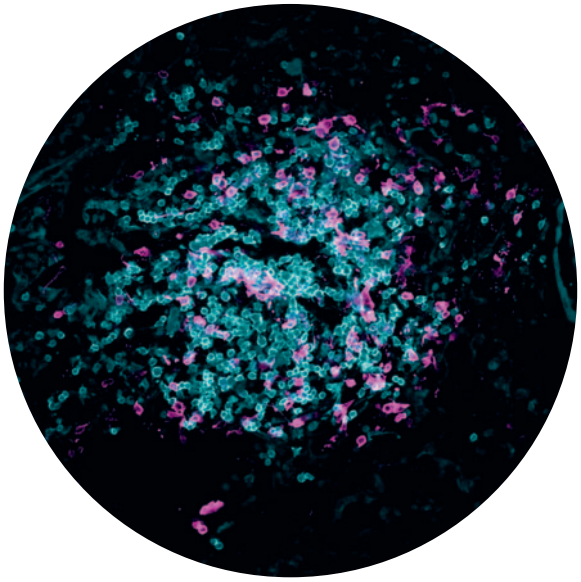
Quicker and more efficient response

Central to this adaptive immune response are the interactions between the different types of immune cells, which can be roughly split into three categories: B cells, helper T cells and killer T cells. B cells are primarily associated with the production of antibodies, which bind to specific pathogens, thereby placing a kind of chemical target on the invader. Helper T cells release signal molecules to help support other immune cells, and killer T cells are deployed to destroy infected cells.

Humans are born with T cells featuring a multitude of different receptors, or uniquely shaped sensors located on the outer surface of the cell. So, when an infection occurs – or a vaccine is injected – the immune system activates only those specific T cells

Carolyn King is a professor at the Department of Biomedicine and researches the biology of immune cells.

Mike Recher leads a research group at the Department of Biomedicine and is senior physician in clinical immunology at University Hospital Basel.



T cells (magenta) and antibody-producing B cells (cyan) in the lung tissue of a mouse.

with receptors capable of binding to the corresponding parts of the pathogen. These T cells then multiply in order to mount a battle against the foreign body. After their work is finished, most activated defensive cells die off, while a small number remain alive in the host. These "memory cells" ensure that the organism's immune system is able to respond quicker and more efficiently the next time that same pathogen is detected in the body. "Research on T cell memory has long been focused on killer T cells," says King.

The lung's memory

King and her team are primarily interested in helper T cells. Their main function is support the production of antibodies by B cells. It has long been known that T cell help to B cells takes place in either the spleen or the lymph nodes. However, after conducting a number studies on mice and influenza viruses, King's team was recently able to conclude that T cell help to B cells also occurs in lung tissue.

Surprisingly, helper T cells remain in the mucous membranes of the lungs long after the infection has been eliminated. There they interact with B cells, allowing the body to prosecute a local defensive response should reinfection occur. King's experiments also demonstrated the importance of lung resident helper T cells in orchestrating an effective immune response against closely related variants of influenza viruses.

Clearly, the body not only maintains a fleet of memory cells that circulate in the blood; it also stations a squad on the frontline – in the tissue where the same or a similar pathogen may reinfect the body – to serve as a memory of the initial infection. "The longevity of these helper T cells in the lungs and their ability to respond quickly to infections by mutated pathogens make them a promyising candidate in the search for vaccines that offer lasting protection," remarks King.

Like clockwork

The immune system's aptitude for remembering previously-encountered pathogens is also the subject of study by one of King's colleagues, Mike Recher, who heads up another research group at the Department of Biomedicine and supervises the Clinic for Immunodeficiency at University Hospital Basel. His clinic serves patients suffering from frequent recurrent infections.

Many thousands of genes are involved in the structure and function of our immune system. So, according to Recher: "It's no wonder that immune deficiencies often stem from genetic changes." Recher illustrates the effect of a mutation by drawing an analogy: "All these genes are like sprockets in the complex gear system that make up a mechanical clock. If just one of those sprockets refuses to bite, the whole clock stops ticking."

Even though defects can impact different genes (or sprockets), the effect is the same for over half of Recher's patients: Their immune systems are unable to produce a sufficient number of antibodies. This 'immunoglobulin deficiency' often causes recurrent respiratory infections. However, according to Recher, infections can be prevented using immunoglobulin replacement therapy, a treatment method with a long history and track record of success.

It only takes a few drops of blood to determine whether a patient is low on antibodies. The test is simple and affordable, adds Recher. "But it takes an average of ten years before doctors are able to isolate the cause of a patient's health problems." By then, untreated immune deficiencies can result in irreversible organ damage. That is why Recher considers it crucial to focus not only on immunological memory, but on the memories of medical practitioners, too. Doctors must consider the possibility of immunodeficiency early on, so that patients with suspected cases can be tested sooner rather than later. ■

>12 years

Virtual memory. The increasing amount of time teenagers and adults spend online is not without consequences for their memory. People get worse at retaining information if they think it is just a click away – a phenomenon experts call the Google effect, or digital amnesia.

≈14–20 years

First kiss. No one ever forgets their first kiss. This is guaranteed by two directly adjacent brain structures that play a key role in episodic memory and emotions respectively: the hippocampus and the amygdala. The interplay between these two parts of the brain ensures that particularly pleasant experiences – as well as particularly unpleasant ones – remain etched into our memory.

Risky surgeries.

Surgical interventions alleviate suffering and can save lives. For older patients in particular, however, operations are sometimes followed by memory problems. A research group at the University of Basel is studying this phenomenon in the hope of finding ways to keep the symptoms at bay.

Text: Sabine Goldhahn

No surgical procedure is entirely risk-free. When a patient appears confused in the wake of an operation, or reports significant memory loss perhaps even weeks later, researchers and clinicians call this a perioperative neurocognitive disorder. But is it a reason to forgo surgery? The following answers to key questions help shed light on the dilemma.

Are memory problems following surgery a cause for concern? Yes. If memory problems occur in the wake of surgery, this is considered a complication: in this case, an impairment of brain function. The phenomenon is also known as "postoperative cognitive dysfunction", or POCD. It is distinct from postoperative delirium, another brain disorder that can also occur after surgical procedures. Severe cases of postoperative delirium can result in lasting disorientation, loss of independence, or even increased mortality.

What form do these memory problems take and when do they occur? The symptoms of POCD resemble a mild form of Alzheimer's disease, and generally occur within a few weeks to months after surgery. Affected patients are forgetful and struggle to learn new things. Relatives occasionally report that they are no longer themselves. Symptoms can be very subtle, and often go unnoticed by those affected.

How is a case of POCD identified? There is a high number of undiagnosed cases. Even for medical experts, it can be difficult to recognize POCD and distinguish it from age-related memory loss. Special memory tests, some of which are used in Alzheimer's, are required for diagnosis. For the diagnosis to be accurate, the first test must be carried out before the operation. This provides a benchmark that specialists can subsequently use to determine whether the patient's memory has deteriorated.

Are POCD assessments performed routinely? No, in routine practice, this is often not possible yet. At the moment, POCD-related diagnostics are almost exclusively limited to research projects, for instance at University Hospital Basel. Here and at the Memory

> **"The decision to operate is always a trade-off between the potential gain and the possibility of complications."**
>
> Nicolai Göttel

Clinic at the Felix Platter Hospital, researchers from the University of Basel developed the CogCheck tablet app, specifically to allow faster testing of their patients. The app includes key neurocognitive tests that patients can complete without external assistance, for example before undergoing a surgical procedure. The results are compared against data from a large number of healthy subjects of the same age and gender, and a similar level of education. If an individual's test results show a significant deviation from the norm, this suggests an existing cognitive impairment.

How frequent is POCD and who is most likely to be affected? There are few exact figures. What we do know is that POCD is particularly common among older people – above the age of 60, the likelihood is around 40 percent – or patients already suffering from dementia or impaired memory function before the intervention. It is much rarer for younger people to develop POCD.

Are there any particular risk factors? Aside from age or pre-existing memory problems, the primary factors are the extent and type of the operation. For instance, delirium and POCD are particularly common following open-heart surgery. However, it has also been observed in the wake of hip operations or other major surgery. As far as we know, neither the anesthetic drugs used nor the type of anesthesia affect the likelihood of POCD.

What are the possible causes? Any operation puts strain on the body, eliciting a stress reaction by the immune system. This triggers inflammatory processes that can directly influence neurons. That said, the exact mechanism behind perioperative neurocognitive disorders is not yet known. In all likelihood, there are a number of factors that contribute to the occurrence of POCD.

How is POCD treated? POCD symptoms generally disappear after around a year. Until that happens, there is no specific treatment, such as medication. Nonetheless, patients are encouraged to stay physically and mentally active. This could involve anything from social contact, sports, and games to train the memory.

How great is the risk of not regaining full cognitive function? There are no exact figures on this, but it is relatively rare. If symptoms persist for longer than a year, it is likely that the patient was already suffering from some form of memory problem, but it was slight enough to go unnoticed until the operation. An increasing number of anesthesiologists and surgeons are careful to tell their high-risk patients that surgery may unmask mild forms of dementia.

Are there precautions that can be taken against POCD? Given the different risk factors at play, there is currently no sure-fire way to prevent POCD. There is no proven prophylactic drug at present. That said, everyone can take steps to minimize the potential negative effects of surgery. This could involve dedicated exercises to boost physical fitness and memory for several months leading up to the procedure. The positive effects of this kind of "prehab" are known from cancer treatment. A targeted prevention strategy for perioperative neurocognitive disorders has considerable prospects of success. ■

Nicolai Göttel
has been an anesthesiologist at University Hospital Basel since 2013, and a research group leader at the Department of Clinical Research at the University of Basel since 2019. In early 2021, he moved to the University of Florida, but retains ties with Basel as a private lecturer and researcher.

Clinical Study

Anesthesiologists Nicolai Göttel and Luzius Steiner from are currently conducting a clinical study at the University of Basel in the hope of identifying a structural biomarker for postoperative cognitive dysfunction. The underlying idea: Alzheimer's disease causes the hippocampus – the region of the brain where memories are formed – to shrink. The researchers' assumption is that POCD is also accompanied by shrinkage of the hippocampus. They hope to use magnetic resonance imaging (MRI) to document this reduction in brain volume and compare it against the results of memory tests conducted on both surgical patients and healthy test subjects. The aim of the study is to expand knowledge regarding POCD with a view to developing both treatment strategies and prophylactic measures.

18–45 years

Momnesia? Sleep deprivation! Expectant and new mothers often feel that their memory has abandoned them. This phenomenon, informally known as pregnancy brain or momnesia, is commonly chalked up to hormones, but objective tests offer no evidence of this. A much likelier explanation for the memory and concentration loss experienced by these women is relentless sleep deprivation. Hormones such as cortisol and estrogen have been shown to have an effect on the transmission of stimuli in the brain, however.

≈50 years

What just happened? Both episodic memory and working memory, which we rely on to remember a phone number for up to a minute, for instance, begin to gradually deteriorate from as early as age 25. At around the 50-year-mark, this decline becomes much more noticeable. The upshot is that this is accompanied by gains in crystallized intelligence – the ability to learn from experience and make analogies.

No statute of limitations on serious crimes.

Interview: Christoph Dieffenbacher

Time is a key factor when investigating and sentencing serious crimes. An interview with criminal law expert Professor Christopher Geth about statutes of limitations and on forgetting in the justice system.

UNI NOVA: Professor Geth, when someone rides their bike in the park, they're liable to be fined, but that fine quickly lapses and is promptly forgotten. The statute of limitations on a murder, by contrast, is 30 years. Does the law have different ways of telling time?

CHRISTOPHER GETH: It's true that time is a key factor in criminal trials. The statutes of limitation on criminal prosecution depend largely on the severity of the crime. That means the limitation period is linked to the crime and can range from three years for misdemeanors to no time limits at all for the most serious crimes, such as genocide or sexual offenses committed against children under 12. The latter was introduced following a referendum in 2008, because, among other things, children who have been victimized by these types of crimes require special protection. Time is of the essence for the state, because a crime can only be prosecuted during the defined statutory limitation period.

UNI NOVA: What are the benefits of limitation periods?

GETH: They are a way of expressing the fact that punishment as a way of compensating for culpability and unlawful behavior loses its meaning with the passage of time. A punishment imposed too late can seem unreasonable. The assumption is that the disturbance to the peace caused by the crime in question dissipates as time goes on. If someone insulted you three years ago, you probably don't care about it anymore today. The second reason is that it prevents miscarriages of justice. As time passes, details can be forgotten and less evidence is available. That applies to both incriminating evidence brought by the state as well as exculpatory evidence presented by the defendant.

Christopher Geth joined the Faculty of Law as Professor for Criminal Law in 2021. His primary field of study is Swiss criminal law and criminal procedural law, in particular the General Provisions of the Swiss Criminal Code as well as law of evidence and medical law.

UNI NOVA: But forgetting is not forgiving...

GETH: That's right, they're not the same. Forgetting is a psychological process, while forgiving – in the sense of forgiveness – is normative. Criminal justice employs both these categories, but when it comes to statutes of limitation defined on the grounds of legal certainty, we're no longer dealing with forgetting or forgiving as such, but with strict deadlines. Forgetting and forgiving may provide the ideological foundation for the legal norms governing statutes of limitations, but they aren't needed to close the proceedings on a specific case when the limitation period has elapsed. Of course, that means those affected by a crime may suffer when the limitation period is over, and enough time has passed for the general public to view it as a closed case.

UNI NOVA: Unsolved felonies can cause a lot of turmoil. In Switzerland, politicians are campaigning to lift the statute of limitations for murder altogether. What do you think of that?

GETH: There are always dramatic murder cases that capture the public imagination even decades on. Take, for example, the unsolved murder of the two young women in the St. Galler Rheintal back in 1982, the case known as the "crystal cave murders". The limitation period for that case has elapsed, so it wouldn't be possible to convict, even if new evidence were to come to light or the murderer or murderers themselves were to confess. But I'm not convinced that's for the best. It's not plausible to say that the public need for punishment diminishes significantly over time in the case of serious capital crimes such as murder. The only reasonable argument for the statute of limitations would be the increased difficulty of providing evidence, but modern forensics methods have helped to mitigate that issue. Although there are limits to DNA evidence, I find the argument for abolishing the statute of limitations for murder to be very persuasive. The most important thing is to ensure that the courts can guarantee a fair trial for everyone involved, even 30 years later.

UNI NOVA: How does society help to shape the law?

GETH: Criminal law is an emotional topic for many people, and in the long term, it molds itself to fit the dominant societal mores. Still, accusations and contempt for others can crop up in society in ways that are totally unrelated to the legal system. These are based purely on moral judgments, that have no place in the law. ■

Can memory be shared?

We often hear about a society's "collective memory". It is a concept that doesn't sit well with Basel historian Erik Petry, who enjoys confronting conventional wisdom on the subject – and invokes Jewish history to make his point.

Text: Samuel Schlaefli

"Wir schaffen das" (we can do this) – these three words will go down in the history books as Angela Merkel's legacy. On 31 August 2015, in the midst of the refugee crisis, the federal chancellor called on her nation to show solidarity with those who had lost everything. Days later, the borders were opened. Thousands of refugees, mostly from Syria, Iraq and Afghanistan, promptly set out for Germany, drawn by Merkel's three words and the hope of a dignified life in safety that they implied.

Later, Merkel's courageous words would often be attributed to the "collective memory" of the German people, the implication being that the experience of World War II and the Shoah had been engraved on this collective memory as a kind of historical responsibility. This is a claim that historian Erik Petry has little time for, however: "If Merkel's decision had arisen from a 'collective memory', then the entire population would still be united in their support for it today," the Deputy Head of Basel University's Center for Jewish Studies remarks. Recent developments show that this is not the case, however: The ascendancy of the right-wing party AfD, the vilification of migrants in the media and among the general public, the racist riots in Chemnitz in 2018 and the antisemitic murders in Halle in 2019 – all of this flies in the face of Merkel's "We can do this", Petry argues.

"Am I, as a person, already a part of the collective memory of Switzerland – or at least of Basel?"

Erik Petry

Collective memory – what does it even mean?

In his postdoctoral habilitation thesis and various essays, Petry takes issue with the ideas of "collective" and "cultural" memory, which he considers too nebulous to be useful. He illustrates the point with an example from his own life story: He is originally from Germany, and has lived in Basel for 23 years. "Am I, as a person, already a part of the collective memory of Switzerland – or at least of Basel? And is the 'Bebbi-Sagg', the Basel garbage bag, that I regularly leave on my doorstep, also a part of this memory?," he asks provocatively, and roars with laughter. It is quickly apparent that this is someone who en-

joys a bit of rhetorical rivalry, and likes to question notions that many others take for granted.

Petry's ideas pit him against some prominent voices in social and cultural studies. The idea of a "collective memory" was first popularized by the sociologist and philosopher Maurice Halbwachs. In his first publication on the topic – "Les cadres sociaux de la mémoire" – in 1925, Halbwachs wrote that all memory is influenced by environmental factors, and therefore exists within a social framework. He posited that each recollection becomes a collective phenomenon, and the collective memory is a repertoire of narratives about the past that is shared by different social groups. Along with the lesser-known cultural theorist Aby Warburg, Halbwachs sparked an interest in remembrance culture that endures to this day.

In the 1990s, the cultural theorist and Egyptologist Jan Assmann revived the idea pioneered by Halbwachs and developed it further under the label "cultural memory" with the literary scholar Aleida Assmann. They argued that while nations, states, the church or companies have no memory of their own, they forge one from signs, symbols, texts, images, rites and monuments. For Jan Assmann, the collective memory is a social network that gives its members a sense of identity, promoting connections within the group and contributing to a sense of "us". His wife Aleida Assmann later added the concept of a "national memory": According to her theory, shared history gives rise to a national identity, which can be deliberately leveraged by politicians. This is done by highlighting historical points of reference that reinforce the positive self-image and are consistent with particular goals, while events with negative connotations are deliberately suppressed.

Jewish history as a counter-argument

Petry likes to compare Jan Assmann's notion of "cultural memory" with Christianity's Holy Spirit – an intangible presence, floating above everything, that no one really knows anything about. "It has no explanatory power whatsoever, so the concept is useless to me as a historian," he complains. For Petry, the assumption of a shared consciousness is just too simplistic. In one of his essays, he explains his efforts to "step into the shoes of the individual, to see things from their perspective". In a nod to the retired Basel historian Heiko Haumann, Petry calls this the "life-world view", which he pursues in his own research and seeks to convey to his students – for instance by means of oral history projects documenting the actions and recollections of Shoah survivors and their descendants.

Petry's intellectual crusade against the concept of collective memory is all the more surprising considering that the emergence of Zionism and the foundation of the State of Israel are often ascribed to precisely such an idea. Nevertheless, the historian believes that Jewish history corroborates his stance. "During the founding period, Holocaust survivors from Poland came face to face with Jewish scholars from Baghdad, for instance," he explains. "Both were without a doubt Jewish – this was what united them. But the two groups had little in common, and I'm quite sure they didn't feel connected by a collective memory in the sense proposed by Assmann."

Oral traditions

There is no question that the experience of oppression is shared by the entire Jewish community, and has given rise to a collective need for security, Petry says: "But this unity was imposed on the Jews from the outside, and has nothing to do with a shared identity." For the most part, diversity within the Jewish community is severely underestimated, he argues. "I have a good friend in Israel who comes from a long line of Rabbis," he recounts. "She is fond of saying she is 120 percent Jewish, even though she doesn't give two hoots about religion."

So does the historian reject the notion of shared memory entirely? "No, I believe it exists in the form of oral traditions, understood as an individual learning process," Petry explains, adding that the concept of tradition is much more precise – and fruitful in terms of historical research – than that of collective memory. "When Angela Merkel proclaimed that 'we can do this', she wasn't simply following a common narrative," Petry believes. "Rather, she was drawing conclusions from her own personal history, and acting on them." The fact that her actions did not meet with "collective" approval shows, among other things, that racism and antisemitism are once again on the rise in large parts of Europe. ■

Erik Petry
is Professor of Modern General and Jewish History as well as deputy head of the Center for Jewish Studies at the University of Basel.

Catching memory loss before it's too late.

Text: Yvonne Vahlensieck

The earlier dementia is diagnosed, the more can be done about it. A research team in Basel is working to identify the very first signs of Alzheimer's disease.

Everyone forgets things now and then – even Andreas Monsch, Head of the Memory Clinic at the University Department of Geriatric Medicine at the Felix Platter Hospital. "Up to a certain point, such lapses are normal. That's why we all use aids like this one," he says, holding up the smartphone he entrusts with his schedule.

Sometimes, however, increasing forgetfulness can be a warning sign for the onset of dementia caused by Alzheimer's disease. The Memory Clinic FELIX PLATTER specializes in early diagnosis of cognitive impairments: Each year, the clinic assesses around 1,000 people using specially developed cognitive tests, comprehensive medical examinations, and magnetic resonance imaging (MRI) brain scans that reveal changes in the brain's structure and allow other causes such as tumors to be ruled out.

The team's goal is to be able to diagnose dementia at the earliest possible stage so that help can be offered as soon as possible. Although there is still no treatment with the capacity to heal or halt Alzheimer's disease, there are drugs which help to slow disease progression. Furthermore, clarity is of great value to the families of those affected: "For 90 percent of relatives, the diagnosis comes as a relief. It means they know what they are up against and it allows them to deal with the situation more effectively," Monsch explains.

Diagnosis before symptoms arise

This is why researchers at the Memory Clinic are working to improve early diagnostics even further. They hope to develop tests to detect dementia before major symptoms occur in everyday life. "The brain is very good at compensating. Impairments can go unnoticed for a long time, even if the disease has already been ongoing for months or years," says Sabine Krumm, a psychologist who specializes in neurocognitive processes.

Her research takes an innovative approach: Thanks to MRI scans, we know that the first harmful accumulations of Tau proteins typical of Alzheimer's occur in an area of the cerebral cortex roughly the size of a fingernail, known as the perirhinal cortex. Among other tasks, this region of the brain is responsible for recognizing complex images and objects. "Accordingly, we are working with new cognitive tests to assess these particular functions. After all, memory loss may not necessarily be the very first sign to occur."

The perirhinal cortex is involved in telling apart living creatures – a more complex task than distinguishing between objects such as tools, for example, as living creatures often share numerous features. Krumm administered tests to subjects at an early stage of Alzheimer's disease, a task in which they had one minute to list as many animals and fruits, and then as many tools and vehicles, as they could. For animals and fruits, they performed significantly worse than a healthy control group, while for tools and vehicles no difference was observed.

Krumm believes that tests of this sort have the potential to enable much earlier detection of Alzheimer's dementia. To test this hypothesis, she is leading a study in which 400 cognitively healthy individuals with an average age of 75 perform a series of cognitive tests over a number of years, and undergo an MRI scan each time. It is predicted that 25 to 30 of the subjects will develop dementia over the next few years. Krumm can then retrospectively analyze the test results to look for the very first measurable differences between the subjects that remained healthy and those who became ill.

Monsch believes that this project will lay important groundwork: "If a drug to treat Alzheimer's is discovered, we would want to use it before symptoms occur." After all, brain cells that have been destroyed cannot grow back. If we want to conquer this terrible disease, we need to be able to diagnose it before patients realize they are affected." ■

Researchers use cognitive tests in an effort to identify the early signs of dementia.

≈60 years

Slowing down. Neurons begin to decay at an ever-faster rate, although physical and mental activity, for instance in the form of social contact, can help keep memory intact for longer. Learning new skills – such as a musical instrument or a new language – remains possible even at an advanced age. However, the learning process takes longer as it becomes more difficult for information to be transferred from the short-term to the long-term memory. With increasing age, youthful memories remain vivid while those from the previous week quickly fade.

Death and oblivion. In death, our last remaining neurons begin to die, extinguishing the physical embodiment of our recollections. All that remains is for us to become a part of the collective memory of those close to us.


Intuitive Control of Macro-Robots for Surgery
Goals
Background
Challenge
1
2
3
4

Robots for precision surgery.

In the "Bio-Inspired RObots for MEDicine Laboratory", researchers are creating a novel robotic endoscope designed to perform minimally invasive laser surgery in bone as part of the MIRACLE project. By decoupling from the endoscope, the tip is able to firmly attach itself to the bone for stabilization and increased cutting accuracy.

Georg Rauter is Professor of Medical Robotics and Mechatronics at the University of Basel's Department of Biomedical Engineering.

Manuela Eugster was completing the final stages of her doctoral dissertation in the BIROMED Lab at the time of going to press.

Photo: Florian Moritz

1 Professor Georg Rauter of the Department of Biomedical Engineering and his team have been working on the novel endoscope as part of the MIRACLE project since 2016.
2 The "Actuation Unit" contains the relatively large motors and sensors needed to move the endoscope and endoscope tip. It is installed on a commercially available collaborative serial robot (white) widely used in industry for applications requiring a high degree of precision.
3 By housing the motors in the Actuation Unit, the researchers were able to significantly miniaturize the endoscope and endoscope tip. Movements are transmitted via thin cables and flexible shafts. The tip consists of a miniature parallel robot that will enable high-precision cuts in conjunction with a laser bone saw.
4 The researchers use a tracking system to measure how accurately the endoscope tip can be controlled.
5 Doctoral researcher Manuela Eugster developed the Actuation Unit, robotic endoscope, and the endoscope tip as part of her dissertation. With support of other members of the BIROMED Lab, she combined all subcomponents to form one complete robotic system.

Can Switzerland beat COVID-19?

Assessing the country's handling of the pandemic so far – from an epidemiologic and an economic perspective.

During the coronavirus crisis, Switzerland did a lot right – but not everything. When the first patient succumbed to SARS-CoV-2 just over a year ago, the virus was still largely unknown. Transmission dynamics and health implications had to be understood before measures could be devised to protect individuals and prevent the disease from spreading among the population. After a few weeks, it was clear that face coverings were an effective way to slow the transmission of the virus. Why did Switzerland take so long to make a decision and only make face coverings mandatory on public transport at such a late stage? Then came calls to support digital tracking of transmission chains – but even the very best tracing app is of little use if people don't install it on their smartphones and use it consistently. And: Recommendations can only have the intended effect if they are accepted by and adhered to by the population. When and how they are announced by authorities and experts is just as important as the measures themselves. At times, however, it was difficult for people to keep track.

Another issue that merits examination is individual responsibility that the Swiss are so fond of invoking. It is hard to put much stock in recommendations if different rules apply in a neighboring canton. The credibility of a given measure can be seriously compromised if a few miles down the road it is applied in a different way or not at all. Over the past year, measures at the national and international level would have been both desirable and necessary. Switzerland's federal system of government often served as a scapegoat for ineffective measures, but it could actually be regarded as an advantage: Until we have a clearer idea of which combination of measures has the greatest impact, each of the 26 cantons could serve as a potential role model, with pitfalls and successes from which the others can learn. This would, however, depend on rapid and efficient exchange of data.

Jürg Utzinger
is Director of the Swiss Tropical and Public Health Institute (Swiss TPH) and Professor of Epidemiology at the University of Basel. His research and teaching focuses on neglected tropical diseases and the health effects of large-scale projects in low- and middle-income countries.

Decisions are a constant trade-off between the need to contain the virus and the unwanted side-effects of the measures themselves. It is not enough to merely focus on infection statistics, availability of intensive care units, fatalities and reproduction values. School closures during the first lockdown left slower learners behind. Remedying such disparities is no easy task. Countless livelihoods are at threat from shutdowns in the hospitality industry, in culture and retail. We have seen a sharp increase in psychological health issues. The pandemic has shown just how important it is to take a holistic view of health and well-being, so as to avoid not just serious illness and fatalities, but also the unwelcome side-effects of measures designed to contain the pandemic.

Besides individual responsibility, we would do well to focus on our collective responsibility, too. Although research, innovation and cooperation have paved the way for an unprecedented achievement – the development and regulatory approval following rigorous scrutiny of multiple vaccines within less than a year – wealthy nations have secured extensive vaccine stockpiles, while African countries are at risk of coming away empty-handed. Although Switzerland's rapid progress in vaccinating risk groups and healthcare professionals is good news, ensuring the supply of vaccines to the world's poorest nations should also be a priority. Limited resources such as vaccines must be fairly distributed in a pandemic, as this is the only way for it to be swiftly and effectively overcome. COVID-19 anywhere is COVID-19 everywhere. ■

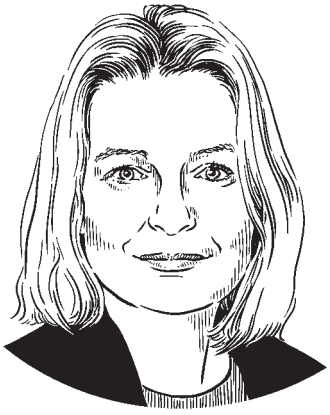
SARS-CoV-2 is not just harmful to human health, but also to the economy. The measures aimed at reducing contact between people clearly entail high economic costs. When restaurants or retailers are forced to close their doors, for example, their ability to generate income is either non-existent or severely compromised. But is the logical conclusion that the measures themselves are harming the economy?

We need to consider what state the economy would be in without these measures. With excessively lax measures – or none at all – in place, infections would skyrocket. We don't have to take epidemiologists' word for it – developments in countries where the virus was temporarily allowed to spread practically unchecked tell the same story. So how would key economic variables, such as consumption or investment, be affected if the virus were not under control? Would people still go to restaurants or hotels? Many guests would stay away for fear of contracting or spreading the virus. This means that we would see a major decline in revenue even if businesses were not directly shut down. Meanwhile, excessively lax measures allow the virus to continue its spread, resulting in more cases and stricter measures in the future. In short, the economy would suffer even without the measures. In the mid-term, this downturn could actually even end up causing higher overall costs than short-term containment measures. This shows that it is not necessarily the measures that are harming the economy, but the virus itself.

Studies have shown that a "self-imposed" reduction in consumption patterns has played a central role so far. Research from the US suggests that much of the decline in economic activity is due to changes in consumer behavior, while only a small part is explained by government-imposed restrictions. While these findings are not directly transferrable to Switzerland, they make it clear that the difference between an economy with and without measures is not as great as it seems if we make the mistake of comparing the current situation to a world with no restrictions but also with no virus.

This is one of the economic arguments in favor of Switzerland as a whole footing the bill for the measures. These costs should not be borne solely by the sectors affected by shutdowns or major restrictions, but by society as a whole. This is why programs such as the furlough ("Kurzarbeit") scheme are crucial to prevent unnecessary bankruptcies and long-term economic damage.

In conclusion, the measures imposed in Switzerland were the right thing to do not just in terms of public health, but also with regard to the economy. Switzerland's efforts to keep elementary schools open – in contrast to many other countries – are economically sound, as school closures exacerbate educational inequality. A key complementary measure would be to implement more extensive testing strategies, and above all an effective contact-tracing system, to prevent case numbers from spiraling out of control. These measures are much more cost-effective than lockdowns, and have received only limited consideration so far. Swift vaccination of the population will hopefully see an end to the pandemic. The sooner this happens, the better for the economy. In this sense, it is worth making substantial investments to accelerate the vaccination campaign. ■



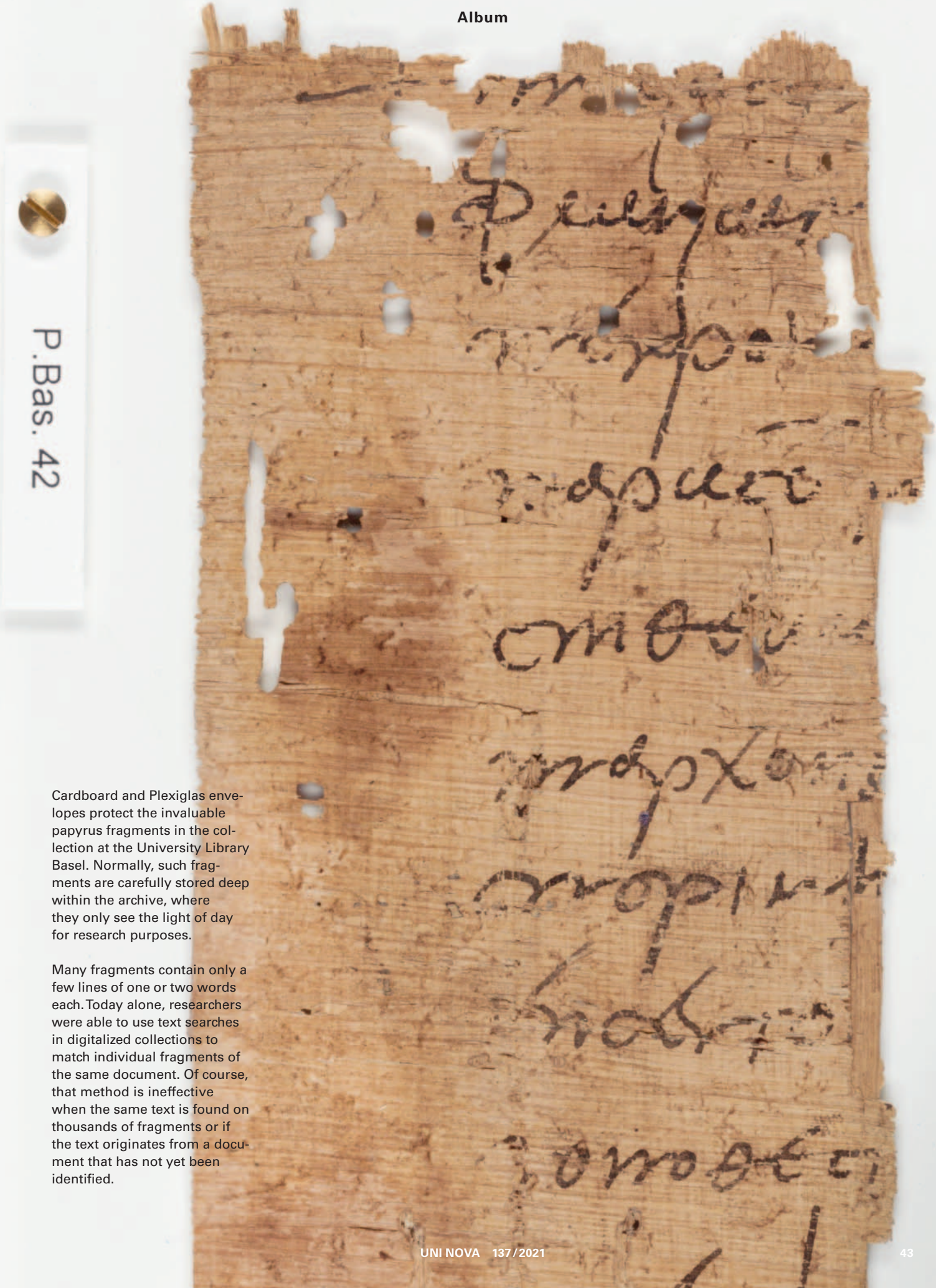
Sarah Lein
is Professor of Macroeconomics at the University of Basel. Her research interests lie in the fields of monetary economics, business cycles and international macroeconomics.

The papyri code.

When she was just 10 years old, Dr. Isabelle Marthot-Santaniello first travelled to Egypt, where she discovered her life's passion: She wanted to decode hieroglyphs and read what they had to report back about the ancient world. Today, at the University of Basel, she studies digital methods of identifying the handwriting on Greek and Coptic papyri from Antiquity.

As part of the D-Scribes project, she and her team are working to develop an analysis platform for ancient manuscripts based on the unique properties of the scribes' handwriting. Their goal is to create a digital tool to date papyrus fragments in collections around the world, join contiguous fragments and pinpoint the authors of writing samples that continue to defy all attempts at identification.

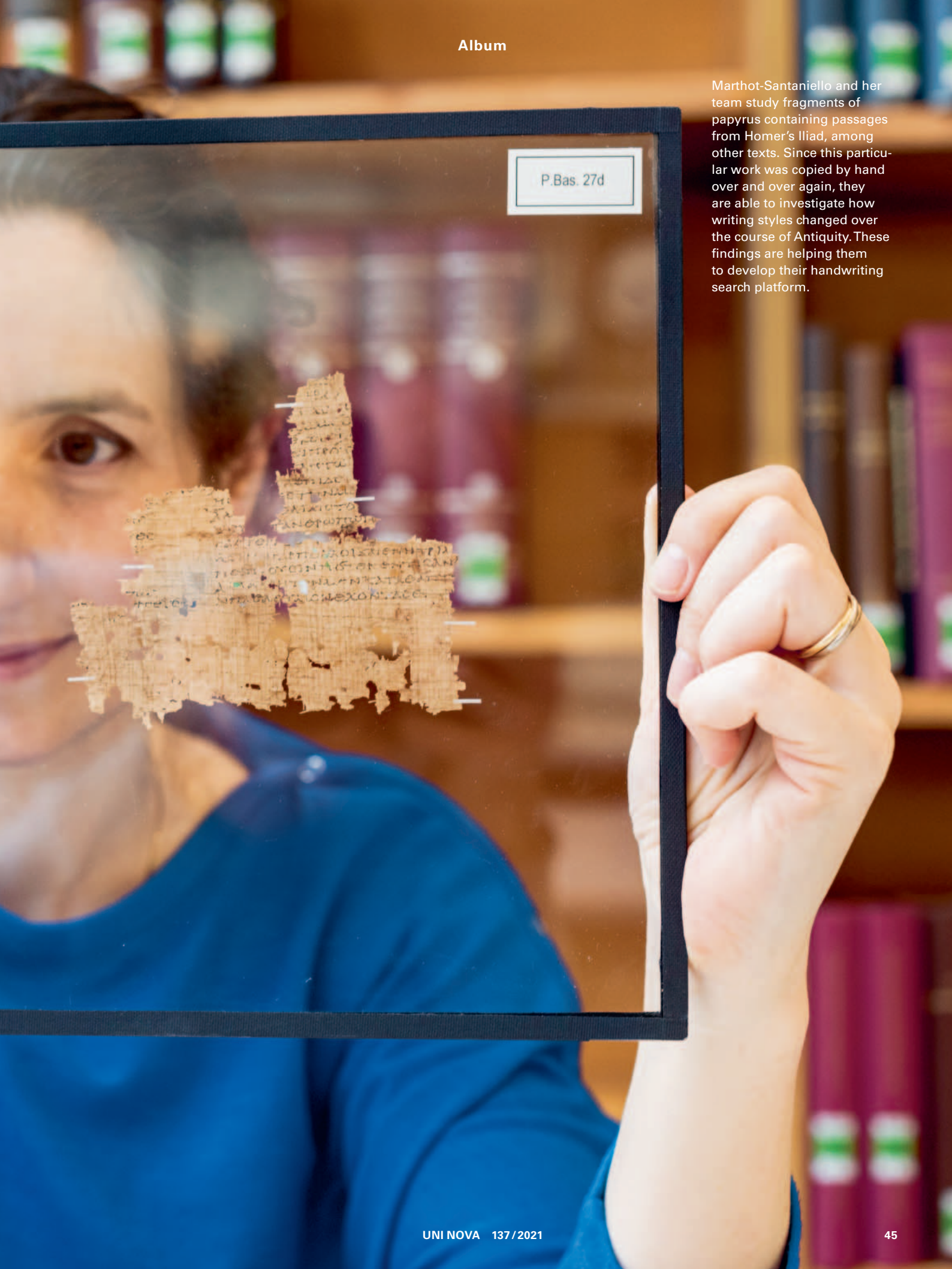
Photos: Christian Flierl
Texts: Angelika Jacobs



Cardboard and Plexiglas envelopes protect the invaluable papyrus fragments in the collection at the University Library Basel. Normally, such fragments are carefully stored deep within the archive, where they only see the light of day for research purposes.

Many fragments contain only a few lines of one or two words each. Today alone, researchers were able to use text searches in digitalized collections to match individual fragments of the same document. Of course, that method is ineffective when the same text is found on thousands of fragments or if the text originates from a document that has not yet been identified.


P.Bas. 27b



Marthot-Santaniello and her team study fragments of papyrus containing passages from Homer's Iliad, among other texts. Since this particular work was copied by hand over and over again, they are able to investigate how writing styles changed over the course of Antiquity. These findings are helping them to develop their handwriting search platform.

Comparing the written text visually is a laborious process. In order to help sharpen their eye for essential details, Marthot-Santaniello and her co-worker Johannes Nussbaum play a kind of memory game in which they each attempt to identify two papyri from the same writer.

The software the team has developed is able, among others, to visualize passages written by different authors on a single papyrus. Comments, corrections and alternative formulations written in different handwriting often appear on papyri, revealing information about literary trends and the development of texts over time (right).


MacBook Pro

If the team can match up text fragments from well-known works such as the Iliad, they may also be able to apply the same methods on unidentified texts. Fragments could be pieced together so that these long-lost writings can finally be read once again.

Isabelle Marthot-Santaniello works at the Department of Ancient Civilizations. Her research into digital methods of paleography, or the study of ancient handwriting is funded through an Ambizione grant from the Swiss National Science Foundation.
d-scribes.org

Kitsch speaks straight to the soul.

Superficial, saccharine and sentimental — people are usually being disparaging when they describe a piece of music as "kitsch." This hackneyed term has been in use for some 150 years and is the subject of research by a Basel musicologist, who has made some surprising discoveries.

Text: Christoph Dieffenbacher

We all think we know what the word "kitsch" refers to – poor-quality works of art that use simple devices to appeal directly to our emotions for maximum impact. When people describe something as kitsch, they mean it is bad art. Andreas Baumgartner, 39, a researcher at the Department of Musicology, has been dealing with the concept of kitsch for years – and believes it is now more enigmatic than ever: "It seems to constantly evade definition. And paradoxically, it barely gets any clearer when you examine it in more detail." Nevertheless, the researcher hazards a definition in our interview: "Kitsch generally represents poor taste, clichés, insincere pathos and falsehood. It masquerades, feigns and simulates – and is accused of being sham art."

A German word goes global

There even seems to be some uncertainty surrounding the origins of the catchword, which emerged at the end of the 19th century in artistic circles in southern Germany. It probably derives from the verb *kitschen* ("to smear") – the word *Kitsche* was used to refer to mud produced during road construction. Other possible origins include the English word "sketch" and the Yiddish *verkitschen* ("to sell some-

thing cheaply"). Whatever the origin, the German term was adopted into several world languages – including Russian – and spread around the world in short order.

What do we perceive as kitsch when it comes to music, however? Baumgartner has a theory: "It undoubtedly involves the frequent use of certain musical phrases and chord progressions, the repeated resolution of simple dramatic arcs, and a lack of breaks or friction." Popular opinion holds that musical kitsch puts listeners in a mood that is at once reverent and religious, sensitive and effusive. The music appeals to the listener's emotions and conjures up a certain image, be it a full moon or a sunset. One common criticism, however, is that this beauty is superficial and seeks only to create a mood and trigger an emotional response in the audience.

According to Baumgartner, the mass dissemination of music from the 19th century onward saw the emergence of simple, catchy pieces, such as hits from operettas, parlor jingles and movie scores: "It was precisely at that time, when representatives of high art were seeking to differentiate themselves from art made for the masses, that the word 'kitsch' emerged." In those days, visual art, photography and literature were being produced in large quantities for an ascendant middle class, as more and more people sought to acquire a stake in the world of art and culture.

A Schubert song performed by the Queen of "Schlager"

Among other things, Baumgartner's dissertation examines the way in which a Schubert lied became a famous pop song. The composition originally entitled "Ellens Gesang III" emerged in 1825 as part of a song cycle and quickly achieved popularity under the titles "Hymn to the Virgin" and "Ave Maria." Soon after it was composed, the song appeared in the form of innumerable arrangements. Later becoming a worldwide hit, it was even used to stimulate deep emotions in churches – and oddly enough was played at both weddings and funerals. The song has also featured in numerous movies, including Disney's "Fantasia" in 1940, and graced the repertoires of stars such as Romy Schneider, Roy Black and Céline Dion.

Baumgartner has studied one arrangement of "Ave Maria" – performed by the German Schlager singer Helene Fischer – note for note. Whereas the lyrics were changed, the music appears to be almost identical. According to the musicologist, however, there are a number of deliberate simplifications, as well as embellishments, that turn the song "into a wistful piece of music that is gentle and melancholic while also being sensual and charming" – and capable of touching an audience of millions. He is reticent as to whether this Schubert song, which is perfectly executed with enormous pomp, has now "secured its place among the icons of popular music" or has instead "come to symbolize the decline of German culture."

"Sweet" and "sour" kitsch

After all, instead of assigning ratings and making value judgments, Baumgartner is keen to find out which music was termed "kitsch" when, by whom and for what reasons. He also wants to know what it sounds like when a composer produces kitschy music deliberately – such as in the "Kitsch-Duett" in an opera by Paul Hindemith. As an example, he has also studied the well-known "Adagietto" from Mahler's Symphony No. 5 in C-sharp minor – another piece that has enjoyed a long career, including an appearance in Luchino Visconti's film adaptation of "Death in Venice." Many people today feel that Puccini's operas, Johann Strauss' waltzes and Tchaikovsky's symphonies border very closely on kitsch.

He also encountered the term "sour kitsch," which briefly entered the parlance of cultural debates in around 1920. This time, the accusation of being kitsch was not leveled in order to disparage music simply for being pleasing to the ear, but rather to discredit the emerging avant-garde – that is, artistic movements such as neo-impressionism, futurism and abstract painting, including the work of Picasso. For example, the German art historian and critic Curt Glaser wrote that this "sour" or "futuristic" kitsch was becoming estranged from good art and even overturning its basic principles. In this regard, Baumgartner is able to show that discussions around "kitsch" are influenced not only by its aesthetic impact but also by social and political dimensions.

Antlers and garden gnomes

Baumgartner, who plays the clarinet, piano and organ and has also researched the Italian film score composer Ennio Morricone, has a personal fascination with kitsch – and takes the subject very seriously. Not only are the criteria used to define kitsch extremely diverse and variable, he says, but people are now also taking a less disparaging view of the genre: "Nowadays, the phenomenon of kitsch is widespread in society. It forms part of people's lifestyles or has become a sort of ironic statement." Baumgartner takes the view that, in a time when antlers, garden gnomes and Schlager stars are socially acceptable, certain preconceptions of culture should indeed be reconsidered: "Kitsch can be seen as a valid part of art in its own right." ■

Section of postcard with lyrics from Franz Schubert's "Ave Maria", Bunte Reihe No. 234; circa 1930.

Postcard with the opening words of Franz Schubert's "Ave Maria", circa 1900, Verlag Jacques Philipp, Vienna. (left)

Therapy straight from the chicken coop and the pigpen.

At a Basel-based clinic for rehabilitation, sheep, chickens and other animals help patients return to normal life. The clinic also conducts practical research on animal-assisted therapy. Our visit to the animal experts of this cutting-edge field.

Text: Yvonne Vahlensieck

Frederik is not in the mood to work today. It is raining and instead of coming out to greet his guests, he has decided he would rather barricade himself under a mountain of straw. "He really doesn't care for inclement weather," chuckles psychologist Karin Hediger. She does not mind that Frederik is out of sorts today. The miniature pig is only expected to work when he wants to, just like any other resident of the animal-assisted therapy facility at REHAB Basel, a clinic specializing in neurorehabilitation and paraplegiology.

The small unit, which was founded in 2013, is located directly across from the entrance to the clinic and offers patients with brain and spinal cord injuries the opportunity to complete their course of therapy together with animal helpers. Hediger helped to build this program and now heads up a research group at the University of Basel which conducts studies investigating the efficacy of animal-assisted therapies.

Attention-grabbing tricks

As we make our way through the stables, Hediger greets each minipig, dwarf goat and guinea pig by name. She clearly knows them all personally, and they all know her, too. She opens a gate, and a flock of curious hens scurry out toward her. "They're new," she says, "and they're still being trained by the keepers." The animals not only learn how to interact with humans; they are also taught how to recognize different colors, among other things. These tricks are then integrated into the therapy sessions in the form of games. Hediger opens a cabinet containing all manner of toys, such as colorful rings and foam cubes. "A lot of people are surprised to learn that our sheep know how to play dice," she quips.

Animal-assisted therapy has vastly increased in popularity over the past few years. This therapeutic approach is not only employed in neurorehabilitation; it also has applications in treating psychiatric problems, such as depression, anxiety disorders, autism and post-traumatic stress disorder. Hediger hopes her research will help her to find out more about why these therapies are effective, thus allowing her to improve on existing techniques. Her scientific findings directly inform her practice at the facility.

A session has begun in one of the therapy rooms at the stables. The patient and her occupational therapist are seated in front of a large crate filled with straw, hay and three lively guinea pigs leaping about. Every now and again, they stretch their necks out toward the patient, who is busy preparing apples and lettuce for their delectation. When one of the guinea pigs manages to nab a snack, it quickly dashes to its den to enjoy the treat in peace. The young woman, who keeps guinea pigs of her own at home, clearly seems to be enjoying their antics.

Feeding for fine motor control

She uses only her right hand to cut the food and feed the animals; due to a brain injury, she has little range of motion with her left. The therapist recommends she try feeding the guinea pigs with her left hand for a change. With visible effort, the patient grasps a slice of apple in her left hand and offers it to a guinea pig, who happily scampers off with the fruit.

Hediger reports that this type of therapy is in high demand, explaining: "When patients prepare food for an animal, that type of activity is more meaningful to them than simply squeezing a ball when it comes to practicing their manual dexterity." The more meaningful the task at hand, the more effective the therapy. Hediger was able to conclusively prove this connection in her own studies: Patients

with brain injuries were more motivated, communicative and satisfied when engaging in animal-assisted therapy than they were with conventional approaches.

Hediger continues our tour outside. In the outdoor pens, rabbits and guinea pigs snuggle into the hay. Minipig Frederik and his brother Piggeldy enjoy a walk in an open-air paddock. The promise of imminent dinner has coaxed him out after all. Through a low window, we can see the sheep in a neighboring building (where they are not currently engaged in a game of dice). Hediger explains that the entire facility is wheelchair accessible.

Even the guinea pig pen has been raised to allow patients in wheelchairs to make eye contact with the animals. "But the animals always have the option to withdraw and rest – that's very important," she underscores. The welfare of the animals is a key concern to Hediger; that is why she is one of the first researchers in this field to conduct animal welfare studies. For example, she has measured the stress levels of guinea pigs in different types of therapy scenarios. One sign of increased stress is a rise in the animal's body temperature as measured using an infrared thermometer. Based on the conclusive results of the study, it was clear that the guinea pigs should be placed in familiar groups during the therapy sessions and that they must always be provided with a den to allow them to retreat if needed.

Everyone finds their own way to connect

There is a flurry of commotion nearby. A large aviary hosts a chaotic flock of parakeets, parrots and other exotic birds. In a far corner of the paddock, a keeper tends to a horse. Why does the facility house such a diverse array of animals? According to Hediger: "We want to have a wide range of animals for patients to interact with, animals with different personalities that allow for different sensory experiences." That means just about anyone can find the right activity for them: Some types of therapy are better suited to rabbits while others work best with goats. Some people love to groom horses while other patients are content to listen to the birds chirp. And for those who grew up on farms, pigs and sheep can bring back old memories.

"On a certain psychological level, we are programmed to seek the company of animals," says Hediger. It is well known that petting a dog results in the release of a type of "happiness hormone." Hediger is currently investigating whether patients in a persistent vegetative state may also benefit from contact with dogs and from petting them with the help of an assistant. Her initial findings show that these activities do have a positive impact on patients' consciousness as well as on metrics such as heart frequency, eye movement and facial expressions.

Both the animal and human therapists are finally finished for the day. A keeper clears away the signs cordoning off the areas used for the therapy sessions. Now the facility is open to anyone keen to catch a stroll amongst the animals – and a little dose of happiness besides. ■

"On a certain psychological level, we are programmed to seek the company of animals."

Karin Hediger

Ergotherapy with animals helps to develop neurological planning of movement, for example holding something in your hand.

Emotions as key to the Middle East conflict.

Text: Stephanie Kirchmayr

Many consider the conflict between Israel and Palestine as intractable. Political scientist and social psychologist Oliver Fink investigates the role of emotions such as humiliation and empathy in this seemingly irreconcilable struggle. To undertake his project, Fink lived and worked in Jerusalem for three years.

Spanning over half a dozen wars and countless attempts at peace negotiations, the conflict between Israel and Palestine is one of the most complex and enduring in the Middle East. "If I were to conduct a street survey in which I asked people to name a never-ending conflict, the one between Israel and Palestine would likely come in first place," says Oliver Fink, doctoral student and political scientist in the Department of Social Sciences at the University of Basel. The recalcitrant battle lines between Israel and Palestine are less a question of substantial differences in opinion and more a matter of opposing ideologies and values. That makes this conflict a very emotional one. Oliver Fink aims to use his research to better understand these emotions. In his dissertation project, he investigates how the Palestinian people perceive conflict-related events and how feelings can influence a person's tendency to commit acts of violence.

Humiliation on the world stage

A person does not simply turn to violence for no good reason. Maybe their own father was arrested, or their brother shot. Many instances of radicalization are preceded by a traumatic experience of political violence. "That's frequently followed by hate and a desire for revenge," explains Fink. He uses quantitative surveys to study the impact of negatively charged emotions. His findings show that a person's inclination toward violence is influenced both by hate and anger as well as by feelings of humiliation. Demeaning experiences are part of everyday life in the conflict zone and often play out in seemingly insignificant ways. Experiences of waiting in line and harassment at checkpoints can be perceived as humiliating by those targeted. The same goes for when obstinate soldiers bar someone from accessing their own olive trees, even though the grove has been in their family for centuries. "These experiences are extremely unpleasant, but up to a certain point, they are still bearable," elucidates Fink. "Violent tendencies become amplified above all when people regard humiliation in public spaces as intentional denigration, or when that humiliation plays out on the world stage." This became apparent, for example, when the United States government announced that it was relocating its embassy from Tel Aviv to Jerusalem. In doing so, the US implicitly recognized Jerusalem as the capital of Israel alone, rather than that of both states. Fink has vivid recollections from that time. "Right afterwards, there were fierce demonstrations all across the West Bank," he remembers.

Living between two cultures

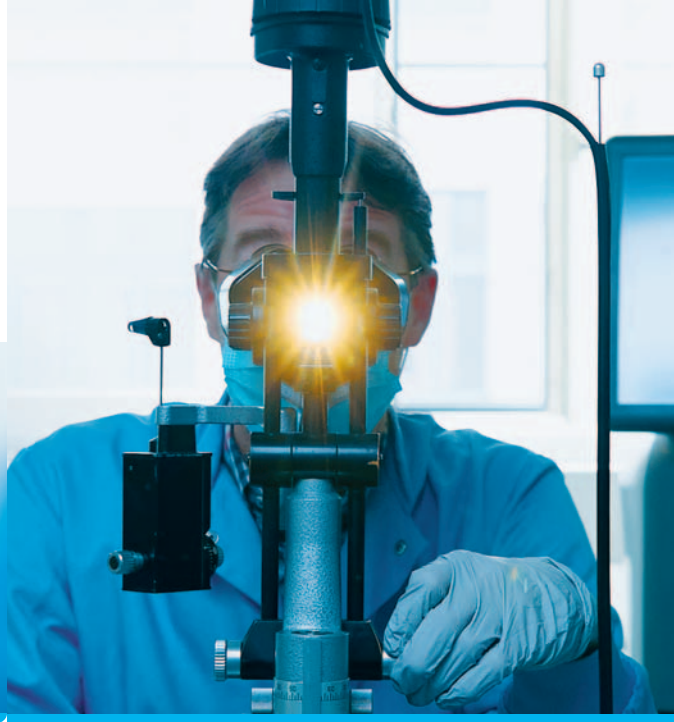
The political scientist knows the region well. For three years, he lived with his family in an Israeli town located directly across the border from the West Bank. The morning commute through the checkpoint was part of the family's everyday routine. Fink worked in Israel while his wife's job was in Palestine, where the children also attended a German-Palestinian international school. The family made a conscious effort to expose themselves to the otherwise disparate cultures and lifestyles of the two communities. For Fink, this type of participant observation was central to his field research. "I wanted to experience and understand both the restrictions on the Palestinian side and the fear and distrust on the Israeli side," he elaborates. "It was the only way for me to properly organize my thoughts." His contacts in Palestine also provided him with access to crucial research data. Unlike Israel, Palestine does not have the kind of electronic infrastructure that allows researchers to compile large quantities of data rapidly. Researchers need to go from door to door to conduct their surveys. And when it comes to sensitive topics such as violence and emotions, this is no simple undertaking. "Luckily, my contacts in the school and among the Palestinians were very helpful," says Fink.

From violent acts to peaceful activism

Considering the difficulties involved in collecting data, it seemed serendipitous when Fink and his research group uncovered a collection of written interviews with Palestinians who had formerly engaged in violent behavior. In the pages of these documents, the interviewees described undergoing a change of heart which ultimately saw them come together with Israelis to engage in joint activism projects for peace. Emotions were key here, too. Fink's analysis of the reports indicated that an experience of empathy was often a primary impetus for deradicalization. Ahmad, whose name we have changed here, befriended an Israeli prison guard during his time in a detention facility. And Yousef explained how he had watched the film "Schindler's List," and saw Jewish people portrayed as victims of violence for the very first time. Experiences or encounters such as these can catalyze a dramatic shift in perspective. "They suddenly realize: They're going through similar things to those I am," underscores Fink. "Common experiences of loss can break intractable cycles of hate and revenge." The problem here is that empathy is an exceedingly difficult emotion to arouse if someone is not open to it. Most of the time the changes were triggered by random encounters. Looking forward, a more precise analysis of these types of events could help to promote and improve communication between these two populations through mediations and workshops.

The question of how best to achieve lasting peace is a difficult one, and one that far exceeds the scope of Fink's research. But his study illustrates the significance of psychological factors in the Middle East conflict, both in fomenting violence and in encouraging peaceful solutions. "Your peace accord might look great on paper, but when you've got two parties who neither trust nor empathize with one another, even the best deal will end up as wastepaper sooner or later." ■

IOB Institute of Molecular and Clinical Ophthalmology Basel



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Memory Clinic und Neuropsychologisches Ambulatorium

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Cultural Studies

Bringing insights to Brexit.

Brexit: A simple term but a highly complex issue. In this insightful essay collection, a range of experts from literary and cultural studies, history and political science reflect on British attitudes to Continental Europe in an effort to explain the Brexit decision. The book argues primarily that Britain's ties to Europe are much stronger than many people in Britain would like to admit. In examining past British-European interactions and the role played by British Euroscepticism, the authors offer a rich analysis of the views and practices that shape cultural memory. Part I focuses on the historical and political relationship between Britain and Europe, including Conservative Party discourse on Europe and freedom of movement. Part II moves on to case studies of films and popular Eurosceptic and historical fiction, including Philippa Gregory and Paul Kingsnorth. Finally, Part III looks at border-mindedness and Britain's island story, touching on travel writing and the cultural significance of the white cliffs of Dover.

Ina Habermann is Professor of English Literature at the University of Basel, Switzerland. The book is aimed at specialists in cultural studies as well as a wider audience interested in Brexit. ■

Ina Habermann (ed.):
The road to Brexit. A cultural perspective on British attitudes to Europe
Manchester University Press, Manchester 2020
272 pages, GBP 80

African Studies

A Cape Colony crusader.

A remarkable woman, Mary Elizabeth Barber (1818–1899) was born in Britain and lived in the Cape Colony from 1820 onward. Although she has been described as "the most advanced woman of her time", little has been written about her rich life and learning. An avid botanist and early archaeologist, she was also the first female ornithologist in South Africa and one of the first people to promote Darwin's theory of evolution. Barber was a feminist before the concept existed and she also used argumentation that was essentially racist. This fascinating book is the first collection of her edited scientific correspondence and includes an important critical introduction. These letters, written primarily to the entomologist Roland Trimen, are now kept at the Royal Entomological Society in St Albans, UK. Alan Cohen transcribed Barber's letters and has written many biographical articles on Barber and her brothers. Tanja Hammel is a historian who has published several articles and a monograph (2019) on Mary Elizabeth Barber. Jasmin Rindlisbacher is a publishing house assistant and online communications officer at Basler Afrika Bibliographien. ■

Alan Cohen, Tanja Hammel, Jasmin Rindlisbacher (eds.):
Mary Elizabeth Barber: Growing Wild. The Correspondence of a Pioneering Woman Naturalist from the Cape
Basler Afrika Bibliographien, Basel 2020
334 pages, CHF 25

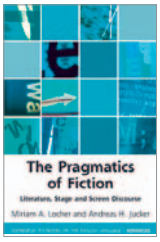
European History

Italy's view on Europe.

In June 1989, Italy's citizens had their opportunity to express an opinion on the future direction of Europe in a referendum asking whether the European Parliament (EP) should draw up a constitution for a European Union. However, this referendum is rarely even mentioned in historical accounts and has received little research attention beyond Italy. To address this significant omission, this book takes the referendum as the basis and lens through which to focus on Italy's perspective on the question of Europe. In providing the key historical context for our understanding of Italy's approach to Europe, the book identifies two histories that proceeded the referendum: First, an immediate history starting with the first direct EP elections in 1979 or with the adoption of a draft constitution at the following the first term of the European Parliament in 1984. Second, a longer historical perspective dating back to 1941 with the publication of the Ventotene Manifesto. After examining these two periods, the book then brings the reader up to date with a reflection on developments since that 1989 referendum.

Georg Kreis is an Emeritus Professor of History at the University of Basel. He founded the Institute for European Global Studies in Basel and served as its director until 2011. ■

Georg Kreis: Why Italy Was for Europe. On the History of the 1989 Advisory Referendum
Schwabe Verlag, Basel 2020
103 pages, CHF 28



English Linguistics

Practical pragmatics meets fiction.

A rich resource for students, teachers and researchers alike, this landmark book presents pragmatics as a framework to analyze the discourse of fiction. It is divided into three parts that explore fiction as communication, the pragmatics of story worlds, and themes in fiction. Drawing on a wide range of fictional genres (including novels, fan fiction and TV series) and texts (from Shakespeare to Game of Thrones), it shows how pragmatic analyses can uncover the performative elements that create and shape characters for an audience. The book examines different forms of interpersonal communication, such as politeness and impoliteness, as well as the nature of poetic language and the language of emotion. It uses exercises, discussion topics, suggestions for small-scale research projects and further reading to show just how fascinating a challenge fictional language can pose to pragmatics, and illustrates the richness of fictional language as a source of data for pragmatic research. Miriam A. Locher is Professor of English Linguistics at the University of Basel. Andreas H. Jucker is Professor of English Linguistics at the University of Zurich. ■

Miriam A. Locher, Andreas H. Jucker: The Pragmatics of Fiction. Literature, Stage and Screen Discourse
Edinburgh University Press, Edinburgh 2021
296 pages, GBP 24.99

Crisis and capacity.

In times of crisis, the incompleteness of the world becomes manifest. When reality is in flux, we need to get involved.

Text: Gunnar Hindrichs

For more than a year, we have been living under pandemic restrictions. The university campus can be accessed only under certain conditions. Learning and teaching have gone online. In the city, shops and bars are closed. Travel is becoming more difficult. Many of our everyday activities are no longer possible. Uncertainties are also having an impact. Our interaction is becoming less fluid. Intimacy is being undermined. Expectations are being disappointed. Fears, both rational and irrational, are taking hold. And the political regulations governing the whole business are becoming harder to understand. They require a continuous flow of information, take their cue from experts rather than public opinion, and are handed down as decrees from on high. In short, our actions, now and going forward, seem disordered. Are we living in a crisis?

This is not a new question. The litany of crises, real and perceived, goes back long before the pandemic. We have had the property crisis, the banking crisis, the crisis of democracy, the crisis of the international order, the climate crisis … These crises are still unresolved today. That is why some people talk about a 'multiple crisis', by which they mean that all these crises, and others, form part of a single, multiform crisis that is shaping our present. Our lives therefore seem to be governed more and more by crisis management. But what is a crisis really?

Crises are moments of decision. We know that from medicine. A medical crisis decides whether a sick person will recover or die. Similarly, the banking crisis decided which firms would survive and which would collapse, while the climate crisis is about deciding what kind of life we will and will not be able to live in the future in the context of the natural environment. It seems, therefore, as if the concept of crisis can be explained with reference to the concept of decision. But this is only the first step toward understanding what is meant by a crisis, as decisions are to be understood with reference to the possibilities being decided. The concept of possibility is therefore lurking in the background during a crisis. This raises a new question: in what way are crisis and possibility linked?

To answer this question, we need to go back to first principles for a moment. (That is the job of philosophy, after all.) In principle, possibilities can be understood in two ways. One of them is expressed in

"Crises are moments when something that has long been smoldering finally becomes visible and demands resolution."

Gunnar Hindrichs

the proposition, "… is possible for a person or a thing"; the other is expressed in the proposition, "It is possible that … ". In the first instance, the possibility refers to an ability, while in the second it refers to the modal status of a state of affairs. In philosophy, we use the terms 'potentiality' and 'possibility' to articulate this distinction. Potentiality is possibility in the sense of an ability or capacity. Possibility is the modal status of a set of circumstances. Here is an example: The sentence, "Caesar can cross the Rubicon," speaks of Caesar's potential; it is about his ability to do something. The sentence, "It is possible that Caesar will cross the Rubicon," means something different. It tells us that a particular fact – namely, Caesar crossing the Rubicon – is possible. Both statements deal with a possibility, and they are also linked. If Caesar is able to cross the Rubicon, then the fact that he crosses the Rubicon is certainly possible. Yet in each case the emphasis is different. When we say that Caesar has the ability to cross the Rubicon, we are not seeking to record the modal status of a particular state of affairs. Rather, we are suggesting that the possibility of crossing the Rubicon is somehow present in Caesar as his potential, even though it has not yet been realised, and that the ultimate aim of this possibility is to be realized by him, even if it never actually is.

Aristotle would put it like this. Caesar still lacks the actuality of having crossed the Rubicon, but he has the potential to do it. To overcome this lack, Caesar changes with a view to achieving the goal of crossing the Rubicon. He then realizes his potential. Here Caesar's capacity is part of his determinability, which becomes determinate once the crossing of the Rubicon has been realized. Viewed in relation to this new determinacy, Caesar's determinability is characterized by the "not yet" of something lacking. For although Caesar is able to cross the Rubicon, he has not yet done it. Consequently, potentiality constitutes a moment of becoming, viewed in relation to something that has "not yet" been achieved. With possibility, however, there is no need to take this perspective into account.

Let us go back to our experience during the crisis. Crises are all about what people can and cannot do. They are therefore concerned primarily with potentiality, rather than possibility. Based on our discussion of first principles, this means that crises are about becoming, about moving in the direction of something that has "not yet" been realized. If we take seriously the proposition that the concept of possibility is lurking in the background during a crisis, we are confronted with an idea with far-reaching implications: namely, that we and our world are steeped in potentiality, and are therefore in the process of becoming. These potentials are not mere fantasies. Rather, they are characterized by a concrete lack, a "not yet", which the process of becoming in which we and our world are engaged aims to remove, and whose very existence brings them into focus.

Gunnar Hindrichs has been Professor of Philosophy at the University of Basel since 2014. He studied philosophy, medieval and modern history as well as musicology in Germany and later spent several years as a professor in Philadelphia. Hindrichs has published books on metaphysics and the philosophy of music, as well as on revolutionary theory and critical theory.

Perhaps this is the kind of thing that Karl Marx meant when he wrote, "It will then become clear that the world has long possessed the dream of a thing it only needs to be conscious of in order to possess it in reality." In this statement, Marx interprets what is lacking in our world as its unrealized dream, its "not yet". Making the world conscious of its dream of a thing would therefore mean making the world conscious of the potential that it is striving to realize. And that would mean that we and our world could move forward in the process of becoming.

In crises, on the other hand, I would argue that this process is stalled, reinforcing what is lacking in our world, even though it craves its own removal. Our action is blocked, which means that our potentials, viewed in light of a "not yet" still to be achieved, are not being realized. That sounds discouraging. But at the same time, crises are moments when something that has long been smoldering finally becomes visible and demands resolution. For the very fact that this thing that is lacking, this "not yet", is reinforced at times of crisis exposes it to view. We just need to open our eyes to see it. And that is not discouraging; rather, it encourages us to recognize what is missing and to recognize that, because of this missing thing, our world is still a work in progress. Of course, this work cannot be completed without our intervention. What matters, therefore, is that we focus on the defects in our still unfinished world and seek to turn our potential into reality. ■

Standing the test.

Immunologist Georg Holländer is a researcher through and through; he is considered a visionary and an inspiration. Professor Holländer is Director of the Botnar Research Centre for Child Health in Basel. It was not always certain that he would be able to take on this role.

Text: Irène Dietschi

When Georg Holländer was diagnosed with a lymphoma ten years ago, it was not clear whether or not he would survive the cancer. Statistically speaking, his chances of recovery stood at around 15 percent. Specialists in Oxford were able to diagnosis this relatively rare lymphoma within a period of just two days. Holländer studied the MRI results together with his doctors, commenting that the images were "very interesting". The only troubling thing was seeing his own name on the scans. He shared the story of this formative period in his life near the end of a lengthy Zoom call. The meeting was originally scheduled to take place in Basel, but Holländer is currently stuck in Oxford due to the new B1.1.7 coronavirus variant.

Oxford is his primary port of call and the city his family calls home. Normally, the immunologist spends half of his time working in Basel – when he is not in lockdown, that is. "Sometimes I get the feeling that I'm constantly in the wrong country," Holländer quips. His subtle sense of humor is palpable, even over a computer screen. Professor Holländer serves as Director of the Botnar Research Centre for Child Health (BRCCH), which, since its founding in early 2019, has spearheaded research projects that focus on child and adolescent health, particularly in low- and middle-income countries. To hear him speak about the BRCCH is to know how passionate he is about his work. Foundation Botnar has allocated CHF 115 million to the center for its first ten years of operation. "That's a lot of money," says Holländer, "and it needs to be distributed properly."

The BRCCH has begun to generate results. Funded researchers have developed an elegant molecular-genetic process for localizing pathogenic bacteria in the digestive tract. This represents the first step toward helping malnourished children to establish a healthy gut microbiome. Another project aims to provide support for children born with a cleft lip or cleft palate; the idea is to perform a simplified surgical procedure to treat the condition. This would save time and money for families in low-income countries – and spare children affected by the condition a great deal of pain.

Holländer first learned of the plans to establish a children's research center in Basel late in 2017. The Centre would be jointly founded by the University of Basel and ETH Zurich. The project needed a director, and Holländer, with his "global perspective" and considerable experience in the field, was the perfect candidate. Primo Schär, Dean of the Medical Faculty at the University of Basel and long-time colleague, describes Holländer as: "a first-rate thinker with a great eye for detail in immunological research who is able to keep the big picture in mind at all times; always on the brink of a new discovery, he is inspiring and visionary." But when Holländer was invited to accept the post, he initially turned it down. Oxford was exciting enough as it was, and his daughters and wife, an English citizen and general practitioner, were not keen on pulling up roots in the UK. So, when the new research center proposed a 50-50 arrangement, Holländer happily accepted.

Even as a student, Holländer was – in Schär's words – "a researcher, through and through." While others gravitated toward pediatrics because of their love of children, he chose the specialty for its sheer complexity. The lungs and all other organs, the metabolism, the nervous system – in pediatrics, all of these areas are "far more closely integrated and holistic" than in other medical specialties. He was also interested in developmental biology, in the "enormous plasticity in developing children's systems that can no longer be found in adults." Early on, it was clear that as a physician, he was less interested in phenotypes than he was in fundamental biological questions – his true passion was for the fine print, so to speak.

So, Holländer placed his studies on hold to spend a year working at the Basel Institute for Immunology. The focus of his research was the thymus, a small organ located behind the sternum, in which immune cells known as T cells first learn to detect and attack foreign bodies. Following his final examinations, the researcher took a three-month trip to Southeast Asia, the home of his great-great-grandmother, only to spend weeks in the hospital recovering from a tropical disease. "The experience triggered something inside of me," he explains. "I was driven to answer the question of how the body defends itself from pathogens and how it learns to differentiate between itself and foreign bodies."

Then, in the prime of his life, Holländer was diagnosed with a malignant

Georg Holländer
was born in 1957 and raised in Basel. He is Director of the new Botnar Research Centre for Child Health in Basel. As the Centre's academic head, he is responsible for strategic orientation and initiatives. As an expert in molecular developmental immunology, he has held professorships at the University of Basel, ETH Zurich and the University of Oxford since 1997. After graduating in medicine from the University of Basel, he worked here at the Basel Institute for Immunology, then as an assistant professor at Harvard Medical School's Children's Hospital and later as head of research at the Children's Hospital in Basel. Holländer splits his time between Basel and Oxford. He is married to a doctor and is father to two daughters.

lymphoma – of all things, a type of cancer related directly to his main academic interest of the past ten years. He would need a bone marrow transplant and to undergo a period of isolation, and he would have to accept that the chemotherapy would practically obliterate his immune defenses. Holländer asked his doctors when his body would be back to producing sufficient T lymphocytes. "An attending physician looked at me in dismay, saying: 'You must know I'm not in the least bit qualified to answer that question.'"

The therapy lasted for a year. Over the course of that year, he took little time off work; he continued to hold laboratory meetings and even composed emails from his isolation room. "I had to compartmentalize my illness so that I'd be able to handle what was happening to me on an emotional level. My academic perspective helped me in that regard." But even this consummate scientist reached a point where he preferred to leave the decisions to the doctors and simply slip into the role of the patient. Holländer's experience on the "other side" was fundamental for him, complete with all the pain – and all the possibilities. Aside from sustaining a few infections, Holländer met with little complication during his bout with cancer. Now he describes his health as excellent. And the whole odyssey set off a spark in him: "The recognition that we have to do the work that is asked of us, the work that we think will really have an impact. Because we know we might not always have the chance." ■

Alumni at work: Franziska Bühler

A historian in the age of the data deluge.

Interview: Bettina Volz

Historian Franziska Bühler of the Swiss Federal Statistical Office is responsible for coordinating the exchange of population data between the Swiss residents' registers and Federal Statistical Office. Bühler serves as Section Head of sedex and Register Development, and she and her team play a key role in Switzerland's federal data management.

UNI NOVA: Ms. Bühler, you studied history, philosophy and German philology, and you're now working in a management role at the Federal Statistical Office. How did your career path lead you here?

FRANZISKA BÜHLER: Back in university, if somebody had told me that one day, I'd be a key player in Switzerland's data management system and that I'd feel right at home working in IT, I would have laughed out loud. I was always sure I'd end up in a museum, planning and managing exhibitions, or in an archive, documenting and filing archival materials. Never would I have imagined that 20 years later I'd be in charge of storing all of the data representing the Swiss public in the right place and in compliance with the law and ensuring that the information superhighway is primed to handle the needs of a digitalized Switzerland. But when I look back over the years, the common thread running through my career has been communication.

Franziska Bühler

During and after my studies, I began working in adult education, and that really gave me a chance to familiarize myself with and take advantage of a range of tools and opportunities. Then, when I was on the project staff for a cantonal data platform, I was able to draw upon the experience in data security I'd gathered working at the Basel-Stadt State Archives. Later, I transferred to a federal office where I was working in an area in which data security, data flow, strategy, innovation and politics all came together to be coordinated and communicated across all levels of administration.

UNI NOVA: Describe a day on the job. What do you like most about the work you do?

BÜHLER: We build bridges across administrative levels – between the official Swiss population registers, between eGovernment projects and stakeholders, between the world of statistics and day-to-day business at local government offices. We take the IT data and translate it so it can be understood by everybody – and we try to pass on some of the joy we take in our work, even though we're dealing with serious subjects. I handle an incredible array of topics; our team is made up of software developers, engineers, historians and IT support staff. We organize training sessions in municipalities and cantons, sit on the committees of national and cantonal data management projects and are asked to consult on issues surrounding innovation. We also make sure that our own services are kept up to date with the latest standards for data security and technology.

UNI NOVA: You have a degree in the humanities. What kinds of advantages has that presented in your current line of work?

BÜHLER: It's imbued me with a certain fearlessness, with the daring to explore strange new worlds. To start with a question and set out on a quest for an answer. I conduct research, evaluate sources, explore different points of view, try and weigh all perspectives, and I'm not afraid of foreign languages – in both a literal and a figurative sense. My studies taught me to maintain a broad perspective. As a newcomer to the field, that's all the more important. I don't take a textbook approach to my discipline, so I'm forced to delve deep and explore all kinds of questions and uncertainties. ■

On a personal note

Alumni are part and parcel of the university.

Text: Bettina Volz, Head of AlumniBasel

The goal is to involve graduates more in university activities. This new university strategy is the first to explicitly mention alumni as an integral and valued target group. At universities across Switzerland, alumni are playing an increasingly substantial role in both friendraising and fundraising. The President's Board and the University Council have also come to view alumni as an asset of growing importance to a university. Consequently, for the first time, the University of Basel's Strategy 2022–2030 specifically identifies alumni as a target group in several places throughout the document. Over the past year, this issue was the subject of intensive discussion with the President's Board, and as a result, an initiative was launched to restructure the relationships between AlumniBasel and the university.

Expansion of the alumni strategy

One critical question for the university is how to remain in contact with all of its graduates after they have completed their studies. After all, the success of an academic institution is not based solely on its academic ranking; it also depends on the career opportunities available for its graduates. In the future, the university aims to be in a position to conduct surveys on the current careers of its alumni, even many years after they have graduated.

This means maintaining contact with all new graduates through the alumni organization, even if they are not initially registered as members of AlumniBasel. On an operational level, this would require all graduates to be provided with an alumni email address to be issued free of charge after completing their studies. The Board of AlumniBasel had been considering this issue for several years, but the path was fraught with technical and institutional hurdles. Now, thanks to rapid developments in IT-supported alumni management, that situation has finally changed for the better.

The fruits of digitalization

For AlumniBasel, this meant updating its digital alumni platform and shifting away from its former service provider of the past 15 years. The project will require increased cooperation with the university in order to coordinate a much broader array of alumni-focused activities, which are designed to serve the interests of both the alumni and the University of Basel. The Alumni Strategy 2021–2025, which will reflect these new priorities, is currently being drafted. These measures will be outlined in a service portfolio for existing member groups and expanded to include the target group encompassing new graduates and non-members.

Spring member survey

The future service portfolio will place increased emphasis on gathering and incorporating options and feedback from members. What expectations do you have for an alumni organization? What kinds of activities and offerings do members enjoy? Do the available offerings meet your expectations? Do you have suggestions for improvement? Ultimately, member satisfaction with available offerings governs the success of any alumni organization. The survey will be sent to around 6,000 members of AlumniBasel in Spring 2021. Results and findings from the survey will appear in the fall issue of UNI NOVA. ■

Alumni initiatives

Salz + Kunst.

Alumni Corinna Virchow and Mario Kaiser are already well known for their innovative magazine Avenue, which launched in 2015 and has since successfully established itself on a highly competitive market. But the two publishers are not content to rest on their laurels. Instead, they have channeled their abundant creative energies into a new venture: In December 2020, a brand-new initiative took shape. The two creators were struck by the worsening fallout from the coronavirus crisis, which robbed them of their creative outlets and threatened the existence of their fellow artists. So, they banded together with a software developer, a media specialist and a culture manager, founded an organization and launched the new online platform "Salz + Kunst."

Artists of all stripes can use this website to present work and sell their products to customers. The only requirement is that their works of art must be presented or performed in compliance with pandemic-related public health measures, for example in a garden or on the street. Customers can purchase readings, concerts, plays or paintings for themselves or others to be performed live or via online stream or sent by post. There are products available for every budget, ranging from bedtime stories read for CHF 20 and jazz concerts for CHF 600 to original works of art available for purchase at a price of CHF 10,000. Anyone feeling a need for art in their life will find just what they have been looking for on this innovative platform. ■

salzundkunst.ch

Alumni Annual Meeting

Library renovation.

This year's Annual Meeting of AlumniBasel will be held on 15 June in the newly renovated University Library Basel (UB). For many alumni, this where they actually did their studying: browsing the stacks in the lending section, analyzing texts in the reading room, writing papers and participating in discussions and study groups in the cafeteria. Now the next generations of students study here, and along with them, new types of learning have become part of this venerable establishment. Extensive renovation work has recently been completed, updating the library to handle these changes. New UB Director Dr. Alice Keller and the architects of the renovation plan to provide participants at the Annual Meeting with information on all of the new developments at the library. ■

Startup Ketoswiss

Taking control of migraine headaches.

Elena Gross studied in Basel and earned a doctorate in neurobiology. In 2017, she launched her startup "Ketoswiss," which has already registered two patents in the field of migraine treatment. The Swiss National Startup Team selected Ketoswiss as one of the top ten startups of 2020 among a cohort of 60 applicants. Together with the other selected ventures, the talented young entrepreneur had the opportunity to participate in the Boston roadshow, where she was able to expand her business network and meet investors. ■

keto.swiss

Letter from Cape Town

On being human in Africa.

Divine Fuh
is director of the Institute for Humanities in Africa (HUMA) at the University of Cape Town. He completed his doctorate at the University of Basel from 2005 until 2009 at the Institute of Social Anthropology and Center for African Studies.

I am a social anthropologist and currently the director of HUMA, the Institute for Humanities in Africa at the University of Cape Town in South Africa. I have held this position since January 2020, when I returned from a three-year stint at the Council for the Development of Social Science Research in Africa (Codesria), one of Africa's leading social science research organizations.

HUMA was founded in 2010 to position the humanities as a central hub for critical thinking about the rapid dynamics of South African society. As director, I have made it my mission to build a global institute at this world-class university in Africa, with feminist approaches as part of the organizing principle. We are particularly interested in exploring ethical issues that frame the question of being human in Africa and being African in the world, and that also underpin our ethics toward others. We are a truly diverse institute with a team from across the African continent and around the world.

Some of our current projects include the Future Hospital project and the Knowledge Activism project to strengthen African scientific publishing. The former initiative, Future Hospital and AI, is fascinating because it looks at the ethics of artificial intelligence and imagines the future of care and hospitals. Our knowledge activism initiative addresses the challenges facing Africa's knowledge ecosystem, with the goal of strengthening the publishing infrastructure. Another example is the Feminist Alternatives for (post-) COVID-19 Engagements (FACE) project in Africa. It addresses the attacks on women and feminist expressive spaces as a result of lockdowns.

In Cape Town, I get to experience one of the most beautiful, complex, sophisticated, and cosmopolitan cities in the world. However, South Africa is also a place of contradictions, revolutions and aspirations. I grew up in one of those contradictions, Cameroon. I was born in the heartland of a radical decolonization movement in Batcham, the same place where a brutal massacre of revolutionaries and the community that hosted them occurred in the 1970s. I lived through the protests of the 1980s, the hardships of the economic crisis and structural adjustment and the upheavals of the 1990s triggered by demands for multiparty democracy. Today, this place of my childhood dreams and memories is mired in conflicts caused by a combination of factors. At its core are, among other things, social abandonment, neglect by the state and the government's inability or unwillingness to fulfill the social contract. That my work also focuses in particular on the politics of suffering and smiling is no coincidence. ■

Michael Podvinec is Head of the Research IT Technology Platform at the University of Basel's Biozentrum. Research IT advises and supports university research groups and administrative offices in research-specific IT applications. Michael Podvinec holds a doctorate in molecular biology and is a passionate chef who has been known to frequent Michelin-starred restaurants. He has also collaborated with Chef Heiko Antoniewicz on five books exploring the intersections between science and the culinary arts. Photo: Andreas Zimmermann

Michael Podvinec

Science meets the culinary arts.

"This complexity, combined with the need for precision always has me drawing parallels between the art of making pastry and the science of research in the lab."

It all started out as a reply to a Twitter message from my colleague at the Biozentrum, who was busy enjoying a culinary renaissance following the restaurant closures in late fall 2020. In a series of tweets, I described some of my favorite books from my own collection of cookbooks, the common thread being the connections between science and cooking. I would like to present two of them here:

The first is *Modernist Cuisine: The Art and Science of Cooking,* by Nathan Myhrvold, Chris Young and Maxime Bilet. This compendium, published in 2011, is groundbreaking: Within the span of six volumes and 2,500 pages printed in fine-art quality, the authors dissect and illustrate every modern culinary technique in such scrupulous, scientific detail as to transform recipes into laboratory procedures – all with pristine, didactic clarity and exquisite illustrations and photographs. The authors explore traditional and contemporary cooking methods step by step, generally based on recipes in the modernist, or "molecular" style from the 2000s. So, the book is influenced by a style of cooking somewhat past its prime; still, it provides the reader with a huge amount of background information on the scientific processes involved in preparing food. And it will make a better chef of you – or at the very least, a more-informed one.

The second book is *Desserts* by Julien Duvernay. He is the best pastry chef I know, and he works right here in Basel, on the Bruderholzallee. In the cellar of the restaurant Stucki, Duvernay develops desserts to mirror the menus curated by Michelin-star chef Tanja Grandits, guiding them to their logical conclusions. This book provides readers with insights into the techniques, concepts and, of course, the recipes of this incredibly talented chef. But a word to the wise: If you are planning on recreating any of these recipes yourself, bear in mind that they may take one or two days to complete – and remember that the desserts Duvernay serves at the restaurant are frequently even more complex, combining up to 16 different components on a single plate. This complexity, combined with the need for precision that is both required of and celebrated in the craft, always has me drawing parallels between the art of making pastry and the science of research in the lab. ■

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Sophie Taeuber-Arp

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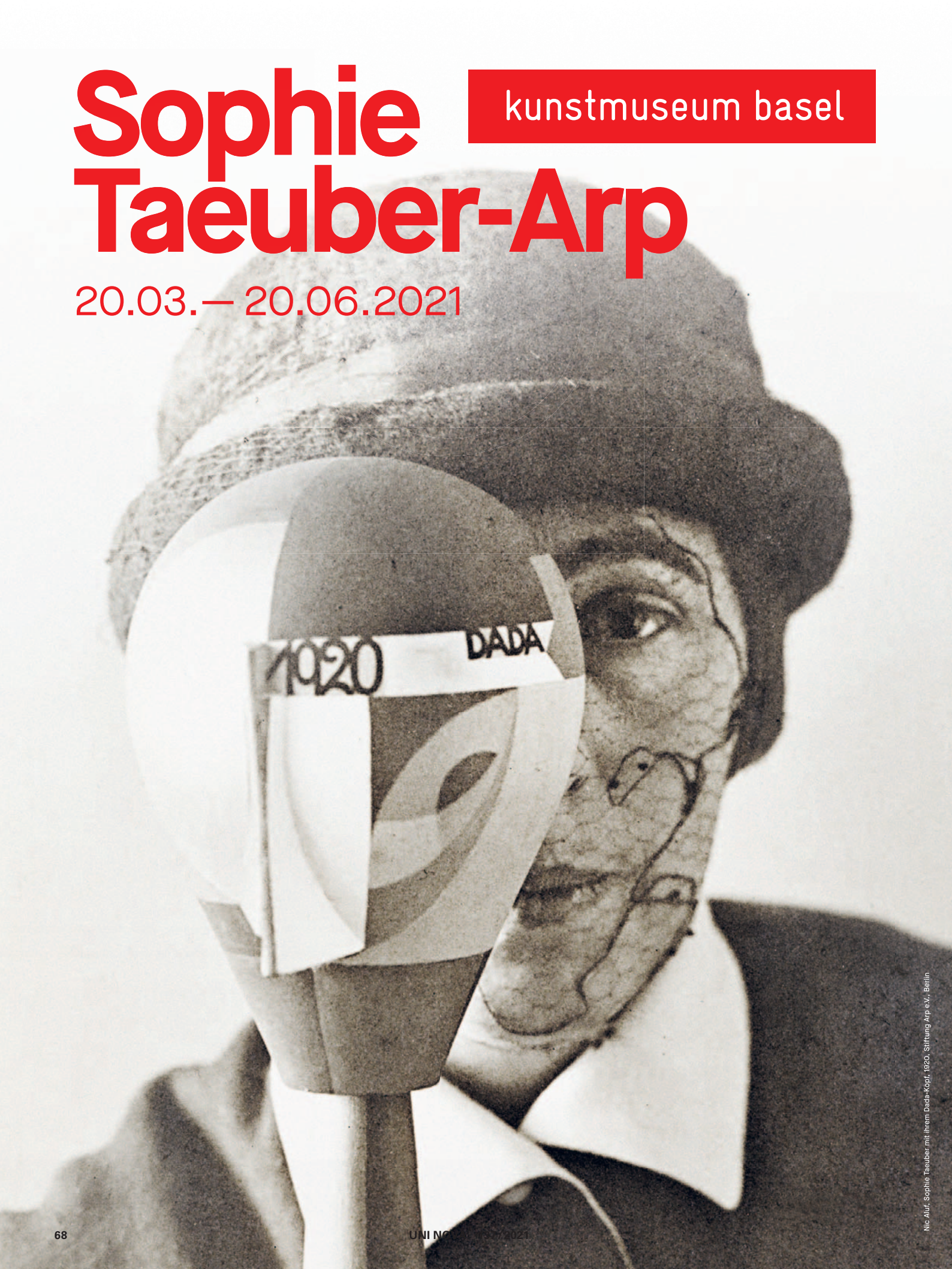

Nic Aluf, Sophie Taeuber mit ihrem Dada-Kopf, 1920, Stiftung Arp e.V., Berlin