University of Basel

UNI NOVA

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Dossier

Advancing age.

In conversation
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1 Reto W. Kressig is considered one of the most sought-after experts in the field of geriatrics in Switzerland. Old age should be seen as both a challenge and an opportunity, writes the Clinical Professor of Geriatrics at the University of Basel and Chief Medical Officer at the University Center for Medicine of Aging at the Felix Platter Hospital in Basel in his contribution to our dossier. Pages 16–17

2 Gabriel Hill has produced the photo series for this issue showing some of the many people who attend Basel's Senior-Uni. This Basel photographer specializes in portrait photography, in particular images of famous people. He works for numerous national and international publications and also for the Zurich Film Festival this year for the very first time. Pages 14–35

3, 4 Philipp Brantner and Florian Thieringer create realistic anatomical 3D models from medical imaging data. The representations help physicians at University Hospital Basel to plan operations, design implants, and explain procedures to their patients. Pages 40–49

Aging as an opportunity.

None of us is getting any younger. Although the life expectancy of the over-65s has risen more slowly, or even fallen slightly, over the last few years, this age group of 1.5 million men and women still makes up almost a fifth of the Swiss population – thanks in part to the achievements of modern medicine. Western societies are becoming disproportionately old, with all of the consequences that this entails. For instance, an ever-smaller number of young people now live alongside an expanding cohort of older people, whose pensions they must work to fund.

Physical complaints, pains and illnesses become more common in old age. Muscles and joints begin to fail, our sight and hearing deteriorate, and even our mind is increasingly at risk. This issue's dossier is devoted to the health and social aspects of aging and presents a selection of current research projects by the University of Basel in areas ranging from medicine, psychology and biology to sports sciences and economics. Aging is a key topic of research, and we are all affected by it.

Exercise and mobility are essential for both the body and the mind. As a psychologist says in this issue, communication is one area in which older people are better at adapting to the needs of others. By paying greater attention to the other person's well-being, they maintain good relationships. Getting older can also be seen as an opportunity to learn new things and develop abilities – to realize what is good for you, for example, and to use your own time sensibly. Indeed, many older people have a more realistic view of life than they did in their youth.

We wish you an interesting read!

Christoph Dieffenbacher
Editorial team, UNI NOVA

Digitalization breaks down great boundaries: Gerhard Lauer in conversation. Page 8

The aging process can be seen as both a challenge and an opportunity, today more than ever before.

Dossier

Advancing age.

Cover photo
Rolf Portmann, one of the many members of SeniorUni Basel, portrayed by Basel photographer Gabriel Hill.

3D printing is rapidly becoming established in medicine with hospitals continually finding new applications, page 40

Imprint

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Pocket astronomical calendar

Instrument of the suns.

Published by the classical scholar Sebastian Münster in 1528, the only surviving copy of this "instrument of the sun" is now in the hands of Basel University Library. It is clear from the condition of the paper that this pocket calendar has been unrolled, used, and rolled up again many times, and even nibbled by mice. Now, paper restorer Lisa Dittmann has painstakingly restored the color print, removing folds and wrinkles and strengthening the edges with Japanese paper where necessary.

Münster, who would later serve as rector of the University of Basel, filled the sheet with around a dozen different instruments. Oriented toward the south, the circular map shows Europe from the Alps to the North Sea. This is surrounded by four round diagrams, including diurnal and nocturnal charts for telling the time by day and by night, as well as other elements providing a wealth of useful information, such as the distance between cities and when Lent starts in different years. ■

bit.ly/uninova-sonne

Innovation

Archaeology goes high tech.

Truvis, a start-up from the University of Basel, has teamed up with the company Bron Elektronik from Allschwil to develop an instrument that can create extremely realistic images of surfaces' materiality. The system has been successfully field-tested near the rock city of Petra in Jordan, where Dr. Peter Fornaro of the Digital Humanities Lab used it to photograph various archaeological finds.

To record an image, the object is placed below a hemispherical light dome, which uses flashes to illuminate it from every angle while a camera takes photographs from above. Then, a computer generates a surface model containing information about color, shape, glossiness and materiality, and can quickly display the object in a wide range of lighting conditions. This reveals chips, signs of wear, fingerprints and other marks that offer clues about an object's origins and how it was produced. ■

truvis.ch

Research Summer

An internship in cutting-edge research.

This summer, around 20 bachelor's students from the natural sciences swapped the beach for the laboratory. The Biozentrum's "Research Summer" gave them the opportunity to gain firsthand experience of working in a research group even at this early stage in their careers.

Those taking part in the internship included Gabriele Pumo, who is studying biology in Basel. Pumo used the example of zebrafish to study the development of existing vessels into blood vessels, which also involved collecting the fertilized zebrafish eggs early each morning. The developing vessels can then be tracked in real time under the microscope. ■

biozentrum.unibas.ch/researchsummer

“The difference between analyzing letters or DNA is smaller than you might think.”

Gerhard Lauer, Professor of Digital Humanities

"Humanities for the 21st century."

Interview: Samuel Schlaefli Photo: Basile Bornand

The humanities of the 21st century will be computer-based, believes Gerhard Lauer, Professor of Digital Humanities. Digitalization is about more than just facilitating access to research material, he explains – it brings completely new analytical methods to the humanities.

UNI NOVA: Mr. Lauer, the digital humanities have been described as a revolution in the field. Is this really an apt description?

GERHARD LAUER: It is indeed. Today, we are able to explore culture in unprecedented breadth and depth. Digitalization has done away with many of the boundaries that have traditionally shaped our field of inquiry. In literary studies, we typically work our way through the canon by reading a small number of books very meticulously. But a person can read up to 4,000 books in their lifetime. Thanks to the digitization of source material, we can now in principle treat an entire century's worth of publications as an object of study. The same goes for collections.

UNI NOVA: As in the case of the British Museum, which is digitizing its entire collection and putting it online?

LAUER: Exactly. Consider, for example, a medieval manuscript by St. Augustine. In order to look at its various parts – which is not even allowed in some cases – researchers used to have to travel to at least Paris, Geneva and St. Petersburg. This is why experts in St. Gallen and Fribourg created the "e-codices" project, a virtual library of manuscripts in which writings located all over the world are digitally pieced together. Now researchers can get to work in a matter of minutes.

UNI NOVA: It's obviously thrilling that so much culture is being made available online. But do people actually look at it? After all, digitalization is also to blame for a surfeit of information and a general attention deficit in society.

LAUER: They do more than just look at it – they study it in great detail. In the "Perseus" project, researchers at Tufts University in Boston have put practically all of the literary works of antiquity online, as they felt this knowledge was relevant to how we think about democracy. The website receives some 350,000 hits a month from all over the world. Ten percent of visitors download the original texts in Greek and Latin. Printed editions never reached that kind of audience. Numerous examples have shown that if you make texts digitally available, readers will come. In this sense, digitalization is expanding our concept of culture.

UNI NOVA: So far, we have spoken mainly about new channels for the dissemination of knowledge. Is this enough to denote a revolution in the humanities?

LAUER: No. Providing a gateway to our cultural heritage is just one part of what the field of digital humanities sets out to do. Another, perhaps even more significant aspect of the revolution is that we can now analyze culture using methods that no longer rely solely on traditional reading, listening or observational skills.

UNI NOVA: You mean machine learning – automated pattern recognition that becomes slightly more efficient and "intelligent" with each pass.

LAUER: Just like the natural sciences, we now solve problems by formalizing and modeling them. An example of such a problem is understanding the plot of a novel. This is not something that a computer can do. But we can simplify the problem by breaking the novel down into 10,000 lexical units. We then look at whether positive words like "happy", "wedding", or "sunshine", or negative ones like "depressed", "dark", or "tired" occur more frequently in each section. This allows us to digitally analyze the plotline and gain an insight into how novels are structured. Computers are unable to read or interpret, but they are good at counting. They can measure the distribution of words, colors or shapes much better than we can.

UNI NOVA: Isn't it a little bit painful for a literary scholar to see world literature being sliced up and "read" by computers?

LAUER: No – this is something that literary science has always done. Literary history classifies texts into different eras or movements, and groups them into genres. What the Brothers Grimm did was no different: they collected and compared fairy tales from all over the world in search of common elements, such as motives. We are doing the same, but with the help of computers.

UNI NOVA: What do research and publication look like in computer-assisted humanities projects?

LAUER: Projects of this sort are for the most part still very labor-intensive. Digitally performing a sentiment analysis to determine which texts Robert Musil wrote during World War I while he was a soldier in charge of a propaganda newspaper in Tyrol took us three years, including two weeks of computation time at a supercomputing center. The project resulted in two publications: one version for humanities scholars and another for the computer science nerds describing all the statistical techniques we used. There is no question that the work we do is changing.

UNI NOVA: A notable feature of your latest publications is that they are mostly team efforts.

LAUER: That's another thing that has changed. I find myself writing fewer and fewer publications alone. There are usually computer scientists or other humanities scholars involved as well. The various disciplines in the digital humanities are heavily reliant on each other – as has been the case in the natural sciences for a long time. The idea that "I am a lone genius and can do everything myself", although still widespread in our field, is a thing of the past. Collaboration and division of labor will be crucial elements of the humanities in the 21st century.

UNI NOVA: Does digitalization devalue conventional skills in the humanities?

LAUER: Yes, and this is why it is encountering such resistance. We have a modernization problem. Imagine you are a renowned theology professor, and you have a PhD student who is using new-fangled computer-based methods to determine which letters where in fact written by St. Paul – a classic problem in theology, as many letters have been "falsely" attributed to him. You probably don't fully understand what your PhD student is doing, but you suddenly realize that their computer-based research could make your own research tradition and skills obsolete. That can be disconcerting.

UNI NOVA: Are there any examples of the digital humanities not just making research more efficient, but actually creating new knowledge?

LAUER: Absolutely. In literary studies, constructivists like Foucault and Barthes have long argued that the author of a text is irrelevant, claiming that authorship is merely a social construct. However, in computer science there are now entire

competitions devoted to authorship attribution – the process of using computer-based methods to attribute texts to a particular author. And the analysis shows that authors do in fact have what we might call a style of their own. So we're actually refuting highly popular constructivist theories.

UNI NOVA: In the past, the humanities and social sciences have had a reputation of viewing digitalization in a critical light, and focusing mainly on its negative effects on society. Are they now being won over by the promise of new opportunities?

LAUER: I would question your premise. What many humanities scholars do – and this is generally as far as their criticism goes – is write articles about how digitalization is destroying our culture and making young people fat and stupid. In the 15 years I have been working in this field, I have seen very little constructive input on the issue from humanities scholars. Who was it that campaigned for open access to ensure equitable distribution of cultural wealth, for instance? Computer scientists. And as for the new methods: in the natural sciences there is a Nobel Prize for them. In the humanities, they are first and foremost an object of criticism.

UNI NOVA: How are the digital humanities affecting teaching?

LAUER: Radically. Our students attend introductory lectures in computer science and learn about statistics. Incidentally, our close collaboration with computer sciences has opened up new potential for that field as well: a significant number of women, who are otherwise underrepresented in computer science, are drawn to the combination of culture and computer-assisted methods.

UNI NOVA: How well-established are the digital humanities in Switzerland?

LAUER: ETH Lausanne and the University of Lausanne are leading the way. The latter was the first university in Switzerland to offer a degree program in digital humanities. Geneva is currently advertising a vacancy for a professor in the field, and the University of Bern has been looking for one for some time. Digital humanities are a hot topic at a growing number of universities.

UNI NOVA: What is the situation like in the English-speaking world?

LAUER: The best place to do research in digital humanities right now is Nebraska.

UNI NOVA: Nebraska? Not Stanford, MIT or Harvard?

LAUER: No. Several high-caliber humanities scholars left Stanford University to establish a Center for Digital Research in the Humanities at the University of Nebraska, because there they had the freedom to do things they weren't allowed to before. Even though Stanford is at the heart of Silicon Valley and has a techy reputation, the historians and literary scholars there still have a very traditional understanding of their field. This is why the canon of U.S. literature is being explored first and foremost in Nebraska. Innovation often comes from the periphery, not the center – Max Weber was right about that.

UNI NOVA: Before you came to Basel, you tried to establish the digital humanities at the University of Göttingen, but came up against resistance from the faculty. Aren't you worried that something similar might happen in Basel?

LAUER: No, in Basel the field's potential is acknowledged not just by the University president but also by the dean's office directly responsible for our lab. Despite the very modest means at our disposal, the signs are encouraging. For example, work is underway on a Data Analytic Center where humanities scholars, sociologists, biologists and chemists will work together, as the computer-assisted methods employed by these disciplines often have a lot in common. The difference between analyzing letters or DNA is smaller than you might think.

UNI NOVA: How much interest have your colleagues at the University of Basel shown in the digital humanities?

LAUER: More than we can cater for with our modest resources. We are currently listed as a partner in ten applications for funding under the Swiss National Science Foundation's Digital Lives scheme – besides five applications of our own.

UNI NOVA: What is your long-term vision for the Digital Humanities Lab in Basel?

LAUER: I hope to carry out computer-assisted analysis and humanities research, ideally in combination with experimental models such as eye tracking. My aspiration is to enable a humanities for the 21st century, at least for certain research issues. Although it is by no means a must for every discipline, I am convinced that this is the way forward for a growing subset of the humanities.

UNI NOVA: Does that mean that in future, humanities scholars will spend more time sitting at their computers wrestling with probabilities and codes?

LAUER: Of course we are still something of an oddity at this stage – we're the nerds with eccentric formal ideas. But if things go well, the digital humanities will eventually be incorporated into the various subjects in much the same way as is happening with bioinformatics at the moment. At some point, it will be perfectly natural for a student of art history or German studies to be proficient in computing and statistical models. ■

Gerhard Lauer
has been Professor of Digital Humanities at the University of Basel and head of the Digital Humanities Lab since 2017. He studied German language and literature, philosophy, musicology and Jewish studies at Saarbrücken, Tübingen and Munich. In 2002, he was appointed to the chair of German philology at the University of Göttingen, where he began establishing the Centre for Digital Humanities in 2010.

Pediatrics, Uni Talks, and promoting innovation.

Uni Talks

Focusing on the Canton of Baselland.

At seasonal markets this fall, the University of Basel will present a selection of research projects with direct links to the region. There will also be panel debates in Liestal, Laufen and Sissach, providing experts from the university and the region with an opportunity to engage in discussions with the audience.

The tour draws to a close in Sissach, where researchers will be at the fall market to present their projects from 9 am to 6:30 pm on November 14. Following that, the influence of climate change on Swiss forests will be the subject of a Uni Talks event at the "Obere Fabrik" business and cultural center in Sissach on November 15. At the event, plant scientist Ansgar Kahmen and Ueli Meier, director of the Basel forestry office, will look back at the recent hot summer and explain the impact of drought on indigenous trees. ■

unibas.ch/uni-talk

Life Sciences

Research center for pediatric medicine.

"We want to have an impact on the lives of children and adolescents": Dr. Peter Lenz, President of the Board, Fondation Botnar, Professor Andrea Schenker-Wicki, President of the University of Basel, and Professor Lino Guzzella, President of ETH Zurich, at the founding of the BRCCH.

brcch.org

The new Botnar Research Centre for Child Health (BRCCH) is opening in Basel with a view to promoting the health of children and adolescents. Founded by the University of Basel and ETH Zurich, the new center will begin its operational activities at the start of 2019 and is funded by a CHF 100 million contribution from Fondation Botnar in Basel.

The research center is intended to help prevent diseases, develop new treatment approaches, and improve diagnoses and effectiveness forecasts in children. Its work will focus on diabetes, infectious diseases, immunology, and cardiorespiratory diseases, as well as the restoration of bodily functions through regenerative surgery.

Ultimately, the aim is for the center to become a leading institution for cutting-edge, application-oriented research in the field of pediatrics. Basel provides an ideal environment for the new research center thanks to its numerous research institutions, hospitals, and innovative companies in the areas of biotech and life sciences. ■

Promoting innovation

Coaching scheme for spin-offs.

As part of its innovation initiative, the University of Basel wants to boost the number and quality of spin-off companies and is therefore expanding the advice service provided to fledgling companies in cooperation with the School of Life Sciences at the University of Applied Sciences Northwestern Switzerland (FHNW). To this end, the two universities have agreed a new partnership with Erfindungs-Verwertung AG (EVA).

Since 2009, EVA has been operating the "Basel Incubator" start-up center in Stücki Park, providing support to spin-offs from the universities. It now plans to assist the young start-ups with strategic and operational coaching before and after they are founded, and regardless of where they are based. ■

Self-governance

University sets up ethics committee.

The university's ethics committee will be tasked with supporting members of the University of Basel in fulfilling their ethical responsibilities. This is particularly prudent for research projects that collect sensitive personal data or those that involve minors or people lacking mental capacity, for example. The ethics committee will review all ethically relevant research projects at the University of Basel that do not fall within the remit of the cantonal ethics committee. It will also advise the President's Board on controversial ethical issues and represent the university publicly in regard to any ethical matters. ■

Beatrice Gardini from Rheinfelden, born in 1949, attends lectures at the SeniorUni on psychology and the digital future.

Advancing age.

Photos: Gabriel Hill

Problems associated with aging populations will certainly affect Western societies in the future. Our dossier focuses on muscular atrophy, dwindling hormones and labor markets – but also on the new possibilities and opportunities that come with older age.

Page 20
The risk of developing a form of dementia such as Alzheimer's disease at some stage can be assessed by analyzing the way a person walks – a visit to the gait lab.

Page 24
Normally, intellectual abilities decline with age. In one area, however, our seniors have a clear advantage: they simply have more knowledge.

Page 34
Older people are being motivated to move more by taking exercise together with their grandchildren – outside at a play area in the park.

The challenge of old age.

We are not only getting older, but also increasingly doing so in good health. Aging can therefore be seen as both an opportunity and a challenge.

Text: Reto W. Kressig

The saying "Getting old isn't for the faint of heart" is attributed to the American movie star Mae West, who lived to the ripe old age of 87. That is not to say that youth and adulthood are without their challenges. Nevertheless, many see seniority as an overpowering adversary that, for lack of courage, they want to avoid confronting for as long as possible.

Whether the fear of aging that exists for many is rooted in cultural, social or religious issues, or is primarily about coming to terms with their own mortality is probably something that everyone has to work out for themselves. Likewise, it should be for everyone to decide whether they want to change where and how they live at a certain age. After all, in many cultures – unlike in ours – old age is held in particularly high esteem. In some, such as Judaism, old age is even considered an almost ideal life situation. In Japan, Respect for the Aged Day has been an official annual holiday since 1966. In the dichotomy between these cultural disparities, people can experience old age – on a philosophical and psychological level – either as an opportunity or as a deficiency.

Improved health

On average, those aged 80 in Switzerland today are in significantly better health from a biological/medical perspective than people of the same age 20 years ago. Among those born in 1950, 5.3% of men and 9.5% of women are expected to live to the age of 100. Of the generation born in 2013, 17.6% of men and 23.9% of women will probably live to see their 100th birthday. Today, it is assumed that this longevity – which many enjoy in good health – is the result of a healthy lifestyle with a balanced diet, regular physical and mental activity, and consistent monitoring of vascular risk factors.

Indeed, research into healthy aging in particular is currently experiencing a golden age. With over 2,100 participants, the recently completed multicenter "DO-HEALTH" study of healthy aging was the largest EU-funded study of the topic to date. The data analysis work is currently running at full steam with a view to revealing the extent to which a simple exercise program and the intake of vitamin D and omega-3 fatty acids can affect the health of seniors over the age of 70 who live in their own home.

A protein-rich diet in old age has already been shown to help preserve muscle mass and strength – which is a very promising finding in terms of mobility in old age but not that easy to implement in everyday life. Finally, there is also scientific evidence that gait steadiness and cognitive fitness benefit significantly

"Indeed, research into healthy aging in particular is currently experiencing a golden age."

Reto W. Kressig

from activities such as eurhythmics, dance, or tai chi: a study of participants with an average age of 75 found that such activities reduce fall risk by about half and boost cognitive-motor multitasking ability.

Advances in geriatric medicine

The debate rightly continues as to whether our healthcare system adequately meets the medical needs of older patients with acute illnesses that require hospitalization. Here, it is typically up to family doctors to decide whether an older patient's acute illness can be treated using classical internal medicine or requires hospitalization in a specialist acute geriatric ward.

Acute geriatric medicine developed from general internal medicine with the addition of specialist training in geriatrics. It has undergone considerable development in recent years and, in the Swiss healthcare system, can provide intensive physiotherapy and early rehabilitation services at the same time as acute treatment. This maximizes functional independence in older patients at risk of functional decline due to acute illness. Course content relating to geriatric medicine has now been included in the university catalog of learning objectives for medical degrees in Switzerland for over ten years and is taught at all universities here.

It is particularly interesting to note that a growing number of young and prospective physicians see themselves specializing in geriatric medicine – and the curve has been rising exponentially for years. In Switzerland, we have now reached a degree of geriatric specialist healthcare coverage that is higher than in the USA. Faced with demographic change, we can only hope that this trend persists.

Complex research

Modern aging research incorporates countless facets, which reflect the manifold dimensions of later life. Aging is considered from the perspectives of biology, medicine, law, philosophy, ethics, social science, economics, political science, and cultural studies. In light of ongoing demographic changes, these research activities will continue to experience considerable growth.

Medical clinical research on older patients, who are often suffering from multiple illnesses and functional impairments, is extremely complex. This is reflected in, for example, the continuing systematic exclusion of such patients from drug trials. Potential complications are considered too difficult to interpret as well as too fraught with risks and consequences. Nevertheless, once authorized, the same drugs are then also used in the excluded patient groups.

The heterogeneous state of health of many older people makes it hard to find reliable, clinically practicable answers to important questions in clinical research. Modern research into geriatric medicine therefore increasingly resorts to a "frailty" classification in order to homogenize older study populations. This classifies older people, regardless of the number of diagnoses, based on their degree of frailty and existing functional reserves (also referred to as stress resistance). The degree of frailty is based on various health dimensions and allows classification into "fit", "transitional" or "frail". The advantage of a study design with a defined degree of frailty is clear: the study's results can then be implemented much more easily and reliably in the clinical setting.

In this way, the aging society is driving progress in teaching and research in the field of geriatric medicine – which in turn benefits older people. They are not only living longer, but also increasingly doing so in good health. This should provide comfort for the faint-hearted individuals in the quote from Mae West. After all, there is no escaping the fact that aging is the only way to live longer. ■

Reto W. Kressig
is Clinical Professor of Geriatrics at the University of Basel and Chief Medical Officer at the University Center for Medicine of Aging at the Felix Platter Hospital in Basel. After studying medicine at the University of Zurich, he went on to complete a doctorate and qualified as a specialist in internal medicine and geriatrics. Kressig is committed to the provision of coordinated and joined-up medical care for the older population.

SeniorUni Basel

Afternoons in the auditorium.

Text: Christoph Dieffenbacher

Memories and loss of them, cancer, healthcare costs, and placebo effects: Many of the lectures in the current program of SeniorUni Basel cater directly to the target group. The series offers insights into the topics of research and exploration at the University of Basel, mostly in psychology, history, art and cultural history, theology, and philosophy. The SeniorUni Basel is open to anyone aged 58 and older, or retirees and their partners. Lectures are usually held in the afternoon by faculty members of the university in the Kollegienhaus auditorium.

For almost 40 years, the SeniorUni has been held jointly by the University of Basel and the community college *Volkshochschule beider Basel.* Then rector and chemistry professor Christoph Tamm launched the project in September of 1979, when university programs for senior citizens began to spread throughout Europe. Today, about 1,250 men and women register in Basel every year. Each lecture is held twice to accommodate the huge demand. The audience appreciates this opportunity to stay informed about current research issues. Many participants also use the SeniorUni as an opportunity to socialize with friends, acquaintances, and participants with similar interests on a regular basis. See the portraits of some SeniorUni Basel participants in the photo series illustrating the theme of this issue. ■

vhsbb.ch/seniorenuni

Richard Schnider from Basel, born in 1946, attends lectures at the SeniorUni on history, philosophy, religion, psychology and music.

Progress in the gait lab.

Discrete irregularities in gait can point to cognitive deficits later in life – even years in advance. The University Center for Medicine of Aging at the Felix Platter Hospital in Basel is involved in cutting-edge research in this area.

Text: Christoph Dieffenbacher

Stephanie A. Bridenbaugh is head of the gait lab at the Basel Mobility Center, affiliated to the Felix Platter Hospital in Basel and the clinical chair of geriatrics at the University of Basel.

There's more to this walkway than meets the eye. Looking at the ten-meter strip of plastic, you wouldn't think that some 30,000 tiny sensors were stuck to the bottom. The walkway, which is used to objectively measure gait at the Basel Mobility Center, is housed in a former dining hall on the grounds of the Felix Platter Hospital. When someone walks across it, the imbedded pressure sensors can measure up to 80 different parameters – from the walking speed to the length and width of the strides and even tiny irregularities that are undetectable with the naked eye.

Life-threatening falls

Over the last eleven years, more than 6,000 gait analyses have been performed using this GAITRite walkway. The data comes mainly from older individuals who were referred by their family doctor and who find walking increasingly difficult. Whether it be due to dizziness, memory problems, lack of muscle mass or joint pain, something they used to take for granted becomes a serious problem: unsteady gait in old age can lead to life-threatening falls.

Usually, patients have to complete five or six lengths of the carpet walkway. Sometimes, they are asked to walk faster or slower than normal; sometimes, they must walk while simultaneously performing a second task, such as counting backwards or naming different animals. These "dual task" tests place an additional burden on the brain – that is, the subjects have to complete an additional cognitive task while they walk. This is one of the research specialties of the gait lab at the Basel Mobility Center, which is affiliated to the Felix Platter Hospital and the Department of Clinical Geriatrics at the University of Basel. "When people are burdened with an additional task while walking, their speed generally slows by a tenth," says Dr. Stephanie A. Bridenbaugh, who is head of the lab. "They also walk with a more irregular gait and often with a slightly wider stride."

What is the norm?

In addition to diagnosis and early detection, the doctor spends half of her time on research, which she conducts in collaboration with colleagues in Switzerland and abroad. She explains that unsteady gait can often be a symptom of underlying problems. Her current research seeks to determine what actually constitutes a normal gait in old age. In terms of speed, for example, the norm for adults is at least 100 centimeters per second, but she says that many aspects remain unclear. For example, what is the normal walking speed of an 80-year-old woman?

For Bridenbaugh, geriatrics is "one of the most exciting areas" of medicine, because it spans multiple disciplines: "Here, there's no such thing as a textbook case." She cites the problems her older patients experience in everyday life: While out in public, they

are confronted with dozens of different stimuli – on crosswalks, on escalators or on the tram. Without realizing it, older people often automatically stop walking in these situations and are then pushed from behind, barged into or bombarded with insults. "It'd be nice if more people put themselves in older people's shoes," the doctor says.

Detecting dementia in advance

Not uncommonly, the cause of certain gait disorders can be found in the brain, and specifically in the area responsible for sensory and cognitive functions, says Bridenbaugh: "Researchers in the US have shown that cognitive deficits can be predicted based on walking speed up to ten years in advance." Gait analysis can even be used to estimate the risk of eventually developing some form of dementia, such as Alzheimer's disease.

Researchers in Basel are also collecting data and carrying out studies in this area. For example, they are investigating whether it is possible to predict the type of dementia a person will develop later in life based on gait disorders. They are also studying the influence of diet and muscular atrophy on gait. In addition, studies have found that ginkgo preparations can help people with mild cognitive impairment improve their gait, as the plant extract improves blood circulation in the brain. Another finding to emerge from Basel is that older people who still have their own teeth are steadier on their feet than people with missing teeth or dentures.

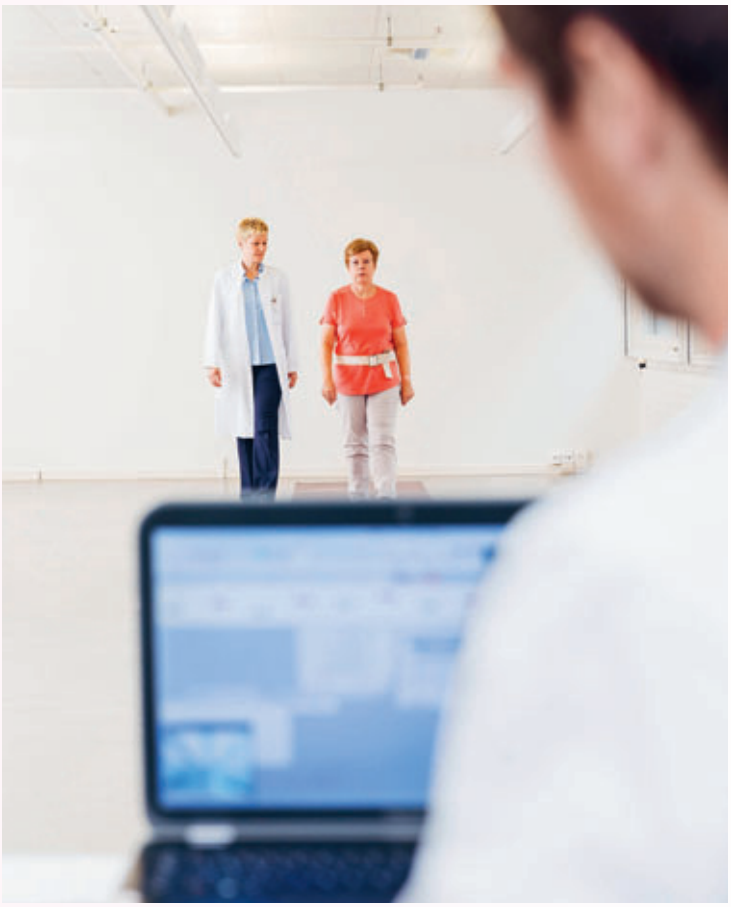
Meditation and mobility

"Sometimes, the gait measurements lead us to new, previously unknown findings," says the doctor. Her goal is to help patients improve their gait using simple methods. In this regard, research and clinical practice can benefit from one another: The latest findings and advances in geriatric medicine can be implemented directly. For example, a study is currently underway into the relationship between Eastern forms of movement and mobility in old age.

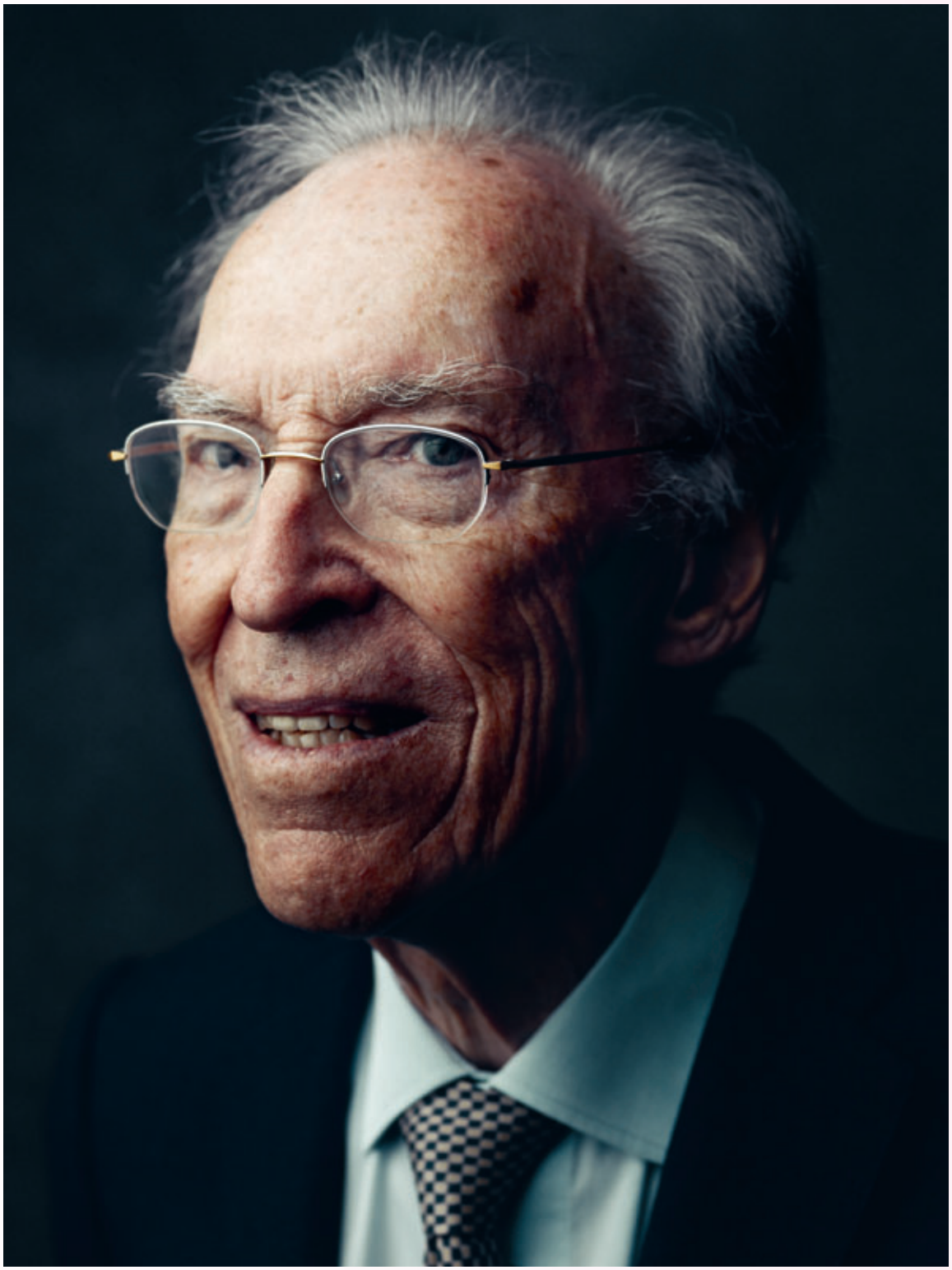
In operation all week long, the gait lab in Basel is used to its full capacity. Indeed, Bridenbaugh is already looking forward to the relocation to a new building next year, where there are plans for two gait labs so that researchers can take even more extensive measurements. Using small, wearable sensors, it is possible to measure other parameters such as upper body sway or stepping height, for example. Bridenbaugh hopes to continue gathering important insights to create a comprehensive picture of gait that can be presented in the form of objective figures, and compared with other values.

Twice as many over-70s by 2040

The American-born doctor's remarks point to a future that is dominated by aging research and preventive healthcare: "If the number of over-70s actually doubles by 2040, we will face real challenges as a society." That includes challenges at the economic level, says Bridenbaugh: "If we manage to delay placement of older people into a retirement or nursing home by just one year, we could save millions or even billions of francs." ■



The latest research findings in geriatric medicine can be applied directly here: doctor and patient at the Basel Mobility Center gait lab.



Rolf C. Portmann from Liestal, born in 1929, attends lectures at the SeniorUni on history, medicine and theology.

Old age underestimated.

Psychologist Jana Nikitin investigates how people approach and avoid each other. Older people are better at adapting to the needs of people around them.

Interview: Iris Mickein

Jana Nikitin has spent 15 years studying the ways in which people establish and maintain relationships. She recently concluded a number of studies on social approach and avoidance motivation across the life span, with an emphasis on old age.

UNI NOVA: Professor Nikitin, biologically speaking, aging is a degenerative process. What's your perspective on that?

JANA NIKITIN: There's no denying that old age has its limitations. And yet, people today are leading ever longer, healthier lives. Psychologists believe that development occurs at all stages of life, only in different functional areas. Each stage is associated with specific gains as well as losses. In old age, emotional intelligence is one area that stands to benefit. Crystallized intelligence, which is linked to factual knowledge, may continue to increase, too. By contrast, fluid intelligence, which manifests itself in problem solving processes, is more likely to decline. However, recent research has shown that even this kind of intelligence can be improved in old age with the help of specific techniques.

UNI NOVA: Still, older people are often portrayed as being lonely.

NIKITIN: That's a negative stereotype. It's true that older adults maintain fewer social contacts than younger or middle-aged people. But the motivation behind this tendency is anything but negative: Older people report a relatively high degree of satisfaction with their social relationships, whether with their partner, family members or friends. This sets them apart from younger people, who tend to be less happy with their social contacts. As people age, their resources change and, as a result, so do the goals they pursue in their relationships. Older people set greater store by their social ties. Their primary motivation is to avoid negative social interactions such as conflicts. And as a rule, they're better at doing so than younger people, because they care more about the wellbeing of those around them.

UNI NOVA: Does this mean that older people are more empathetic?

NIKITIN: Not necessarily. Empathy involves perspective-taking – a cognitive process older adults have more difficulty with. As psychologists, we prefer the term "responsiveness," which means the ability to adapt to the needs of somebody you're dealing with even if you don't understand how they feel. This helps cement relationships: Even in difficult situations, older people feel close to the person they're interacting with, because they care more about that person's well-being.

UNI NOVA: How do you measure the interest they take in the other person's well-being?

NIKITIN: I use specific statements made by study participants. In addition, responsiveness can be gaged indirectly through speech analysis: For instance, older people will use words like "we" and "our" more often, regardless of whether they're aiming for social approach or avoidance in a given situation, in other words, whether they're trying to achieve something positive or avoid something negative. This kind of behavior shows an orientation towards their interlocutor which young people in difficult situations would abandon in favor of a more self-centered perspective.

UNI NOVA: How would you define successful aging?

NIKITIN: Successful aging is a creative process that needs to be actively managed. It means redefining your goals so that they're appropriate to the resources you have available – which also means abandoning goals that are impossible to achieve. ■

Jana Nikitin is Assistant Professor of Personality and Developmental Psychology at the University of Basel's Faculty of Psychology. She considers social approach and avoidance motives to play a key role in human relations.

With age comes knowledge.

We learn new facts and concepts well into old age. Psychologists at Basel University are investigating how, over the course of our lives, our memory adapts to this expansion in knowledge.

Text: Yvonne Vahlensieck

It is a well-known phenomenon that our mental faculties steadily deteriorate as we grow older. Older people tend to forget names, have poor short-term memory, and generally take longer to do things. "When we're talking about old age, we're usually talking about some change for the worse," confirms Rui Mata, a psychologist who heads the University of Basel's Center for Cognitive and Decision Sciences. However, there is one respect where seniors have the edge: They have more accumulated knowledge at their disposal. "That's the only area where being older is actually an advantage," he says.

This is evidenced by a simple experiment that involves naming as many kinds of animal as possible in a minute. On average, those aged over 65 can name three animals fewer than younger-generation participants. "However, older people will more often name less obvious animals such as a rare species of parrot or a particular breed of dog," says Mata. "This means that while we all keep accumulating unique knowledge throughout life, young people differ very little from one another in terms of what they know." Older people are at an advantage, which manifests itself, for instance, in that they have a larger vocabulary and are more likely to be familiar with uncommon words.

Mental knowledge database

This mental repository of acquired knowledge is known as semantic memory. It contains all the facts and concepts that we learn in our lives, be they words, types of animal, historical facts or cultural knowledge. Although this type of memory has long been known to exist, it is only in recent years that technological advances have enabled researchers to investigate its structure in any detail. For instance, Mata and his team used computer models and statistical methods to analyze the order in which participants name animals. "People will typically start with domestic animals such as dog and cat. Once they find that they can't think of anything new in that category, they'll jump to the next one, say jungle animals such as crocodile and snake," says Mata.

Findings like these led Mata and his fellow psychologists to conclude that facts are not stored randomly in our semantic memory. Based on shared characteristics, they will instead group around specific nodes, which are known as hubs. For example, there are hubs for domestic animals, furry animals, tools, kinds of fruit, and an infinite number of other categories.

This form of organization allows us to retrieve information quickly: When we are trying to think of the name of an animal seen in a photograph, we do not have to search our entire memory. Instead, we call up an appropriate hub (e.g. "winged animals"), which then allows us to find the name (say "goose") more quickly. This organizing principle, also known as small-world structure, is found in a wide variety of areas, from the interconnections in social networks to a fruit fly's nervous system to airline route networks. "Ultimately, semantic memory isn't simply a measure of how much a person knows, it also depends on knowledge being stored in a structured way," Mata explains.

Comparing old and young

Mata, who specializes in the psychological aspects of aging, is interested particularly in how these structures change as we grow older and gather more knowledge. The question of whether older people's semantic memory is organized differently from young people's is being addressed by a new large-scale word association study. It compares people from different age groups with one another and involves participants spontaneously naming all the things they associate with a particular word.

Based on thousands of such associations, Mata then plans to individually map each participant's semantic memory. The resulting three-dimensional map will pinpoint how closely specific words and con-

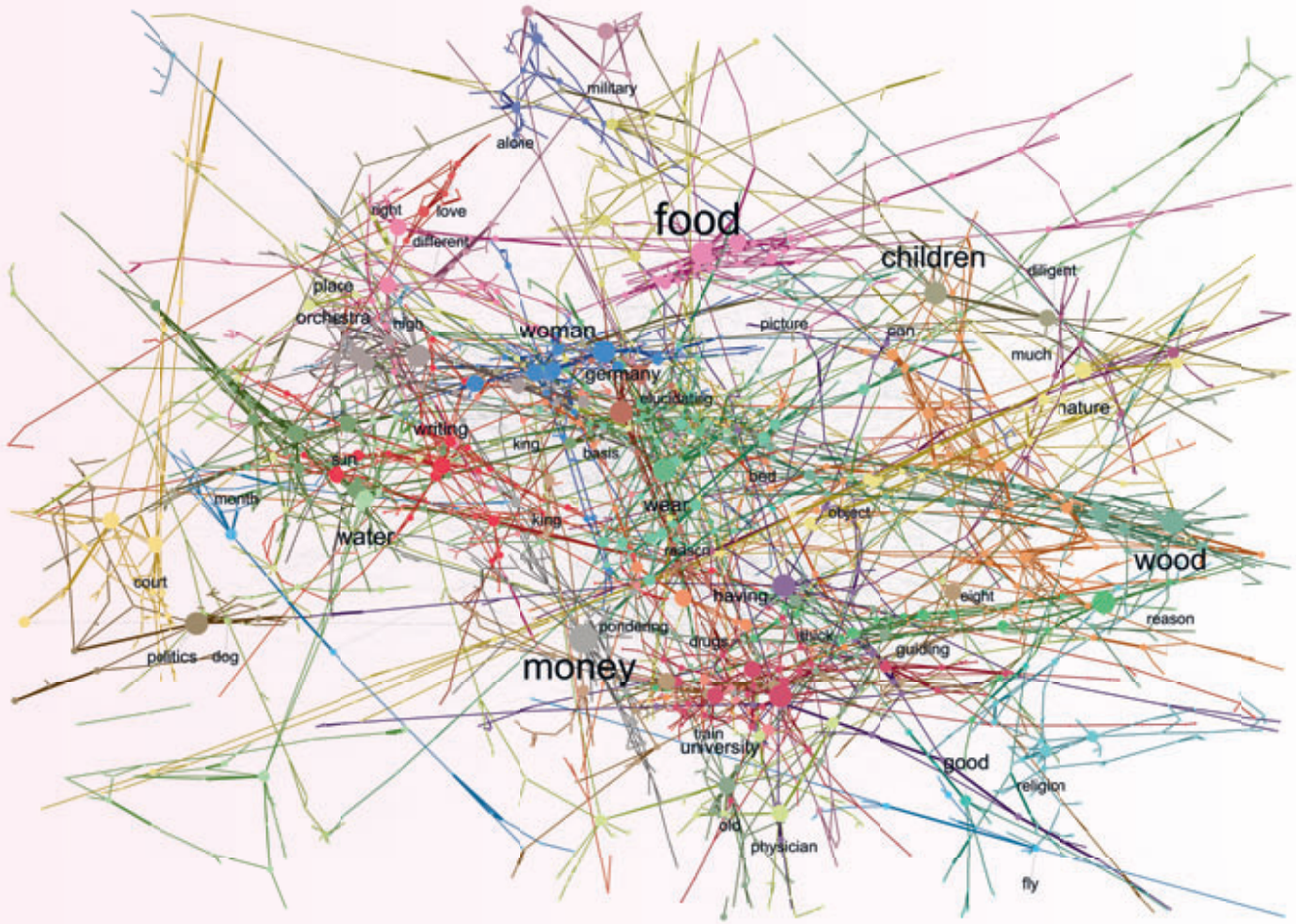
cepts are linked and which hubs they group around. Mata expects to find greater variation among older than among younger people on account of differing amounts of individually accumulated knowledge.

In the future, results from this study and others like it could help refine diagnostic tests for degenerative brain diseases. When checking for signs of these, physicians usually test other types of memory such as episodic memory, where personal events are recorded, or short-term memory, with little attention given to semantic memory. Although it is known that Alzheimer's patients tend to retain factual knowledge for longer than they do personal memories, there are special forms of dementia that mainly affect a patient's semantic memory, making it very difficult for them to come up with the correct names for animals, tools or fruits, for instance.

"Like a library"

Psychologists have begun to suspect that the ever-growing encyclopedias in our heads may also have their downside. Mata speculates that an excess of knowledge is one of the reasons why certain cognitive skills deteriorate in old age: "It's like a library: The more books there are, the longer it takes to find a particular one." This might explain why older people sometimes have to rack their brains for a name or calendar date they know.

Mata and his team of researchers are currently devising experiments to test this relatively new hypothesis. While many questions have yet to be answered, one fact remains: Older people have more knowledge than the younger generation – even if it can take a little longer to access. ■



Semantic memory
An individual's semantic memory map. This includes all the knowledge one person has about the world and is organized along networks. It is assumed that the meanings of words, concepts and their interconnections saved in a person's memory continue to evolve throughout life.

Elisabeth Wolf from Dittingen, born in 1948, attends lectures at the SeniorUni on history and medicine.

Older women and hormones.

When it comes to women's health, geriatric medicine has been focusing on reproductive organs and hormonal aspects for decades. Yet healthy aging is first and foremost a mental and psychological process, according to Professor of Gynecology Johannes Bitzer, former chief physician at the Women's Health Clinic, University Hospital Basel.

Text: Irène Dietschi

Back in 1963, everything seemed so simple. In the USA, the bestselling book *Feminine Forever* by gynecologist Robert A. Wilson encouraged all women entering menopause to "take hormones!" Wilson defined the female body as "deficient" when its ovaries stop producing hormones. Something was lacking – so supply had to be restored. "Hormone replacement therapy" was born and with it, the prospect of a fulfilled sex life without an expiration date. Millions of older women bought the book, ascertained a "deficit" in their reproductive organs, and started taking hormones.

Now, 55 years later, the situation is a little more complicated. The mere question of when a woman starts "aging" is already contentious. "It's not clearly defined these days," says Professor Johannes Bitzer, Professor emeritus of Gynecology and Obstetrics and former chief physician at the Women's Health Clinic at University Hospital Basel. Bitzer has been working in the fields of psychosomatics and sexual medicine for many years. Since his formal retirement, he has been working in a group gynecological practice.

Johannes Bitzer is Professor emeritus of Gynecology and Obstetrics at the University of Basel and former chief physician at the Women's Health Clinic, University Hospital Basel.

Dwindling levels of estrogen

"According to geriatric medicine, the older phase of life starts at about 60," says Bitzer. Yet in women, changes commence much sooner than that – at an average age of 52, when menopause begins. "Menopause marks the beginning of a phase when hormone-related conditions increase," Bitzer explains. Most of these are cardiac and circulatory issues: The body stops producing estrogen, which protects the blood vessels from arteriosclerosis during the fertile years. Other hormonal changes are a loss of bone density, which can cause osteoporosis, and the "urogenital syndrome" – vaginal dryness, weakened bladder control, and frequent urinary tract infections. "These are the typical symptoms that cause many older women to seek our help," says Bitzer.

In addition to hormonal symptoms, there are other conditions that are unrelated to hormones and affect women and men alike. These include most cancers, as well as – once again – arteriosclerosis. According to Bitzer, cardiac and circulatory conditions are the leading causes of death for both genders.

So what is the current status of this "hormone replacement therapy" that Robert Wilson used to promote so ardently? Perhaps the major change compared with the 1960s is this: "Today, we just call it hormone therapy," says Bitzer. They dropped the word "replacement", which implies a possible deficit in the female body. In modern women's health, the fact that ovaries stop producing hormones at some point is considered a natural condition. Period. And:

"For women, taking hormones to ease age-related ailments is one option – but not the decisive one."

Drama about a study

Then, there was the drama about a study by the Women's Health Initiative, short WHI, whose ripple effects are still felt today. This large-scale study with a price tag of 625 million US dollars and 160,000 participating test subjects was launched in the USA in 1991, yet it involved women from around the world, also in Basel. Bitzer has mixed feelings when he recalls this time in the early 2000s when hormones were suddenly considered the work of the devil.

"At University Hospital Basel, we never thought that hormones should be mixed in with the drinking water, so to speak," Bitzer says. "We only prescribed them to patients with clear symptoms, and we took risk factors into account. Yet when the initial results of the WHI study became public, the pendulum swung all the way in the opposite direction: The women became scared; they categorically rejected hormone therapy – even those who would have clearly benefited from it."

What happened? Let's go back a little: It is known that hormones help ease menopausal issues such as hot flashes, sweats, or the urogenital syndrome. Yet the WHI study did not focus on these therapeutic effects. Rather, the initiators from the National Institute of Health wanted to explore whether hormones help protect from cardiovascular risks. "WHI saw hormone therapy as a preventative measure: They hoped to show that it can prevent cardiac deaths in geriatric patients," Bitzer explains.

A hidden flaw

The opposite occurred: Cardiac deaths increased in the WHI study. Making matters worse, taking hormones seemed to also increase the risk of breast cancer. More heart attacks, a threat to breast health – of course, women with menopausal symptoms did not want anything to do with this kind of "therapy" any more. What was completely lost in the barrage of alarming news: The initial results contained a major flaw caused by the design of the study. The error: Most test subjects were not *in* menopause, but considerably older, 63 years old on average.

"Some of these women may have already been suffering from arteriosclerosis," Bitzer explains, "and for these test subjects, the study unfortunately showed a negative effect of hormones: In the bloodstream, hormones encourage blood platelets to attach to plaque." As a result, blood clots increase, obstructed sections become even narrower. Depending on the affected area, this can lead to a heart attack or stroke.

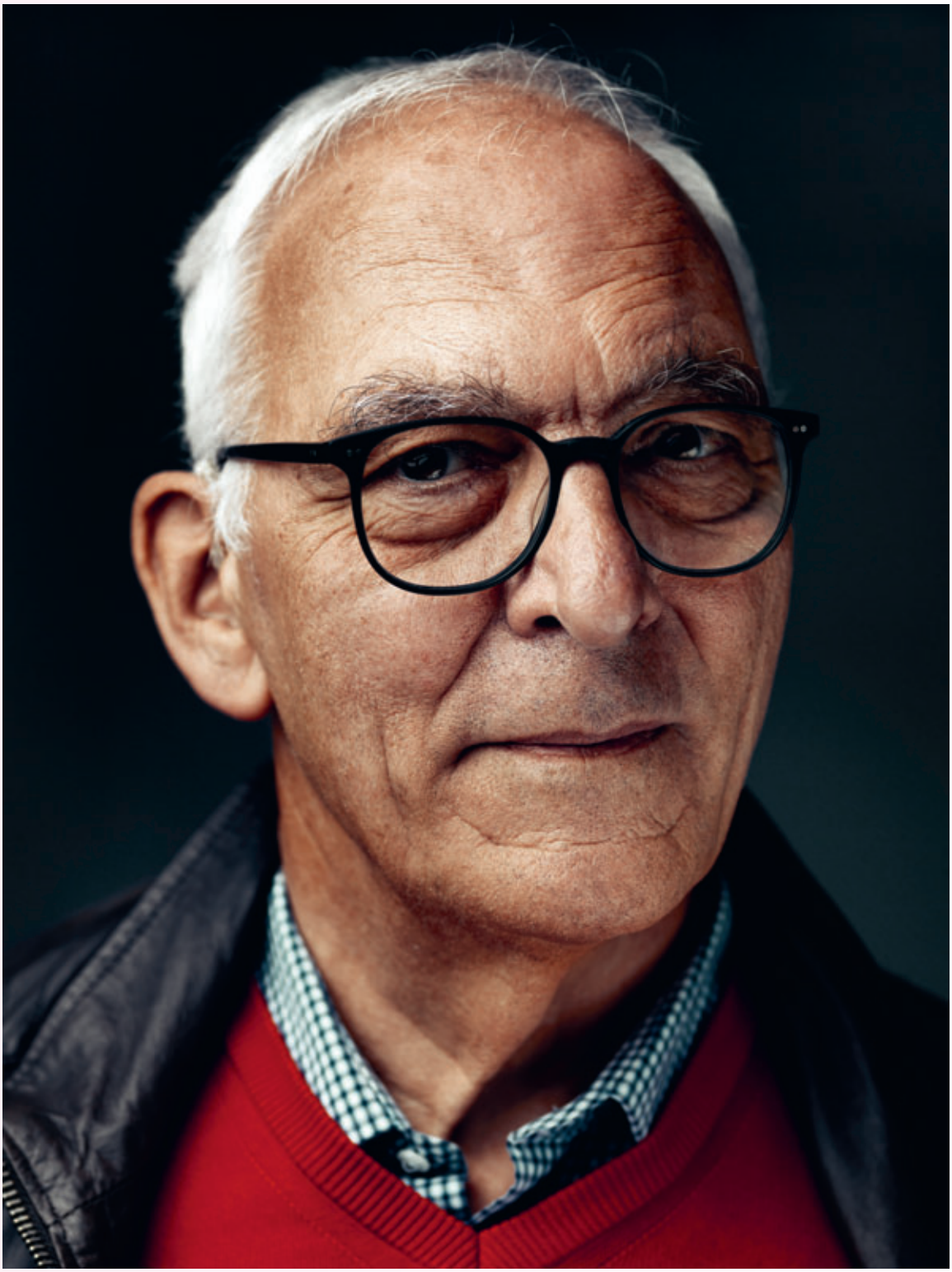
In the years after the initial report in 2002, the WHI data underwent numerous follow-up studies, some of which are still ongoing. Meanwhile, the authors have revised their initial statements: Hormone therapy is still associated with a minimally elevated risk of breast cancer. "But the bottom line of the benefit-risk balance is significantly more favorable, especially in terms of cardiac conditions," Bitzer says. It is important to start the therapy at the onset of menopause, so women experiencing symptoms can truly benefit from it. In other words: "Hormone therapy for older women is appropriate if it is really warranted," Bitzer says. "And that's it."

Healthy life philosophy

What is aging, really? Bitzer unfolds the palms of his hands as if he were presenting a treasure. "Healthy aging involves many aspects," he says. Most of all: plenty of exercise, but also a balanced diet, no smoking, maintaining a healthy weight, and alcohol only in moderation – the usual recommendations, because they really help. "Yet the most important things occur in the mind and psyche," says Bitzer. Leaning slightly forward, he adds: "It's about developing a life philosophy that helps you grow into this phase."

These are the main issues that arise at the menopause consultation at the Women's Health Clinic: How to deal with losses and accept that certain things are over and gone. How to recognize new opportunities such as grandchildren, new aspects of life, a different sexuality, a slower pace. "What's not helpful at all is this notion of 'forever young' or 'feminine forever'," Bitzer says. It is important to accept aging and seize the opportunities it brings. ■

The Women's Health Clinic at University Hospital Basel offers sexual health consultation where patients of both genders and couples can seek help with sexual problems.



Günther Räuper from Bottmingen, born in 1944, attends lectures at the SeniorUni on medicine, history and economics.

Demographics and the labor market.

What effect does an aging society have on the labor market? Instead of simply speculating, economics professor Conny Wunsch wants to deliver concrete answers – using a realistic model.

Text: Jörg Becher

Barely any other phenomenon attracts as much controversial debate as demographic change: Is the Swiss economy at risk of a serious skills shortage as more and more "baby boomers" reach retirement age over the next ten or fifteen years? Or can we simply continue to offset the foreseeable decline in the number of working-age people with a greater influx of skilled workers from abroad?

This overlaps with the uncertainties of the debate surrounding digitalization: If cultural optimists are to be believed, the likely advances in technology and artificial intelligence will lead to an unprecedented boost in productivity, with huge improvements in efficiency and prosperity. At the same time, however, other voices are urgently warning that up to 50 percent of existing jobs could be swept away by the rising tide of digitalization.

Adaptation and change

Taken in isolation, such predictions – and especially the horror scenarios – are complete nonsense, says Conny Wunsch, Professor of Labor Economics at the University of Basel. "Experience shows that technological advances only cause temporary job losses. That's because new job opportunities arise in parallel in other areas and compensate – or even overcompensate – for these losses. On top of that, most models completely ignore the ability of the labor supply to adapt to new circumstances," says the economist, who specializes in labor market issues.

As Wunsch explains, it is not only workers' ability to respond to shifting circumstances that is generally overlooked; current models of the impact of demographic change also fail to adequately consider changes in companies' demand for labor. She says that, for practical reasons, labor demand is typically taken as a constant, although certain parameters such as wages, for example, can vary. Furthermore, many companies are able to adapt to changes in labor supply – for example, by providing targeted in-house training or by plugging the shortfall in skilled workers with staff of similar skill levels or from related occupational groups.

As part of a Swiss National Science Foundation (SNSF) project, Wunsch wants to shed more light on such issues and bring greater objectivity to these controversial debates. "I think it's nonsensical to go for a one-size-fits-all approach," she says: "You have to take as nuanced a view as possible of the effects, because different problems also require completely different solutions."

Opposing developments

The researchers are initially focusing on developing a model of the domestic labor market that is as realistic as possible. It must not only take account of future demographic change but also reflect the interplay between labor supply and demand. The innovative aspects of the new model is that it accommodates dynamic adaptation mechanisms instead of excluding them from the outset. For example, these mechanisms include the effects of demographic change on product demand – senior citizens don't buy the same products and services as twenty-year-olds – and their repercussions for the labor market.

Indeed, a number of sectors (healthcare or elderly care, for example) will see a significant increase in labor demand as a result of demographic change. And, because many of the newly created service jobs can neither be digitalized nor automated, the aging society will boost job opportunities in certain sectors of the economy. In the IT sector, too, there will be considerably greater demand for certain technology-oriented positions – such as those involved in support, maintenance, as well as updating equipment and systems.

Digitalization and the aging society are, for the most part, two opposing developments: Whereas demographic change causes part of the labor supply to fall away, digitalization has a moderating effect on labor demand. "In the end, the two effects might not be that strong," says Wunsch, "because digitalization will offset some of the problems caused by demo-

Conny Wunsch
is Professor of Labor Market Economics at the University of Basel. Her research focuses, among other things, on the effects of demographic change on the labor market.

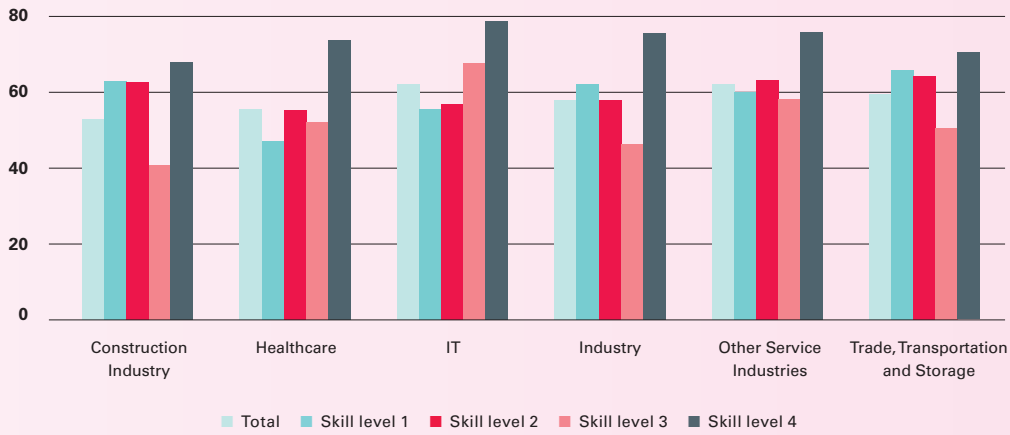
graphic change." As a result, instead of being a "job killer", the wave of digitalization could turn out to be a benign mechanism that helps us cope with the threat of an aging society.

In developing a model that allows for dynamic feedback effects, so-called "substitution elasticities" play a significant role. These indicate how easily a person with certain professional skills can be replaced by someone of a lower skill level. Based on a company survey, the research group has now created an "affectedness index" that reflects this (see table): On a scale of 0 to 100, the table shows how strongly demographic change affects certain industry groups, which are broken down into four skill levels. The lower the value, the more strongly an industry group is affected.

Impact on construction and health

The initial analyses reveal significant differences: Demographic change has a particularly strong effect on skilled workers in construction (index value: 41), whereas the IT industry should have barely any trouble replacing workers at medium skill levels (index value: 68). In contrast, the IT sector is more likely to experience a shortfall in highly skilled specialists. Overall, the construction industry and healthcare are the worst affected; and the effect on the IT sector and other service industries appears to be significantly smaller.

Later in the project, the researchers plan to conduct a major survey of students at the University of Basel in order to address the current gaps in information for estimating the future labor supply: Do young people choose the "correct" occupations – in other words, those that will be sought-after by businesses in a few years' time? Or do their educational endeavors fail to reflect the changing requirements of the labor market? "Instead of wildly speculating or making one-sided observations, we should finally take the opportunity to generate concrete knowledge," says Wunsch. ■



Affectedness index
How strongly demographic change affects certain industry groups, broken down into four skill levels. The lower the value, the more strongly an industry group is affected.

Combating muscular atrophy.

Text: Martin Hicklin

Even in older individuals, strength training helps to combat the loss of muscle mass. Known as sarcopenia, this "curse of old age" is the focus of a research project at the Biozentrum.

It can affect people as young as 50, and anyone who has reached 70 really should work against it. Bit by bit, it chips away at their strength and mobility, and the underlying causes are anything but clear. This insidious condition is known as sarcopenia, from the Greek sarx, flesh, and penia, poverty – and is considered the "curse of old age". Muscle mass is lost, and it becomes difficult to build it back in older age. The handshake becomes weaker, brisk walking becomes impossible, and falls become more frequent – often with disastrous consequences. If an effective way could be found to combat this process, it would be invaluable in more ways than one.

Disrupted equilibrium

Why the equilibrium between muscle build-up and breakdown deteriorates – and what exactly underlies these processes at the molecular level – is largely unknown, says Professor Markus Rüegg, a neurobiologist at the Biozentrum of the University of Basel. This gap in knowledge is all the more worrying given the growing number of susceptible older people in the population – and the serious consequences that this entails.

It made good sense, therefore, for researchers at the Biozentrum to set up a project focusing on sarcopenia, pooling their existing forces in order to investigate which regulatory systems are malfunctioning or no longer responding to signals. Rüegg has teamed up with Professor Christoph Handschin and the systems biologist and bioinformatician Professor Mihaela Zavolan. Research by multiple groups on the same topic has already proven to be valuable. This particular collaboration is funded by the Swiss National Science Foundation as part of the "Sinergia" program, and researchers who work on aging from Novartis are also participating in the project.

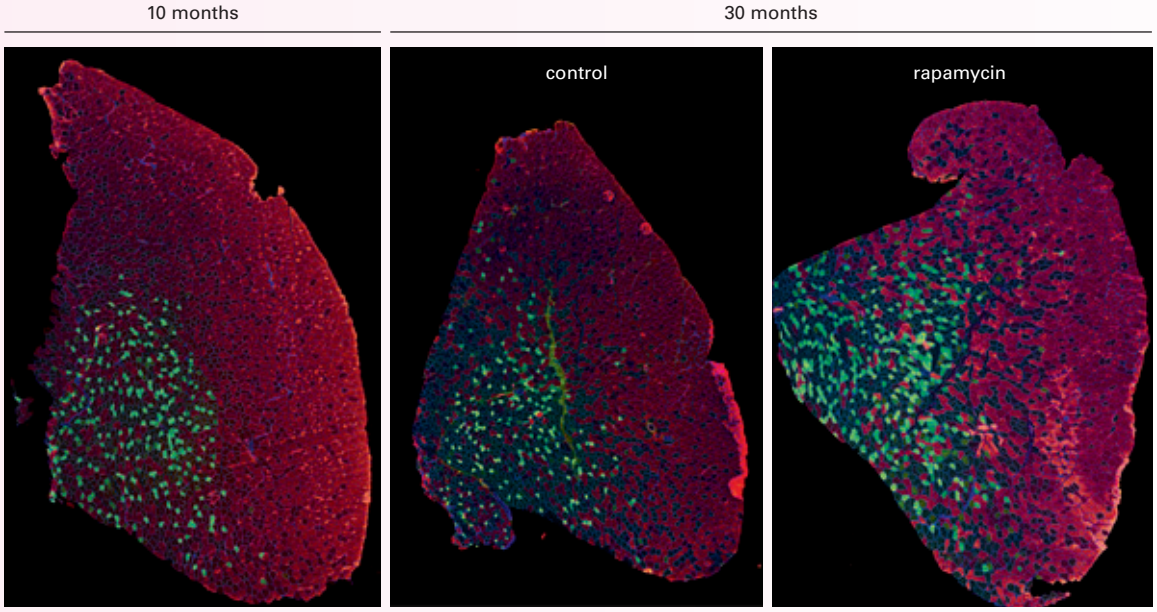
Markus Rüegg is Professor of Neurobiology at Basel University's Biozentrum. His research interests include neuromuscular disorders and muscle atrophy in general.

The necessary synergies are in place: Rüegg and his group study the processes that take place between nerves and muscles. They're also seeking therapeutic approaches to rare muscular diseases such as dystrophy, in which the signaling pathways and muscle build-up and breakdown are disrupted. This work also offers insights into muscular atrophy in old age. Handschin and his group investigate what happens to healthy muscles during training – surprisingly, a field in which many areas still remain unexplored. Handschin has also been studying a protein known as PGC-1α, which supports muscle function and connections to nerves by building up mitochondria, the so-called powerhouses of cells. Finally, Zavolan knows how to handle the large datasets that are collected during the experiments.

The control center inside cells

The Biozentrum also has another ace up its sleeve. Its researchers are well acquainted with a central control center inside the cell, which also plays a key role in the function and maintenance of muscles. It goes by the name of mTORC1 – short for mammalian target of rapamycin complex 1 – and was discovered last century by the award-winning biochemist Professor Michael N. Hall, who is also a researcher at the Biozentrum. "I've already collaborated with him in the past," says Rüegg.

mTORC1 remains one of the focuses of the sarcopenia project. This cellular controller detects the availability of nutrients by responding to the protein building blocks (amino acids), as well as to the energy status of a cell and other factors needed for building proteins. If something is missing, the mTOR complex inhibits the production of proteins, including those destined for the muscles. "We know at least that mTORC1 can impede muscle build-up and accelerate the onset of sarcopenia," says Rüegg. Rapamycin and



Cross sections of a lower leg muscle (tibialis anterior) from healthy, ten-month-old mice (left), from 30-month-old mice that received a low dose of rapamycin in their food (right), and from a control group of the same age (center). Rapamycin delays the onset of muscle atrophy in the older mice, preserving muscle size and increases the number of oxidative (in green and black) and glycolytic (in red) muscle fibers. (Photo: Daniel J. Ham & Markus A. Rüegg, Biozentrum).

other "rapalogs" with a similar structure inhibit mTORC1. However, if the switch – mTORC1 – is turned on, because all of the components are present, proteins needed for cellular life are produced. This is the mechanism by which mTORC1 determines cell size and growth.

Fasting prolongs lifespan

Conversely, a process known as autophagy (self-eating) is accelerated, ensuring that defective proteins with incorrect folding are degraded and that their useful components become available again – like on a sort of spare part exchange. Fasting and jogging cause the body to switch over to this process, which might be why some people say they feel better after fasting. They actually are in tidier shape. After just 24 hours of hunger, a mouse begins to break down its muscles and restructure its body. Fasting – also referred to as calorie restriction – prolongs the lives of mice (and monkeys).

Autophagy is an important homeostatic process that can also break down. It may be that some things become less effective with increasing age, some thing or other just stops and then gets in the way. The "Sinergia" project in Basel has set out to better understand these processes, which are influenced by numerous factors. A series of mouse models – including from Novartis – are now either available or under development, allowing researchers to investigate the role of each factor.

Helping to improve quality of life

This work is not without its surprises. Indeed, it has already delivered results that run counter to expectations. For example, the permanent activation of mTORC1 in a mouse does not simply result in bigger muscles, but can actually cost the mouse its life. It may also be that, in old age, mTORC1 is constantly set to a slightly higher level of activation, and that it might be sensible to exert a dampening influence. This will become clear in a subsequent stage of the research, which is expected to produce the first generally applicable findings. "Presumably, the best solution would be a balance between stimulation and inhibition," says Rüegg.

What is certain – and indeed proven – is that strength training has benefits and triggers protein synthesis even in older people. The signal pathways that are switched on in our early years are still present in old age. They are just less efficient. "We're currently analyzing molecular data and will then proceed with new models based on the results," Rüegg says of the prospects for future research. In any case, this remains a hot topic in science. There is great hope that advances in modern technology will also pave the way for substantial improvements in quality of life until well into old age. ■

Bridging the generation gap through exercise.

Text: Céline Eugster

Children and older people alike often get less exercise than they need. Sports researchers in Basel are tackling this problem with projects aimed at getting the two groups moving – together.

Lukas Zahner
is Professor of Exercise and Training Science at the Department of Sport, Exercise and Health (DSBG) at the University of Basel.

A child and her grandfather try to balance on a wobbly beam, while a pedal-powered fountain gurgles nearby. In Basel's Schützenmatt park, a dazzling array of exercise equipment is buzzing with users young and old in constant motion. The devices, specially designed to train strength and balance in a playful fashion, are a gift to the city of Basel from the Hopp-la Foundation – an intergenerational program promoting exercise and health that has its roots in a master's project at the University of Basel's Department of Sport, Exercise and Health (DSBG).

The idea behind the project is simple but efficient: galvanizing older people to move around more by exercising with their energetic grandchildren in the open air. Since its inception, the pilot project in Basel has expanded to include other areas of Switzerland. This reflects a key concern of the University of Basel researchers behind the project: ensuring their findings are implemented in practical applications, as Lukas Zahner, Professor of Exercise and Training Science, explains.

Increased happiness

Research has shown that an individual's muscle strength and sense of balance rise and fall over the course of their lifetime. Accordingly, in children these capabilities have not yet been fully developed, while in older people they are in decline. This is where the research projects in Basel come in. The practical side of things is dealt with by the Hopp-la Foundation. In concrete terms, this means safe walking and fall prevention. Among older people, quality of life, health satisfaction and autonomy, along with their fear of falling, are to a large extent determined by physical activity. Exercising with others and developing balance and strength in a spirit of mutual encouragement is not just logical, but also a great deal of fun. The pleasure children take in movement is passed on to older people, with physical, psychological and social benefits for both generations.

Documenting the advantages of exercising together in this way is the goal of a dissertation project currently in progress at the DSBG, devoted to demonstrating the added benefits of intergenerational training as compared to age-specific training. For example, besides building strength and balance, doing sports with children or grandchildren is thought to boost older people's practical and social autonomy and health satisfaction, Zahner says. This means that emotional and social factors are just as important when it comes to fitness in old age.

Extending independence

More exercise brings a raft of benefits for older people, both physical and psychological. "Exercise and sport do more than help prevent falls," says Zahner. For instance, an active lifestyle can be just as effective as medication in combating type 2 diabetes or mild depression. "Our intergenerational approach is probably the most economical, quite aside from all the positive side effects," he adds.

What is more, Zahner believes that exercise can also translate into cost savings if it helps people remain independent to a more advanced age. Considering that over-50s are currently the largest age group in the Swiss population, such findings are extremely relevant.

Of course, the cost-cutting potential of physical exercise is not restricted to old age. In a new research project, Zahner is studying the benefits of "Personal Health Coaching", an approach in which "couch potatoes" are prompted to exercise by regular phone calls. The method has shown promising results, with subjects exercising more frequently even after the end of the six-month coaching period. Plans are in place to expand the model, which could also be applied to diabetics, pregnant women, people with back problems, and older people. This kind of preventive strategy could save health insurance companies a great deal of money in future, Zahner predicts – after all, "exercise is often the best medicine." ■

hopp-la.bbf.de.com, kraeftig-altern.ch

Eva Breu from Basel, born in 1946, attends lectures at the SeniorUni on social issues, medicine, health as well as art and literature.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Fitness in healthy individuals.

Endurance, strength and coordination are key aspects of physical fitness. But what are the normal values for healthy individuals at different ages? Sports medicine physicians and sports scientists are currently gathering data from 490 people from the Basel region aged between 20 and 100. This will allow individual test results to be classified more accurately in the future.

Photo: Basile Bornand

Arno Schmidt-Trucksäss is Professor of Sports Medicine and leads the Complete-Project (complete-project.ch).

Jonathan Wagner is writing his doctoral dissertation on the application of spiroergometry as well as strength and balance measurements with a view to improving the performance assessment of healthy individuals and cardiac patients.

Michèle Müller is studying sports science and working on her master's project as part of the Complete studies.

1 On the bicycle ergometer, subjects are pushed to the limits of their performance while the researchers study the interplay between breathing, circulation and metabolism.
2 A spiroergometry system is used to analyze how much oxygen is absorbed from inhaled air and how much carbon dioxide is exhaled. This can be used to determine the maximum oxygen uptake – an important measure of fitness.
3 Standardized gas mixtures are used to calibrate the measuring instruments.
4 A stress ECG records how the heart's electrical activity varies during physical exertion.
5 The analysis also records blood pressure and numerous other parameters – such as respiratory volume and the individual perception of exertion.
6 Based on lactate values, it is possible to draw conclusions about energy metabolism and endurance performance. This is done by taking a series of blood samples from the subject's ear.
7 The spiroergometry examination is preceded by further analyses, including vascular health, leg strength and gait, as well as blood tests.

Corruption: What is the problem?

What are the mechanisms behind global corruption and what is the best way to combat it? A social anthropologist and a political scientist each look for answers.

In many countries around the world, people have no difficulty in identifying corruption as the main source of political and economic ills. Taxi drivers will invariably bemoan corrupt politicians and parties, and opposition parties denounce the corruptness of those in power. An international consensus has by now been reached that corruption truly hampers a country's economic, social and political development. This consensus should not be taken for granted, given that corruption was once downplayed as part of the "teething troubles" of modernizing states during the first few decades of independence for postcolonial nations. What is equally clear today is that, far from being a mere cultural phenomenon, the corruption in these countries served tangible strategic and economic purposes: Former colonial rulers used all manner of material benefits to bribe and prop up political elites that benefited their economic and ideological interests. Most of these forms of preferential treatment would be considered corruption today, ranging as they did from expensive trips to Paris or London for high government officials and their entourage to lucrative contracts for the supply of military or other equipment that were of no advantage to anyone except the company involved and a few influential politicians. The damage wrought by corruption went far beyond bloated, misdirected government spending. The upshot has been a systemic loss of trust in institutions and procedures.

With the end of the Cold War those involved in providing foreign aid came to realize that corruption undermines any form of collaboration to support sustainable development. Under the heading of „Good Governance" – which comprises anti-corruption measures – a range of programs are still being implemented that are aimed at strengthening the transparency, integrity and accountability of public institutions and so make them more effective. There is no doubt that these are noble and worthy goals. However, it is worth asking whether they really address the systemic causes of corruption. Today, these include global financial flows that are hard to track – think Panama Papers – which plays into the hands of illicit or criminal interests. The trade in raw materials such as coltan, tantalum or gold is a case in point. Corruption is at play everywhere, from licenses granted by governments to kickbacks for local authorities. Despite all national and international efforts, it can be uncovered only in isolated cases. The opaque linkages between corporations and governments seem fundamentally to persist, as evidenced more recently by the Siemens, Petrobas/Odebrecht and similar scandals, which brought to light worldwide systematic bribery to the tune of millions (and an aggregate of billions) of dollars.

It is these impenetrable global interconnections that make corruption the problem that it is. They remain unaffected by isolated and politically motivated foreign aid interventions to support collaborative development efforts. What is needed is far greater determination at national and international levels to enforce cross-sector measures that take no account of particularistic interests of states and companies. ■

Lucy Koechlin
is Senior Lecturer in Political Anthropology at the University of Basel's Institute of Social Anthropology and Centre for African Studies. As well as working as an expert on corruption and governance, she is currently carrying out research on political articulation and urbanization in Africa. She is the author of *Corruption as an Empty Signifier: Politics and Political Order in Africa* (2013).

Promoting economic growth and alleviating poverty have been essential goals pursued for decades by the international community through the activities of numerous international and bilateral organizations. During the 1980s, as economic crises spread across the developing world, international institutions recommended strict austerity measures and neoliberal reforms to open up the affected economies to free trade and constrain the role of the state in the economy. By the mid-1990s, disappointing outcomes in terms of growth and poverty alleviation in countries that had diligently adopted the neoliberal agenda called this whole approach into question. And so the discourse shifted: The problem was not with free markets but rather with governments that were incapable of correctly applying the reforms. Corruption and weak governance then became the main culprits for the lack of progress in promoting development.

After more than 20 years since the fight against corruption was made a priority on the international agenda, the results continue to disappoint. How can this lack of success be explained? I argue that the adoption of anti-corruption as a priority for development actors is problematic because international and bilateral donors, by the very nature of their relationship with recipient countries, must avoid being seen as intruding in their political affairs. The fight against corruption therefore became a technical affair.

International best practices have overwhelmingly emphasized the adoption of robust legal and institutional frameworks (often resembling those of advanced Western democracies) as well as efforts to build capacity and raise awareness to empower local stakeholders to resist and denounce corruption. Certainly, many of the most endemically corrupt countries now have sound laws and regulations; however, few of them are consistently observed and enforced in practice. The result is a form of isomorphic mimicry: state institutions and laws that look like those of donor countries but with little of the function.

Comparative research from regions as diverse as sub-Saharan Africa, Central Asia and Latin America indicates that corruption is linked to informal practices of elites aimed at creating governability by rewarding supporters and co-opting opponents through strategic appointments to positions of power. The recipients of these privileged positions are allowed, with impunity, to exploit the power and resources associated with public office in exchange for mobilizing support and maintaining loyalty to the regime. Taken from this perspective, the lack of "political will" to punish the corrupt comes as no surprise. Average citizens, who unquestionably suffer the consequences of corruption, are not necessarily natural advocates of anti-corruption. Unmet needs are the main reason for tolerance of corrupt practices, because practices of bribery and favoritism are seen as strategies for "getting things done".

How do we move forward? While it is important to address "technical" challenges, such as weak legal frameworks and a shortage of officials trained to investigate serious financial crime, this will almost certainly not be enough. We must go deeper into our understanding of local drivers of corruption in order to develop strategies that address them effectively. One size does not fit all. Researchers and practitioners should be encouraged to think creatively to develop anti-corruption reforms that take into account the incentives of their intended beneficiaries and that work with – and not against – widely accepted social, political and economic relationships. ■

Claudia Baez Camargo
is Head of Governance Research at the Basel Institute on Governance, an affiliate of the University of Basel. She works as a consultant on projects to develop strategies for the prevention of corruption in the public sector. Claudia grew up in Mexico and studied political science at the University of Notre Dame (USA) and economics in Cambridge (England).

3D models for medicine.

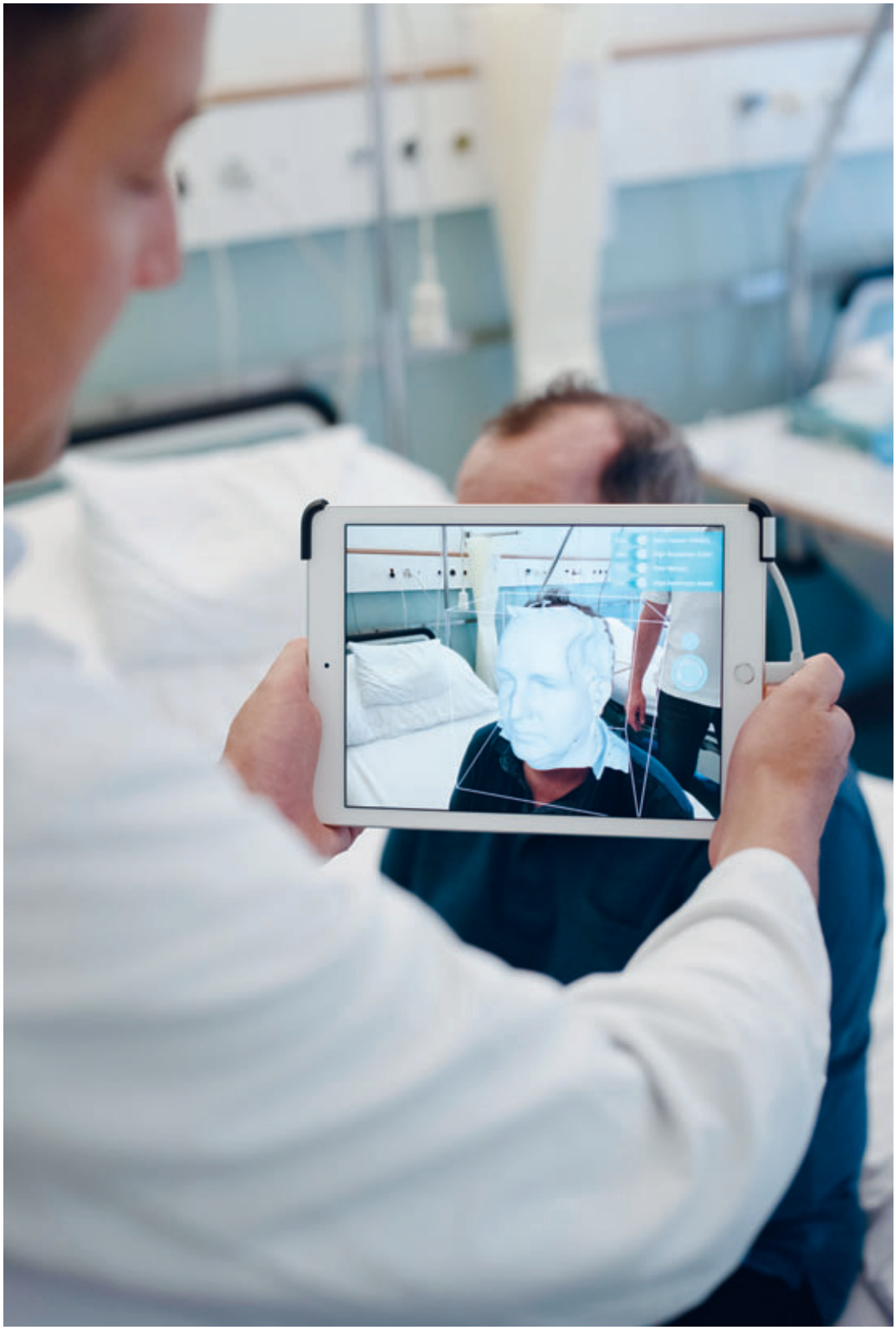
Photos: Christian Flierl
Text: Reto Caluori

The rapid adoption of 3D printing in the world of medicine is leading to a steady stream of new applications in hospitals. For example, surgeons and radiologists are using the technology to create tailor-made implants and to plan complex operations in advance. The models are created using data from imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI). Based on these cross-sectional images, the University Hospital can use its own 3D printers to create a full-scale model that precisely replicates an individual patient's anatomy.

Interpreting CT scans on a screen is a challenging task – even with the help of 3D simulations. By contrast, the printed models allow physicians to intuitively grasp anatomical relationships, the course of different tissues, and the overall dimensions.

As a result, physicians can gain a precise idea of the situation they will encounter during operations, such as when dealing with skull and facial fractures, kidney tumors or complex heart surgery. The models have also proven to be a useful visual aid in teaching and training when explaining planned operations to patients. Moreover, 3D printers allow implants to be designed with high precision so that surgeons can operate faster, more accurately and with greater success. Patients therefore benefit from shorter sedation times, and the hospital saves on expensive minutes spent in the operating room.

usb.ch/3DPrintLab



If the bone fails to heal and must be removed following an operation, the resulting hole in the skull leaves the brain beneath unprotected. Physicians plan to reseal the cranium using an artificial plate. A visual 3D scan of the patient`s skull is created; surgeon Dr. Dr. Florian Thieringer shows the data on the tablet (left).

Radiologist Dr. Philipp Brantner prepares the CT data for 3D printing in order to create an exact anatomical replica (right).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University Hospital Basel has more than 20 different printers, which can produce models from plastics and titanium, as well as from sterilizable, medically certified materials.

The model of the skull with a hole in one side is created using a 3D powder printer in a technique that makes do without supporting structures (left).

Precise replicas make it easier to plan surgeries. They also provide an ideal visual aid for patient consultations and for training purposes – in red, the model of the artificial skull plate.

The implant, which was created using the 3D-printed template, allows the team of surgeons working under Dr. Dr. Florian Thieringer and neurosurgeon Dr. Jehuda Soleman to seal the defect in the cranium.

Philipp Brantner is a radiologist and co-director of the 3D Print Lab; he works as an attending physician for cardiac and thoracic diagnostics at University Hospital Basel.

Florian Thieringer is assistant medical director of craniomaxillofacial surgery at University Hospital Basel and co-director of the 3D Print Lab. He also leads the Medical Additive Manufacturing research group at the University of Basel's Department of Biomedicine.

Marijuana and happiness research.

Text: David Hermann

As smokers will know, tobacco consumption has been subject to increasingly strict regulation in recent years. Smoking is now prohibited in offices, in restaurants, and more often also in public places such as train stations. Tobacco advertising has been banned almost entirely, and the age limit for buying tobacco has been raised. With these measures, the state is seeking to protect its citizens from the adverse effects of smoking. After all, many people struggle to stick to their healthy lifestyle plans in the long term, and so it might be beneficial for everyone if the state intervenes through regulation, such as by tightening up the prohibition of tobacco. At the same time, however, a growing number of authorities are relaxing the laws on cannabis.

In the USA alone, almost two thirds of states have made it easier to access cannabis, and its medical users are protected from prosecution. Nine states have gone as far as to legalize the consumption of cannabis altogether. Similarly, this summer, Switzerland's National Council and Council of States adopted what is known as the "experimental article". The revised federal act regulating the use of hemp is intended to clear the way for scientific studies into the effects of cannabis consumption for medical purposes.

Well-being and welfare

Analyses of this topic generally focus on the parameter of consumption, which the WHO also sees as a key indicator of the effects of greater liberalization. If consumption falls, the change is an unmitigated success; if it rises, it is a flop. "We weren't satisfied with this answer," says Alois Stutzer, Professor of Political Economy at the University of Basel's Faculty of Business and Economics and director of the Center for Research in Economics and Well-Being. Stutzer is interested in the effects of altered structural conditions on individual well-being and therefore also on general welfare. "The consumption figures aren't suitable for this. Just because a person consumes more of something doesn't mean they are happier, and certainly not if they're taking hard drugs," he explains. "A policy that reduces smoking is not a successful policy per se if people are smoking for pleasure."

The professor says that happiness research – and specifically happiness economics – provides useful answers to this question. This relatively young discipline combines economic concepts and theories with insights drawn from sociology, psychology and med-

icine. For happiness economics, welfare is indicated not only by growth in GDP and productivity, but also by high reported life satisfaction and high individual well-being.

Liberalization has a positive influence

In an empirical research project, Stutzer has teamed up with Jörg Kalbfuss and Reto Odermatt to find out how the legalization of medical marijuana affects people's net well-being in the USA. Although nothing has been published yet, the economist says that the initial results are promising, with extensive calculations and confirmation tests demonstrating "a clear relationship between liberalization and mental well-being".

A total of 31 US states have relaxed their laws on cannabis in the last 15 years. This provides an almost perfect testing ground for empirical analysis: If one state relaxes its laws and another does not, the two states nevertheless share similar economic, social and political frameworks. Any variations that occur after the change in the law can, in all likelihood, be attributed to the loosening of prohibition. In a more centralized country than the USA, however, effects of this kind are difficult to isolate.

The study is based on data from two regular surveys of the US population. One provides information on behavioral risks, such as those relating to driving, sports or obesity. Stutzer and his colleagues are primarily interested in mental health – for example, in the number of days per month for which respondents experience negative feelings such as stress or depression. Parameters of this kind are taken as an indicator of subjective well-being. The other database is the National Survey on Drug Use and Health, which provides information about the individual reasons for cannabis consumption.

"Not a free pass for legalization"

Stutzer's studies show that people who consume marijuana for medical reasons enjoy better mental health in states with relaxed regulations. They can now purchase cannabis products legally in a stress-free manner at specific sales outlets or grow a few plants legally themselves. Even people who smoke cannabis recreationally are no worse off than before liberalization. "However, these results are not a free pass for the complete legalization of cannabis," says Stutzer. "In our view, that would be an inappropriate extrapolation of our findings." After all, many of what he sees as the key questions in this context remain unanswered – such as how to deal with highly potent cannabis products, the approval of advertising, or age restrictions for children and young people.

Users of medical cannabis in the USA experience greater mental well-being if access to it is liberalized. This finding from happiness research by Basel-based economist Alois Stutzer could also have important implications for Switzerland.

In the course of their analyses, Stutzer and his team stumbled across an interesting secondary result. Faced with a widespread opiate crisis, the US is currently tightening up access to these drugs. Patients therefore seek out a replacement and consume more alcohol and hard drugs instead – with enormous resulting costs. There is, however, an easy way to avoid this: As Stutzer explains, tighter access to prescription drugs as pursued in mandatory monitoring programs is far more effective if it is accompanied by easier access to cannabis products.

Stutzer's analyses are also relevant to Switzerland, which – like the USA – has a highly federal structure. For this reason, the Basel economist also supports the "experimental article", which would allow the first scientific trials to get underway in Switzerland. "Federalism is very useful in this respect," says Stutzer. "Switzerland offers the ideal framework for testing the impact of a liberal approach to cannabis in a real-world laboratory." However, it will probably be some time before he can replicate the studies conducted in the USA here in Switzerland. ■

New neurons for the brain.

New neurons are made by stem cells located in the adult mammalian brain. Much remains to be understood about this process, known as neurogenesis – but there are hopes that one day it could be harnessed to promote brain repair.

Text: Yvonne Vahlensieck

Fiona Doetsch is Professor of Molecular Stem Cell Biology at Basel University's Biozentrum. Her research focuses on stem cells located in adult mammalian brains.

Throughout our entire life, our bodies are fighting decay: specialized stem cells continuously supply new cells for our blood, skin, and internal organs. For a long time, however, neuroscientists believed that this renewal of cells was not possible in the brain. "An adult brain does not make new neurons" was dogma for a century.

Then a revolution in neurobiology overthrew the old model. Around 50 years ago, evidence emerged that new neurons can in fact be made in the adult brain. Since then, stem cells located in specific areas of the brain have been found to be behind this process. Nevertheless, a great deal remains to be understood, such as how these new neurons participate in brain function and whether stem cell growth can be stimulated by external factors. It is hoped that finding the answers to these questions might one day lead to stem cells being used to repair brain damage.

Migrating cells

One of the two areas of the brain in which researchers have found stem cells, the lateral ventricles, are the focus of research carried out by Fiona Doetsch at the University of Basel's Biozentrum: "Such stem cell niches are highly complex," explains the Professor of Molecular Stem Cell Biology. The niches provide a microenvironment that fosters and nourishes stem cells. It is also here that they receive the signals telling them to differentiate into specific cell types and then migrate to other areas of the brain. Several years ago, Doetsch and her team showed that the stem cells in the lateral ventricles are a type of glial cell: "Since then we have been trying to understand how these stem cells are maintained and what activates them."

One of the main tasks of the stem cells in the lateral ventricles is to make neurons for the olfactory bulb, a brain region crucial to our sense of smell. "In mice approximately 30,000 new neurons migrate daily from the lateral ventricles to the olfactory bulb," Doetsch explains. To this end, the cells form long chains and flow through a tunnel made up of glial cells. Upon arrival in the olfactory bulb, the new neurons integrate into existing circuits, where they help transmit odor signals captured by the nose to the brain.

Which factors affect the activity of stem cells is only partly understood so far. However, research has

shown that the formation of new neurons is suppressed by stress and boosted by physical exercise, for example. "This result reveals that external stimuli can also impact the generation of neurons," says Doetsch.

A mosaic of stem cells

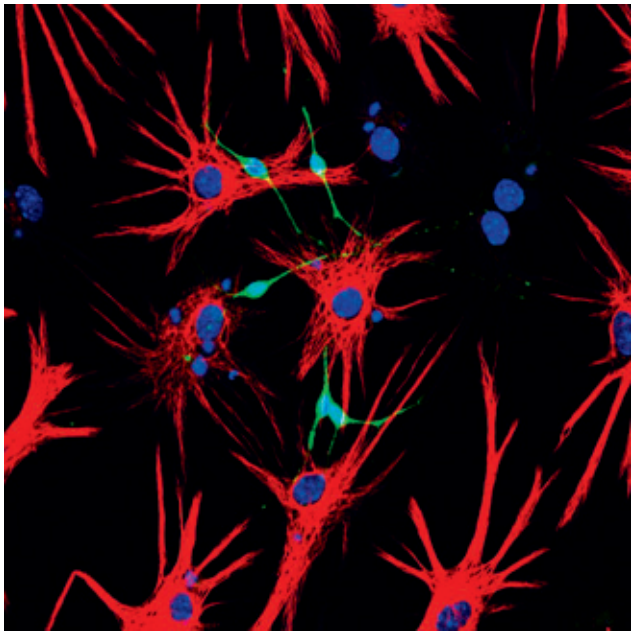
In an effort to identify these stimuli, the Canadian-born stem cell biologist has undertaken a detailed investigation of the stem cell niche. Initially, all that was known was that stem cells are located in a thin layer near the ventricle walls. Now it is clear that the stem cells are arranged in such a way that on one side, an extension of the cell known as a process touches the cerebrospinal fluid which flows through the ventricles. On the other side, a process contacts blood vessels. Furthermore, the stem cells are connected to neurons from other brain areas. This means that stem cells receive and process information about the state of the organism from multiple sources.

The latest results from Doetsch's laboratory highlight the complexity of the stem cell niche: The stem cells located there are in different states, forming a mosaic of activated and dormant cells. What is more, their location inside the niche provides information about the type of cell they will differentiate into after activation. "But it is still not known whether the same pool of cells is giving rise to new neurons under normal conditions as for repair of brain damage."

Key role for neurotransmitters

This investigation into the niche's structure revealed the sources that stem cells receive signals from, but identifying the molecules involved required different experimental approaches. "We have tried for many years to activate the stem cells," recalls Doetsch. But it was not until she tested a library of over 1,000 known biologically active compounds that she succeeded: It emerged that certain neurotransmitters – the chemical messengers of the brain – play a crucial part in activating stem cells. One of these transmitters was beta-endorphin, which in other contexts is released by the brain in response to pain or stress, for example.

This result led Doetsch and her team to the discovery that beta-endorphin-producing neurons in the hypothalamus are in contact with a highly specific subset of stem cells via long-range fibers, regulating the formation of a particular subtype of olfactory bulb neurons. The division of this subset of stem cells is also influenced by different feeding patterns such as fasting, via the activity of these hypothalamic neurons. Accordingly, it is possible that the stem cells could help mice adapt to variations in food supply. These findings confirmed that certain factors can stimulate the production of different types of neurons by stem cells depending on the situation and environmental conditions.



Star-shaped stem cells (red) give rise to new neurons (green).

Towards brain repair?

The extent to which these findings, obtained primarily from experiments in mice, can be applied to humans, is currently unclear. There is no question that stem cells are also present in the human brain – so in principle the potential for neuron renewal exists. But the degree to which it actually occurs in humans is currently a point of great contention among neuroscientists.

Nevertheless, researchers like Fiona Doetsch hope that they will one day be able to decipher the signals that regulate stem cells. This could make it possible to activate them in a controlled manner and direct them to specific brain areas. Brain damage resulting from, say, a stroke or Alzheimer's disease would then no longer be irreparable, but curable. ■

Criminalizing the veil?

Switzerland is set to vote on whether covering one's own face should be a punishable offense. Having weighed up the arguments employed by proponents of the initiative, Basel legal scholar Bijan Fateh-Moghadam concludes that a general ban on face coverings is incompatible with the country's liberal federal constitution.

Text: Tobias Ehrenbold

No other garment is as hotly debated in Europe as the face veil worn by certain women of Muslim faith. A little over ten years ago, the question of whether burqas or niqabs should be banned in public was still a purely hypothetical one in Europe, recalls Bijan Fateh-Moghadam, Professor of Legal Theory and Life Sciences Law at the University of Basel. Back then, hardly anyone was interested in the relationship between religion and criminal law – one of Fateh-Moghadam's research areas, alongside biomedical law. A short time later, the debate on "burqa bans" had spread like wildfire, with several Western democracies seeing a resurgence of state-imposed dress codes.

Following bans already in place in countries such as France or Austria, Switzerland is expected to vote on a nationwide ban on face coverings in 2019. If the proponents of the popular initiative have their way, wearing a face veil will become a criminal offense. Fateh-Moghadam looked at how their arguments hold up from a jurisprudential point of view. "From a criminal law perspective, the key questions are: Who or what is the ban intended to protect? And is the ban necessary in order to safeguard free and peaceful coexistence in Switzerland?"

Muslim women are not hooligans

The popular initiative takes its cue from the canton of Ticino. In the first two years after the ban was introduced there, charges were brought against a total of 37 people. Of these, 30 were masked sports fans, and less than five were women wearing face veils. On one hand, these figures reflect the scarcity of burqas and niqabs in Swiss public life, Fateh-Moghadam reflects. However, he is reminded of the posters used to campaign for the ban. They depict a fully veiled woman next to a football hooligan brandishing a Molotov cocktail – a highly problematic juxtaposition that Fateh-Moghadam sees as tantamount to discrimination against a religious group.

What is more, he argues, a ban on face coverings is not needed to tackle the problem of masks at demonstrations or sporting events, as this issue is already covered by existing security legislation. He believes that the controversial conflation of Muslim women and hooligans reveals the initiative's true motive: portraying the Muslim faith as a threat to public security. In other words, right-wing populist propaganda rather than a serious attempt to find solutions for the real social problems arising from migration.

Punishing the victim

"It is perfectly legitimate to expect the state to intervene if women are being forced to wear a veil," Fateh-Moghadam clarifies. "This goes without saying, as it would constitute an infringement of that woman's rights: her religious freedom and her right to self-determination, which includes the right to dress as she chooses. However," he adds, "forcing someone to wear a veil is already an offense – the criminal offense of duress (Art. 181 of the Swiss Criminal Code)."

What the expert finds absurd is that the ban is aimed at women who are presumed to be wearing a face veil involuntarily. "It is precisely in cases where we think that women are being forced to wear the veil that the ban makes no sense, as it would punish women who are being coerced by their husbands or some other third party." Applying criminal law to the victim renders it inherently self-contradictory, he argues.

Aside from the fact that face veils worn in public are a rare sight in Switzerland anyway, there are no studies indicating that women are being forced to cover their faces. "The vast majority of these women appear to be wearing the veil for religious reasons of their own free will," says Fateh-Moghadam. "Many of them are

converts – Swiss women, for example, who have adopted orthodox forms of Islam." In these cases, it makes little sense to argue that the veil is worn by compulsion, he points out, adding that for these women to be affected by the ban would be a violation of their religious freedom and freedom of self-expression.

Tolerance or neutrality?

Fateh-Moghadam is heartened by how clearly the Swiss Federal Council expressed its commitment to the liberal constitution in its counter-proposal. Ultimately, he believes, the initiative is less about the actual issue of face coverings than it is about the fundamental relationship between state and religion. "I have observed a gradual shift in the principles that guide legislation on religion. Unfortunately, the trend is a regressive one." Historically, he traces a progression from religious legal systems, under which minorities were repressed, to limited conceptions of tolerance, and finally to the modern principle of state neutrality.

Fateh-Moghadam advocates neutrality, he clarifies. He believes it is an accomplishment that issues pertaining to the choice of religion or world view are left entirely to civil society. However, he fears that this principle is now under threat from the rise of tolerance as a legal principle. Counterintuitively, tolerance is actually a backwards step when it comes to jurisprudence, he explains: the ban on face coverings, or the minaret initiative already adopted in Switzerland, are instances of a state taking a religious and ideological stance, and saying "we" – the Christian majority – are tolerant of religious minorities, but our tolerance has limits – which we are now defining.

The return of religion

In this sense, tolerance as a legal principle constitutes a return to a religiously and ideologically defined understanding of the state, he argues. Repressive "tolerance laws" such as a ban on face coverings are, he adds, incompatible with a liberal, religiously and ideologically neutral conception of the federal constitution. "The proponents of the initiative claim that the veil has no place in Swiss culture," Fateh-Moghadam says. "But a defining characteristic of culture is precisely that it does not depend on legal enforcement for its survival. If not covering one's face is a part of Swiss tradition, then this tradition will prevail with or without a ban." ■

Bijan Fateh-Moghadam is active in teaching and research as Professor of Legal Theory and Life Sciences Law at the University of Basel's Faculty of Law.

Repressive rules on clothing is incompatible with the country's liberal federal constitution: Woman wearing a niqab.

Conservation biology

Climbing reduces biodiversity.

As an outdoor leisure activity, sport climbing has become significantly more popular in recent decades – including on the limestone cliffs of the Jura. These rocky areas provide a habitat for a multitude of plants and animals, including a number of rare and endangered species. Now, the growing popularity of rock climbing is putting flora and fauna at risk. That is the conclusion reached by conservation biologist Professor Bruno Baur of the University of Basel, who – along with his team – has studied the habitats of the limestone cliffs in the northern Jura mountains. The researchers examined the situation affecting 240 plant and 66 land snail species in various sections of the rock cliffs: at the base, on the face, and on the plateau. They found that the diversity of plants was reduced by 28.1% on heavily used climbing routes, especially in the lower areas of the cliffs. With regard to the land snails analyzed in the study, the species richness was 13.7% lower on heavily used climbing routes than it was away from the routes. For both the plants and the snails, the species composition primarily depended on whether they lived on an intensively used climbing route or not. As the conservation biologists report, the biodiversity fell even at less frequently used locations. To combat this problem, they suggest running information campaigns to highlight the potential impact of intensive sport climbing on flora and fauna. ■

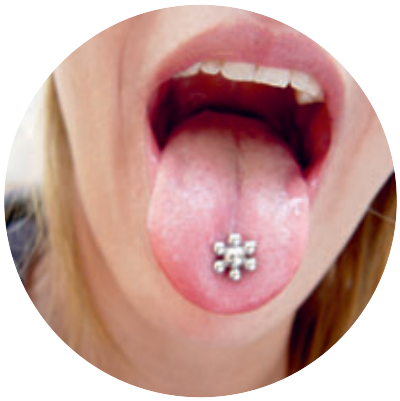
Dentistry

Piercings and periodontal disease.

Lip and tongue piercings have an adverse impact on gums and teeth in their close proximity. That is according to a recent study carried out by Salvatore Calderaro for his master's thesis under the supervision of Professor Clemens Walter at the University Center for Dentistry, Basel. The study looked at 14 female and four male patients between the ages of 28 and 36 who had either a lip or tongue piercing or both. As well as clinical parameters, a record was also made of the maximum wearing time of the piercing. Furthermore, the experts compared the inflammatory parameters of the periodontal tissues close to the piercings with those further away.

This allowed the team of researchers to establish a relationship between oral piercings and increased periodontal inflammation, which was reflected in heavier bleeding on probing, greater probing depths, and the loss of tissue supporting the teeth. The smaller the distance to the piercing, the greater the damage was to the periodontium.

Walter's attention was drawn to the subject of piercings by an unusual case: A patient with a tongue piercing had good periodontal health except for his lower incisors, and the known risk factors had been ruled out. Non-surgical and surgical interventions were unsuccessful, and the patient ultimately lost two teeth. The specialist wants to raise awareness of the consequences of oral piercings – he recommends that patients refrain from such piercings or remove existing ones in order to reduce the risk of complications affecting the teeth and periodontium. ■



Media History

From the Servant to the Server.

Who is in charge, the servant or the master? This age-old question is at the core of this cutting-edge media history which traces the transformation of the servant from the 17th century to this day. Though classic servants like the butler or the governess have largely vanished, the Internet is filled with servers: web, ftp, mail, and others perform their daily drudgery, going about their business noiselessly and unnoticed. Why then are current-day digital drudges called servers?

The author explores this question by going from the present back to the Baroque to study historical aspects of service through various perspectives, be it the servants' relationship to architecture or their function in literary or scientific contexts. At the intersection of media studies, cultural history, and literature, this work recounts the gradual transition of agency from human to nonhuman actors to show how the concept of the digital server stems from the classic role of the servant.

Markus Krajewski is professor of media history at the University of Basel. He is the author of numerous articles and several books, including *Paper Machines: About Cards and Catalogs, 1548–1929* and *World Projects: Global Information Before World War I,* which was awarded the 2007 Prize of the German Society for the History of Medicine, Science and Technology. ■

Markus Krajewski: The Server. A Media History from the Present to the Baroque, Translated and with an Introduction by Ilinca Iurascu, Yale University Press, 2018, 456 pages, USD 50.00

Politics

The Evolution of Resistance against Corruption.

Corruption undermines nearly all key legal and developmental priorities today. This book chronicles the global anticorruption steps taken since the movement advanced after the end of the Cold War. It provides a realistic assessment of the present state of affairs by critically evaluating what existing anticorruption programs and treaties have accomplished and documenting their shortcomings, while developing an action agenda for the next decade.

The authors argue that reformative action is imperative, and the forces of globalization and digital communication will level the playing field and erode the secrecy corruption requires. They define corruption, document its effects, discuss the initiatives that changed public perception, analyze the lessons learned, and then evaluate how to move forward with existing initiatives charting a new path with new, differentiated strategies.

In so doing, the authors not only capture the magnitude of corruption and the evolution of the resistance against it, they also reveal the personal lessons they learned while being at the heartbeat of the anti-corruption agenda.

Fritz Heimann is a founding member and senior advisor at Transparency International, and Mark Pieth is Professor of Criminal Law and Criminology at the University of Basel, Board of the Basel Institute on Governance. ■

Fritz Heimann and Mark Pieth: Confronting Corruption. Past Concerns, Present Challenges, and Future Strategies. Oxford University Press, 2018, 312 pages, GBP 28.99

German Modernism

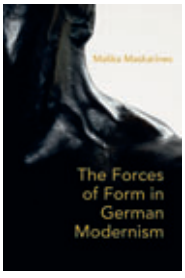
A History of Form and Force.

This fascinating account of German Modernism charts a modern history of form as emergent from force. Offering a provocative alternative to the imagery of crisis and estrangement that has preoccupied scholarship on modernism, the author shows that German modernism conceives of human bodies and aesthetic objects as shaped by a contest of conflicting and reciprocally intensifying forces: the force of gravity and a self-determining will to form.

Considering canonical artists such as Rodin and Klee, seminal authors such as Kafka and Döblin, and largely neglected thinkers in aesthetics and art history such as those associated with Empathy Aesthetics, Malika Maskarinec unpacks the manifold anthropological and aesthetic concerns and historical lineage embedded in the idea of form as the precarious achievement of uprightness.

The Forces of Form in German Modernism makes a decisive contribution to our understanding of modernism and to contemporary discussions about form, empathy, materiality, and human embodiment.

Malika Maskarinec is the managing director of eikones: Center for the Theory and History of the Image at the University of Basel. She is the co-editor of *Formbildung und Formbegriff: Das Formdenken der Moderne.* ■



Malika Maskarinec. The Forces of Form in German Modernism. Northwestern University Press, 2018, 240 pages, USD 34.95

“Self-optimization”: a scandalous type.

On a trendy term that even academia uses in an emotionalized and functionalized way – as happened with “Waldsterben” (forest dieback) some years ago.

Text:
Eberhard Wolff

In the 1980s, the concerned public in German-speaking countries believed that large parts of “our” forests would simply die off in the coming decades. The new German word “Waldsterben” to describe catastrophic forest dieback joined the ranks of “Angst” (deep anxiety or dread) and “Weltschmerz” (world-weariness) as a loanword in English and French. When the disaster failed to materialize, it was just what skeptics had been waiting for. Today, conservationists prefer to use more reserved phrasing, such as “new forms of forest damage”.

Now, for a scene change: A university janitor recently said to me in passing: “We still need to optimize the distribution of space.” Nowadays, it seems that everyone is talking about “optimization”. Derived from the Latin term for “the best”, the word “optimum” now refers to the best possible situation, the most favorable result in the given circumstances. However, because circumstances in everyday life are always open to debate, no one knows exactly what the optimum is. “There’s more we can do”, we might say colloquially. In such contexts, optimization is typically used to refer to something unspectacular. My computer “optimizes” at the end of a backup and describes the same process quite plainly as “cleaning up” in another menu – but “optimization” sounds trendier.

The term “optimum” only takes on a dramatic meaning if we interpret it to mean the maximum performance that can be achieved through existential effort. Then, “optimization” embodies the glittering chimera that is the promise of perfection, itself a (naive) utopia championed in the times of the Enlightenment. Today, advertising and coaching are the favored habitats of this optimization – of the fervent appeal to make “self-optimization” our aim in life. Too often, however, these industries earn their daily bread through empty promises or self-legitimizing platitudes rather than realism.

In stark contrast to positive “self-optimization”, the last few years have seen the concept evolve into a fashionable term of abuse in journalistic articles critiquing modern society. Here, the term refers to a race to the bottom rather than the pursuit of perfection. It is used to lambaste the adverse effects of an unchecked meritocracy, a society focused on competition and enhancement, where everyone must constantly strive for perfection: at work, in sport, in relationships, and in their appearance. Above all, the new tracking technologies that quantify and document our lives are seen as the epitome of self-optimization’s ills.

Such articles derive theoretical backing from a thought collective within the humanities that invokes Michel Foucault and exercises a certain discursive hegemony. Its proponents see self-optimization as a never-ending, extrinsic – and therefore governmental – form of compulsion by which modern societies coerce the individual to work “voluntarily” and relentlessly to improve themselves using technolo-

gies of the self, to strive for a goal that can never be achieved. Some of the researchers attribute this to post-Fordism or neoliberalism as the front to this drive – and point, specifically, to fitness apps. "Self-optimization" is the predominant model for interpreting modern phenomena such as the measuring and tracking of our own bodies and everyday lives.

Inasmuch as the concept of self-optimization could be useful in analyzing contemporary culture, the term has also been stripped of all nuance. For too long, I have searched in vain for authors who actually take the concept of self-optimization seriously. By that, I do not mean its rigid definition, but rather the objective efforts to explore its meaning and analytical scope. What interpretation of "optimum" – from which it is derived – does the term embody? The absolute best or the best possible outcome? In what circumstances? Where, how, and by whom is the optimum described? I suspect that there is no analytical interest in such questions. Optimization remains similarly undefined in the self-optimization of academia and can therefore be emotionalized and functionalized in the same way as the everyday cliché. Maybe the term is even deliberately used as a vague superlative because it sounds more sensational than mere "improvement". If the term were precisely defined and subjected to empirical analysis, it may well lose some of its notoriety as a dystopian – that is, anti-utopian – and never-ending concept, which serves to underpin a cultural pessimism and skepticism of technology that is sometimes subtle and sometimes explicit.

Max Weber drew a distinction between the "real type" and the "ideal type". The ideal type brings together the typical characteristics of a phenomenon in an extreme, exaggerated way. It creates a model to aid understanding. However, it must not be mistaken for a real type. Behind "self-optimization", I suspect, lies a third possibility, which could be described as a "scandalous type". This takes the developments presaged by the ideal type as a starting point and blends them with a current diagnosis based on extreme examples. The scandalous type is therefore the worst-case scenario transplanted onto the present situation. It causes the latter to seem, either subtly or explicitly, scandalous.

The scandalous type is fond of the deductive method. It is simultaneously a starting point and a preordained outcome. Selected examples confirm the assumptions. No thought is given to the possibility of falsification, nor is an attempt made to identify nuances, variants, alternative explanations or counterexamples. As a cultural anthropologist, I am fond of the opposite approach: the inductive method. This starts with an example. It asks questions and seeks out answers. The opposite is conceivable. Variants and alternatives are revealed by studying individual examples. The meanings and functions multiply. Those who use "self-optimization" as a sensationalist cliché evoke an extreme situation in which people unconditionally submit to the smartwatch on their wrist, quantifying and documenting everything, struggling from one personal best to another in a quest to emulate extrinsic ideals.

How many people do you know who actually adopt this puppet-like behavior, measuring every step, every calorie, every emotion, their pulse, blood pressure, and blood sugar level with a view to constantly bettering themselves? There may be a few cases. However, I know lots of people who have tried small self-tests using trackers and subsequently given up on them. They either get bored after a trial period or dismiss them as just a bit of fun. I also know people who use tracking productively from time to time and decide for themselves how seriously or lightly to take it. People who want to learn more about themselves, who want to engage with themselves – Foucault also had these people in mind with his concept of technologies of the self.

Thought collectives can facilitate or impede intellectual scrutiny in equal measure. For me, self-optimization has become a term that hampers understanding by resorting to "scandalmongering". It may well be just what the skeptics of critical self-optimization theory have been waiting for – exactly as once happened with "Waldsterben". ■

Eberhard Wolff has been Honorary Professor of Cultural Anthropology at the University of Basel since 2016. His work includes a complex interpretation of technologies of the self, based on examples such as self-help books, self-tests or blood-pressure measurements.

"How many people do you know who actually adopt this puppet-like behavior, measuring every step, every calorie, every emotion (…) with a view to constantly bettering themselves?"

Eberhard Wolff

History's biggest fan.

Text: Christoph Dieffenbacher Photo: Andreas Zimmermann

The shelves are crammed almost to bursting with volumes by Theodor Herzl, Siegfried Kracauer and Ernst Bloch. Every inch of the small office under the roof seems to be piled high with books, binders, stacks of paper, boxes and cases. In the midst of it all stands an open laptop. A sports calendar and a medal on the wall complete the scene. My host at the Center for Jewish Studies, accommodated in a Basel town house, is a tall, slender man in jeans and a black shirt. His voice is deep and sonorous; lively eyes peer out from behind black horn-rimmed glasses.

Sports clubs and the Middle East conflict

"Too little room for too many books," he quips with a hearty laugh. Erik Petry, who has lived in Basel for two decades, is well-liked by his students. Along with his open and accessible manner, this can undoubtedly be attributed to the topics of his lectures, seminars and excursions: Zionism, Jewish culture, refugee stories, Shoah and the Middle East conflict. His enthusiasm for these subjects is clearly contagious to many. "History is simply the best: Nothing could be more exciting," he says. It sounds convincing.

History, literature, music and refined language were held in high esteem in Petry's family. His father, a bookseller, read voraciously in his free time and spent his Sundays writing soccer bulletins – invariably accompanied by his wife and child. Petry's mother would knit scarves in the colors of his favorite club, and later on gave her son a Schalke 04 shirt that lasted for years, as Petry vividly recounts.

Consequential reading

Petry got into Jewish history and culture via a peculiar route. He can clearly remember the moment it all began, he says: At school, he was assigned an essay on the novella "Die Judenbuche" by Annette von Droste-Hülshoff, in which he had to discuss whether the Jew Aaron had deceived the village as a moneylender. From then on, his interest in Jewish history grew and grew, ultimately leading to extended research trips to Israel for his doctoral studies. In Israel he met fellow PhD students from Basel, and it was these encounters that led him to the university at the elbow of the Rhine, first for an exhibition project and later as an assistant.

Sports and Jewish remembrance culture are the topics closest to Petry's heart. His connection with sports dates back almost to his birth, he recalls with a laugh: "Six hours after I was born, I became a member of the VfL Kassel soccer club – and still am to this day." Until the age of 35, he played in various amateur clubs, and has volunteered as a coach and referee. Since moving to Basel – his current abode is a terraced house in the suburbs – he does judo and long-distance running, and completed the spectacular Jungfrau Marathon this year. He also goes jogging early every morning. He is a loyal spectator at FC Basel soccer matches, accompanied by his girlfriend and soccer-loving colleagues.

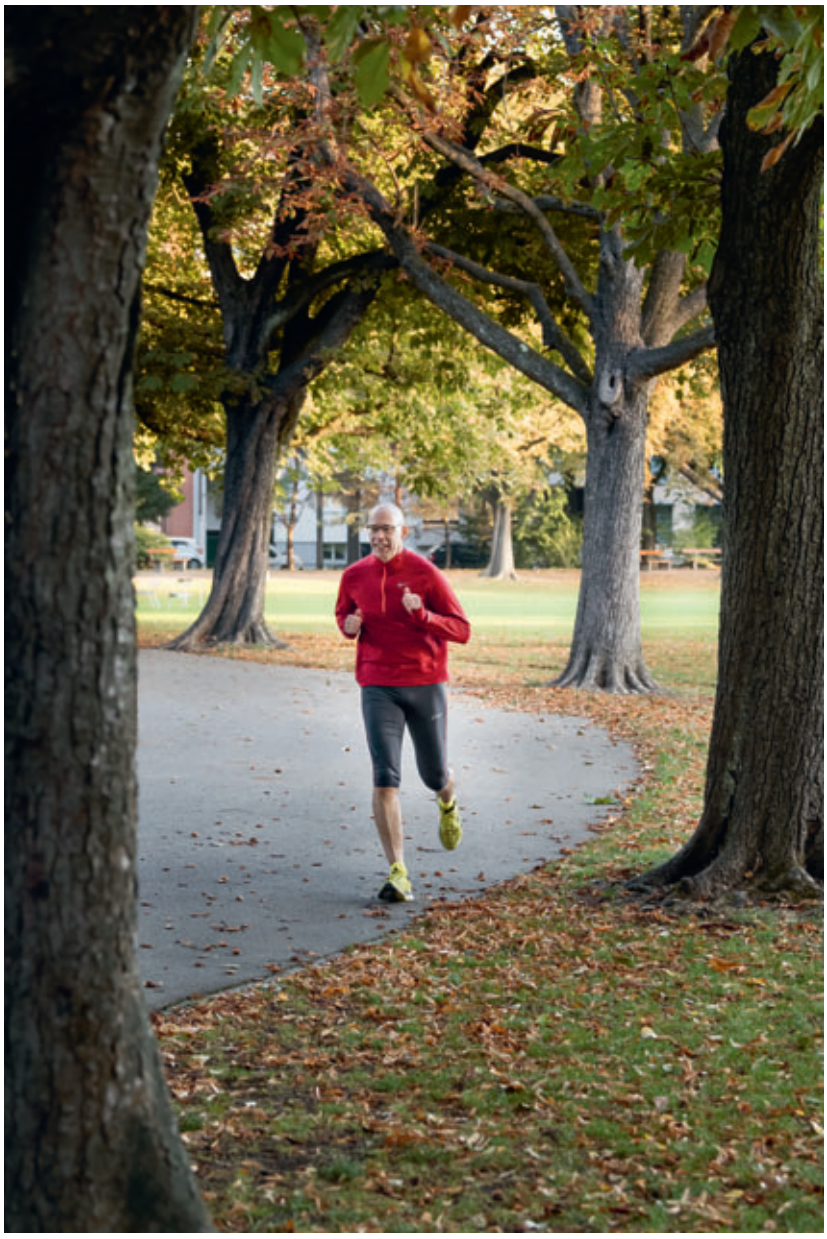
Sports and society

"Sports can tell us a great deal," says Petry. What context are sports played in? What role do they play for people? Who influences whom? "Sports reflect an entire society," says Petry, "and they play a part in how a society evolves, for example where the integration of foreigners is concerned." The historian often finds himself discussing sports and is frequently interviewed by the media on the subject. He notes that violence in soccer is not a new phenomenon: "Even in the game's earlier days, punch-ups at soccer matches were a common occurrence."

Although top-level sports are nowadays the object of highly professional marketing efforts, this has not diminished their appeal, Petry says, pointing out that commercialization is clearly no deterrent for most people. Nevertheless, scientific research in the field is virtually non-existent, he laments. For instance, Petry complains that the Swiss sports museum in Basel still struggles to find financial support – even though it is one of many institutions housing a wealth of material on the history of sports.

A Jewish society

Petry's postdoctoral habilitation thesis also touched on the topic of sports, albeit marginally. His research focused on a Jewish society formed by a group of friends in Zurich in the 1920s that endured for decades. Initially created as an opportunity for members to get together and play chess, the club survived until the death of its last surviving members this year. In the wake of World War II, the group named itself "the pack", deliberately adopting the expression used by Goebbels in his hate speeches. "The club worked like a lodge: Members helped each other their whole life long."



A researcher at the Center for Jewish Studies, Erik Petry is devoted to remembrance and making sure the past is not forgotten. His other great passion is sports – as an academic, as a fan and as an active participant.

Erik Petry
was born in 1961 in Kassel, Germany. He is Professor of Modern General and Jewish History, and Deputy Head of the Center for Jewish Studies at the University of Basel. After studying history and sports science in Göttingen and traveling to Israel on research trips, he obtained his doctorate in 1998 with a dissertation on early Zionism. He then moved to Basel, where he completed his postdoctoral habilitation in 2010 at the University of Basel.

A central aspect of the project was the concern – on the part of the pack's members and Petry himself – that an important piece of culture would be lost with the club's demise. Petry was able to talk to the last members in person. In the absence of written sources, he employed the oral history method, conducting and evaluating interviews. To establish trust, he spent a great deal of time in conversation with his subjects before even switching on the tape recorder. The thesis makes use of the concept of lifeworlds, in which the individual is placed at the forefront of the story.

University admin

Alongside his research and teaching, Petry has plenty of administrative and organizational work on his plate too: as the representative of a minor subject he is expected to participate in numerous university committees and boards. The upside is that this often means information reaches him faster, he claims. And he doesn't really have a problem with this kind of work in any case: "Working at a university is not exactly a nine-to-five kind of job," he says. He goes on to explain that he feels very much at home in Basel – thanks in no small part to the great interest in his field among the population.

What is more, anyone who has been at the Center for Jewish Studies since it was established 20 years ago – as Petry has – knows their way around, he says, before turning back to his laptop, nestled among books and piles of paper, to continue working on the article he was busy with when I came in. ■

Alumnus at work: Arkaprabha Sarangi

From India via Basel to NASA.

Text: Bettina Volz-Tobler

Arkaprabha Sarangi is a research associate at the NASA Goddard Space Flight Center in Greenbelt, Maryland, USA. While growing up in India, he developed a keen interest in all physical sciences. His passion for astrophysics eventually led him to move to Basel to pursue a PhD. From here, it was only a short hop to NASA.

Arkaprabha Sarangi

UNI NOVA: What motivated you to pursue your PhD at the University of Basel?
SARANGI: Nuclear physics and astrophysics were my favorite topics during my master studies in India. At the time, I learned of the nuclear astrophysics group in Basel, which is a very active and reputed group. My future PhD supervisor Dr. Isabelle Cherchneff had just started an international research project called CoDustMas, which was funded by the European Science Foundation. She was looking for PhD candidates, and I was very fortunate to be selected.
UNI NOVA: Today you work for the NASA. How did you land this job?
SARANGI: I am a research associate at NASA GSFC in the Observational Cosmology Lab, in the Astrophysics Science Division. I am working with Dr. Eli Dwek, who is a world-renowned scientist in the field of infrared astronomy and also a member of the COBE project, which won the Nobel Prize in Physics in 2006. Due to our overlapping research interests, Eli was one of my mentors during my PhD studies in Basel. After graduation, I started working with him and won a NASA Astrophysics Theory Grant.
UNI NOVA: What are you working on there?
SARANGI: My field of study is cosmic dust, which are solid chemical compounds found in space in different compositions and morphologies. Importantly, they are the building blocks of planets, so, for example, everything we see on earth, including human beings are made up of materials which were in the form of space dust at some point in the past. My primary research goal is to find the origin of cosmic dust.
UNI NOVA: Looking back, what was your most memorable experience in Basel?
SARANGI: When I moved to Basel in 2010, I was traveling to a place 7500 Kilometers away from my hometown. I did not know the language, nor did I have any savings in the bank, as I was just out of college. Everyone I met at the university was very kind and welcoming from the first day on. Academically, I learnt from my adviser how to tackle complex scientific questions, which is indispensable for the career of a scientist. I owe a lot to her for all my success today.
UNI NOVA: How would you characterize the spirit of the Physics Department?
SARANGI: It comprises a very productive and successful group of scientists. The mutual appreciation of each other's work was something that I learnt to value during my time here. I received a lot of encouragement from all members of the group, which has motivated me to pursue research at the highest level. ■

Dr. Ivan Giangreco

AlumniComputerScience

New alumni association created.

Text:
Bettina Volz-Tobler

The University of Basel's degree program in computer science was launched in 2003. Fifteen years on, the alumni association AlumniComputerScience has been formed.

The new group was created to bring together the growing number of former students and doctoral researchers candidates at the University of Basel under the umbrella of AlumniBasel, and to cultivate and promote communication – both among the alumni, and with their alma mater. The faculty-specific group will facilitate networking between alumni and the Department of Computer Science with a variety of events, and of course through sharing of knowledge and information.

Postdoc leads the way

The driving force behind the new group, which sprang into being in the course of this year, is the postdoc Dr. Ivan Giangreco. As a young graduate, he recognized the value of keeping in touch with former fellow students and the department itself, and enthusiastically set about establishing the AlumniComputerScience group at the University of Basel. Besides Giangreco, the alumni board includes Professor Heiko Schuldt, a professor at the Department of Mathematics and Computer Science, and Dr. Heike Freiberger, program coordinator at the same department.

Giangreco works on various projects at the computer science department in the Databases and Information Systems research group. One of the projects he is involved in is IMOTION, devoted to researching and developing innovative methods for searching extensive image or video collections. The project tackles the problem of how to locate a multimedia file if you can only remember fragments of it. Potential applications of the project's findings include creating a multimedia historical record of the city of Basel, assisting historians searching for watermarks, or filtering news videos according to particular movement patterns.

Interdisciplinary nature

Computer science is a young field at the intersection between mathematics, engineering and the natural sciences. It is interdisciplinary by nature, and deals with the analysis, processing, storage, transmission, representation and use of information from a scientific and technical standpoint. It will be exciting to reconnect with the alumni of this department, now working in a wide variety of fields.

In 2010, the mathematics and computer science departments were merged to form a single department comprising 14 professorships. As a result of this process, the Institute of Mathematics, with its centuries of tradition, and the young, burgeoning Department of Computer Science were combined into a single organizational unit. In early 2015, the department moved from its previous five locations to a new joint home at Spiegelgasse 1/5. The new premises are equipped with workstations, seminar rooms, study facilities, computer labs, and a library. ■

Laurenz Foundation

Cooperation with Schaulager.

Since 2002, the Laurenz Foundation has funded the Laurenz Assistant Professorship for Contemporary Art at the University of Basel, an arrangement that has proven to be a huge success. The Schaulager, run by the same foundation, is at once a public museum, an art storage facility, and an art research institute. AlumniBasel regularly informs its members in the field of art history on current events and symposiums. ■

Event

For young professionals.

Both our private and professional life can benefit immensely from a good network – but this network does have to be built up and maintained. On 15 November, AlumniBasel, VBÖ and VERSO Bar (formerly skubar) will launch a new format giving alumni the opportunity to make connections and stay in touch after graduating. To help get things going, a business speed networking event will be held, followed by a short speech and a drinks reception. Places are limited. Register and find out more at: www.alumnibasel.ch. ■

2018 hiking weekend

Breathing in the Davos air.

This year's AlumniBasel hiking weekend boasted the participation of an honorary doctor. After a tour of the Davos Hochgebirgsklinik, the group made its way along Lake Davos to the Grialetsch hut. A wealth of information on the local geology was supplied by Dr. Christoph Wehrli, formerly a long-time researcher at the Davos Physical-Meteorological Observatory. Also in the group was Wehrli's wife, the translator Irma Wehrli-Rudin, who was awarded an honorary doctorate by the University of Basel's Faculty of Humanities and Social Sciences in 2017. ■

Book publication

"Gallus, der Fremde" (Gall, the stranger) – novel.

Gall has been living in the wilds of the Steinach valley for more than 20 years when one day a stranger appears. Her questions force the truculent hermit to recall events from his past life: his perilous journey, around 590 AD, with a group of wandering monks from Ireland to the Vosges mountains and then on to Lake Constance, their violent attempts to convert the people of Tuggen and Bregenz, and, above all, the split from his teacher and long-time companion, Columbanus.

In her new novel, Gabrielle Alioth retraces the life story of the eponymous founder of St Gallen, as recorded in the vitae. However, she also explores the constraints and desires that shaped the life of this voluntary exile and dropout from society in the early 7th century. "I find Gall's fate fascinating and moving," says Alioth, herself an emigrant from Basel to Ireland. "I would love to know what it meant for this not-so-saintly saint to leave his homeland, and why, after almost 30 years, he rebelled against Columbanus and split from him."

The novel gives the author an opportunity to put these questions to Gall. "I stick to the facts, in so far as we know them. However, unlike a historian, I have the freedom, as a writer, to use fiction to fill in the gaps between the facts." Gallus's story is echoed in the life of the foreign visitor, who, at the end of the 20th century, finds a home in Ireland only to lose it once again. "The past," Alioth says, "is always a function of the present. By engaging with it, we learn not only something about what it was like then, but, above all, something about today."

Gabrielle Alioth was born in Basel, studied economics at Basel University and has been living in Ireland as a freelance writer since 1984. Since 2010, she has been running "Schreiblust", an annual writers' weekend organized by AlumniBasel in partnership with Literaturhaus Basel, where people with an interest in writing spend two days writing and discussing their own texts. ■

Gallus, der Fremde
(Gallus, the stranger)
Novel by Gabrielle Alioth
Lenos Verlag, Basel 2018
ca. 250 pages, CHF 29.80

Letter from Cairo

Eventful times at the Nile.

Astrid Frefel spent several years as a business journalist for Swiss daily newspapers after graduating, before taking up a position as a foreign correspondent for central and eastern Europe in Vienna. After seven years in Vienna, her job then took her to Istanbul and finally to Cairo, where she has been reporting for various media outlets in Switzerland, Germany and Austria.

I ended up in Cairo more by chance than by design. After Vienna and Istanbul, "Umm al-Dunya" (the mother of the world), as this mega-metropolis of 20 million likes to call itself, was my third assignment as a foreign correspondent. I had been interested in the Middle East for some time, learning Arabic out of curiosity and traveling in the region. After my time in Istanbul, Cairo was no great leap. I got into journalism as soon as I finished studying economics in Basel, majoring in economic policy.

People often associate Egypt with archaeology and the colorful history of the Pharaohs. However, my focus has always been on observing the political, social and economic developments in this third world country. The exotic culture and the extreme contrasts in many areas of life – between rich and poor, between those with access to education and those without, between town and country – are a rich source of material for many fascinating topics.

What is more, Cairo is the perfect location from which to report on much of the Arab world. My first few years there were relatively uneventful. "Stability" was the catchphrase of long-time ruler Hosni Mubarak, until revolts in the spring of 2011 – primarily driven by younger generations – culminated in the regime's downfall. The tumultuous years that followed brought instability, political violence and economic strife, the latter exacerbated by a sharp decline in foreign tourism and investment.

The election of former army chief Abdel Fattah al-Sisi as president in 2014 marked the beginning of a new era in Egypt. "Stability" is once again the top priority, pursued with every means available. Critical voices have for the most part faded away; people are above all exhausted by the struggles of everyday life. Following drastic economic reforms in November 2016, the Egyptian pound lost half its value compared to the US dollar. These are not easy times for foreign correspondents in Cairo, who are expected to follow official reporting guidelines to the letter, stick solely to positive news coverage, and refrain from shining a critical light on the government's activities. Another noticeable change is that far fewer foreigners live in Cairo after the turmoil of recent years. For the first time in all the years I have been here, I feel I am something of an oddity – hardly the best conditions for making long-term plans. ■

Observing the political, social and economic changes: foreign correspondent Astrid Frefel in Cairo.

Anne Spang has been Professor of Biochemistry and Cell Biology at the University of Basel's Biozentrum since 2005. In her research, she is investigating the principles of intracellular organization, including molecular transport processes for proteins and messenger RNA.

Photo: Andreas Zimmermann

Anne Spang

Goethe's "Faust": a dangerous pact with the Devil.

"Publications earn you funding and a good reputation, which many researchers equate with happiness in life."

Goethe's *Faust* has been my companion since high school, where it was compulsory reading. My copy also goes back to my school days; it is a small, yellow Reclam volume, worn, well thumbed, and with annotations – not just on the text – by my two older brothers. However, what matters is content, rather than appearances. For me, "my Faust" is less about particular passages than about emotions.

My drive and energy are summed up well in the lines, "That I may detect the inmost force / Which binds the world, and guides its course". I want to understand things, and I can identify with Faust and his aspirations. On the path to knowledge, there are sideshows, lucky breaks and obstacles that do not necessarily have anything to do with your abilities. To put your own ideas into practice in science, you have to be successful. First, you need very good grades, so that you can study with the best, and then you need excellent publications. These earn you funding and a good reputation, which many researchers equate with happiness in life. This is the kind of dilemma in which Faust, too, finds himself : "I've studied now Philosophy / And Jurisprudence, Medicine, – / And even, alas! Theology, – / From end to end, with labor keen; / And here, poor fool! with all my lore / I stand, no wiser than before." He wants a great deal, but cannot get ahead; he seeks happiness in life, so he makes a pact with the Devil. The pact with the Devil that, fortunately, only a very small number of researchers make is to betray science by, for instance, falsifying data, so that they can get published more easily and more quickly. The magic potion that restores their youth, in this case, is publications in prestigious journals. This makes it more tempting for young, ambitious researchers to allow themselves to be led astray and to work in an unethical way. However, it always comes to light at some point!

For me, *Faust* is a constant reminder of the need to uphold scientific integrity and never to go off track – especially at times when my experiments have not always worked, but today as well. I encourage young scientists to work ethically and try to set an example of integrity. That is part of happiness in life for me – without making a pact with the Devil. ■

unibas.ch/aktuell

A selection of events. November 2018 – May 2019

November 19–20

Basel Convention on Philanthropy

International speakers from the NPO sector, politics, research, and business will come together to address the diversity and future challenges of philanthropy.

philanthropyconvention.org

Volkshaus Basel, Rebgasse 12–14, 4058 Basel

November 22, 6 pm

Distance, Difference and Reverie: Encountering Transmission Ecologies Through Radio Art

Lecture by Anna Friz, Assistant Professor of Sound at University of California Santa Cruz

Museum Tinguely, Paul Sacher-Anlage 2, Basel

November 27–28

Climate Science & Ancient History: Decoding "Natural" and "Human" Archives

The interaction between climate change, environmental stress, and socio-political systems is increasingly attracting interest, as contemporary concerns about global warming grow. The conference brings together ancient historians and climate scientists and bridges the traditional gap between the natural sciences and the humanities.

University of Basel, Kollegienhaus, Regenzzimmer 111, Petersplatz 1, Basel

December 4, 6.15–8 pm

Different local responses to the Black Death: A comparison of wages and prices across the Mediterranean cities in the late Middle Age

Lecture by Mattia Fochesato, Max Geldner Assistant Professor at the Faculty of Business and Economics, University of Basel

University of Basel, Kollegienhaus, Lecture hall 001, Petersplatz 1, Basel

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December 5, 6 pm

Living in New Atlantis: How do we talk about the Baconian project as it moves toward transhumanism?

Lecture by Jon Turney, UK-based science writer and author

University of Basel, Kollegienhaus, Lecture hall 115, Petersplatz 1, Basel

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December 6–7

One Health for Humans and Animals – How Do We Get Zoonoses under Control?

More than 60 percent of human infectious diseases have animal origin. The Swiss TPH Winter-Symposium explores the causes and responses to animal-human transmission.

Parterre Rialto, Birsigstrasse 45, Basel

December 13, 6–8 pm

Post-Cinematic Prometheus: From Frankenstein to Ex Machina

Lecture by Shane Denson, Assistant Professor of Film and Media Studies in the Department of Art & Art History at Stanford University

University of Basel, Kollegienhaus, Lecture hall 115, Petersplatz 1, Basel

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January 18, 6 pm–2 am

Basel Museums Night

Why not take a nocturnal stroll and buy a single ticket that gives you access to around 200 events in 36 museums and cultural institutions in the Basel region? The manifold program also provides access to three museum collections of the University of Basel.

museumsnacht.ch

February 6

Cinema Evening: Science Film-Hackathon "Exposure"

Exposure Science Film-Hackathon is a project that trains young scientists in science communication using the medium of filmmaking. During three-day hackathons scientists team up with artists to learn, explore and innovate science communication. At the cinema evening the resulting films are presented to the public. The audience can vote for their favorite film and engage with the scientists and participants.

exposurehackathon.com

KultKino, Clarastrasse 48, Basel

April 27–June 1

Inside Motion. Medicine in the Fourth Dimension Exhibition

For centuries, philosophers and scientists longed to see what a living human body looks like from the inside. Today, with the help of advanced imaging methods, researchers of the Department of Biomedical Engineering at the University of Basel are making this possible with technologies such as virtual and augmented reality for diagnosis, surgery planning, and patient communication. The exhibition invites visitors to swap places with surgeons inside a virtual operation theatre and to learn about organ motion, real time tracking and new treatment measures. The exhibition, generously funded by the Swiss National Science Foundation, is designed in cooperation with media artists and designers of the Academy of Art and Design Basel.

Pharmaziemuseum, Totengässlein 3, Basel

May 3–5

Science + Fiction Festival

Science meets culture and entertainment: this three-day festival guarantees a fresh perspective on current issues – because science concerns us all.

scienceandfiction.ch

Sommercasino, Münchensteinerstrasse 1, Basel

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