Portal Wissen

The Research Magazine of the University of Potsdam

One 2014

BELIEVE

The Photographer of “Believe”

The cover photo and the pictures introducing the five themed sections of the magazine were taken by Nick Ash.

Every time I take the time to look at the world through a camera I’m initially confronted with spaces and objects that I know and can name. A house. A car. A plastic bag picked up by the wind and slowly drifting across a street. It always takes time and concentration and focus to start really seeing what is framed in the viewer. Spatial compositions, with luck, emerge and become apparent not unlike the sensation of approaching an object in fog. And what role does belief play in this practice? The belief is held that this transformation in perception will eventually arrive and provide a space where pictures can be made.

THE PHOTOGRAPHER

Nick Ash lives and works in Berlin as a photographer and university teacher. He teaches art at the Teacher Training Department of the University. His educational field of interest lies in aesthetical art education and in particular the role that a visually based ethnographical approach can support and further research in this field.

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Photo: Ash, Nick

Dear Readers,

People want to know what is real. Children enjoy listening to a story but when my children were about four years old they started asking whether the story really happened or was just invented. Likewise, only on a higher level, our academic curiosity is fuelled by our interest in knowing what is real. When we analyze poetic texts or dreams we are trying to distinguish between the facts (e.g. neurological ones or linguistic structures) and merely assumed influences. Ideally we can present results that were logically understood by others and that we can repeat empirically. But in most cases this is not possible. We cannot read every book and cannot look through every microscope, not even within our own discipline. In the world we live in we depend on trusting the information of others, like how to get to the train station or what the weather is like in Ulaanbataar. This is why we are used to believing others, our friends or the news anchors. This is not a childish behavior but a necessity. Of course, it is risky because they could all be lying to us, like in a Truman Show situation. The only time we are able to

know that we are in reality is when we transcend our self-consciousness and when we accept two propositions: first, that we are not only objects but also subjects in the consciousness of others and second that our dialogic relations are again observed by a third party that is not part of this inter-subjective world.

For religious people this is "belief" - belief as the assumption that all human relations only become real, serious and beyond any doubt if they know they are under the eyes of God. Only before Him something is in itself and not only "for me" or "among us". That is why biblical language distinguishes between three forms of belief: the relationship with the world of things ("to believe that"), the relationship to the world of subjects ("to believe somebody") and the assumption of a subjective supernatural reality ("to believe in" or "faith"). From an academic point of view belief is a holistic hypothesis. Belief is not the opposite of knowledge but it is the attempt to save reality from doubt by comprehending the fragile empirical world as an expression of a stable transcendent world.

When I talk to students they often ask not only about what I know but what I believe. As a professor for Religious Studies and a believing Catholic I am caught in the middle. On the one hand, it is my duty as a professor to doubt everything, i.e. to attribute each religious text to its historical context and sociological functions. On the other hand, I, as a Christian, consider certain religious documents, in my case the Bible, an interpretable but nevertheless irreversible, revealed text about the origin of reality. On weekdays the New Testament is a collection of ancient writings among many others, on Sundays it is the revelation. You can make a clear distinction between these two perspectives but it is difficult to decide whether doubt or belief is more real.

This issue of "Portal Wissen" explores this dual relationship of belief. What is the attitude of science towards belief – is it a religious one? Where does science bring things to light that we can hardly believe or that make us believe (again)? What happens if research clears up erroneous assumptions or myths? Is science able to investigate things that are convincing but inexplicable? How can it maintain its credibility and develop even so?

These questions appear again and again in the contributions of this "Portal Wissen". They form a manifold, exciting and surprising picture of the research projects and academics at the University of Potsdam. Believe me, it will be an enjoyable read.

PROF. JOHANN HAFNER
PROFESSOR OF RELIGIOUS STUDIES WITH FOCUS ON CHRISTIANITY
DEAN OF THE FACULTY OF ARTS

Photo: Roese, Thomas

Believe

Glauben

Unbelievable

Unglaublich

Misconception

Irrglaube

Credible

Glaubwürdig

Verify

Beglaubigen

Imprint

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BELIEVE

Glauben

Photo: Ash, Nick

What You Believe

An Interview about the Relationship between Belief and Science

What is belief? – Is it religion? Or is it a conviction that can get its orientation from other values? Prof. Johann Hafner, a professor of religious studies, and philosopher Prof. Hans-Peter Krüger have tried to define the essence of belief for "Portal Wissen".

Mr. Hafner, belief and religion are often used as synonyms? Are they?

HAFNER: Religion is commonly referred to as the objective cultural expression of believers. We might also describe belief as the religiousness of the individual. Only in Christianity did belief and religion become identical because it often functions as a confessional religion. This means that you represent a certain belief that is at the same time the content and form of religion. On the other hand, there are shamanistic religions that completely consist of rituals and not of religious creeds.

Mr. Krüger, would you as a philosopher define belief differently?

KRÜGER: In philosophy we extend the discussion about religion to a discussion about the religious. It is not bound to an objective institutionalized religion anymore. Of course, this is connected with the increasing individualizing of religious convictions in modern society, the process of secularization. In this respect, the religious and forms of belief meld. Belief, for example in nature and reason, does not have to be religious. I think this because all people enter into a relationship with an indefiniteness during their lives. You do not stand above your own way of living and can never completely rationalize it. You therefore need an approach towards that which you might encounter in life as a whole, which always involves an element of belief, if you cannot fully rationalize it.

HAFNER: Indeed, there are also extreme positions within the Christian traditions, like the one of the theologian Karl Barth. He defined, "Religion is unbelief". His contention was

Prof. Johann Hafner.

Prof. Hans-Peter Krüger.

Photos: Roese, Thomas

Photo: Roese,Thomas

that people who want to be religious actually only do what everyone else would do, that is to mix some wise sayings or practices to better master their everyday problems. To him, religion is only an enhanced form of mastering life, in this case by spiritual means and thus the project of the profane and unbelieving. According to Barth, real faith means adopting a revelation made long ago and placing your life under the judgment of a higher authority.

Is there a belief without religion?

HAFNER: I don't think so. Just as a private language cannot exist because I need a social community from whom I can learn the grammar. A language intelligible to me alone would just be noises like "bli, bla, blu" and would not be a "language". A belief independent of religious traditions could not be distinguished from poetry, arbitrariness or even madness.

KRÜGER: For me there are forms of belief that are not religious. However, I also understand them as collective forms of belief, for instance various forms of acceptance that nature-as-a-whole transcends the human world. And there is also the recognition of transcendence in a non-religious sense, in this case nature-as-transcendence. You can live that subjectively without necessarily understanding it as a religion. On the other hand, I think it is possible for religion to work without belief, but this would be rather superstition caught up in fetishes. We could continue with a big philosophical discussion about the premodern cultures of the Axial Age. Their common element was the introduction of an authority of judgment exceeding human life in the here and now. This can be reason, in the sense of a higher reason that Plato explained purely philosophically. However, it can be religious too in the way we know the world religions we are familiar with.

HAFNER: Perhaps it is the origin of the religious when people are required to take an observer's position that is beyond their empirical biography, in other words not just to ask, "What is the here and now good for?", but to ask, "What do I have to do to manage my life as a whole?" This is not an empirical but a transcendental act. Furthermore, the observation and assessment of ourselves must not happen according to criteria we give ourselves. Otherwise we arouse suspicion of mere self-assurance. To achieve this, religions use the terms God, Dharma, Law. An authority formulates criteria that regulate, calm or relieve my life.

Could we say that the difference between religious and philosophical belief is that the standards for philosophical belief are not fixed to the same extent as in religious belief?

KRÜGER: This is different when it comes to reason. There are closed systems, for instance the Platonic tradition, but there are also open concepts of reason, like the Aristotelian or Epicurean. This repeats itself in modern times. You find an open conception of reason with Kant. Agnosticism – acknowledging the unknowability of the thing itself – is also a gesture of stepping outside the hermeneutic circle. With Hegel we again have the absolute self-empowerment of reason in the system.

HAFNER: ... which also exists in religion. There are religions that do not consider their traditions upon which they are grounded. They claim to go back to the original text and to read the "Holy Bible" and to pray the "True Gospel of God". When someone disregards 2,000 years of church his-

tory and at the same time regards schisms, the alliances with philosophy or divorces from culture as irrelevant and goes back to an "uncontaminated origin" – namely the 150 pages of the New Testament or the Torah as allegedly written down by Moses – well, then this is a quite modern phenomenon, but we consider it pre-modern or fundamentalist. As there are open conceptions of reason, there are also open religions that accept the existence of an interpreting history of their own canonized texts, whether this is done by councils of the Orthodox, the magisterium of the Catholic or the sola fide of Protestant believers. The initial revelation is made more "fluid" by additional revelations for the respective period.

Mr. Krüger, what is the difference between the belief in reason you described and the religious belief outlined by Mr. Hafner?

KRÜGER: This is a difficult question. I think when we determine whether something is religious, we have to consider the self-conception of those involved. In philosophies of reason there are functional equivalents to God in religion. But when they say to themselves: "We can explain philosophically, by dialectical forms of negation, how the last substance produced itself out of itself, and we do not need to believe in god for this", it is a form of rationalization. I take such information seriously: "We do not understand ourselves as religious".

HAFNER: I think what really unites us is that we discover cultures both in philosophy and in religion that use the concept of transcendence, i.e. something that exceeds human nature or a person...

KRÜGER: ... these would be the axial cultures ...

HAFNER: ... yes. And this could be non-religious. But I think it is characteristic of the religious mindset when you say: The transcendence is not only a higher logic, like a universal law that is true and takes place in an adamant logic but that it contains a tendency towards the better. The religious trust that this universal law, this transcendence pursues the good. Then I can worship it. Religions believe that this higher reason has an interest in them and that the broken and unfinished will be healed and made complete. In my opinion, this is the religious added value over metaphysics.

KRÜGER: Yes, this is true when we speak about the world religions that emerged from the axial cultures. They all follow the model of a personal alliance. In other words, the logos becomes personal-

Photo: Roese, Thomas

ized into a god, and there is an alliance between the believers and god. This tips the scales toward the good. Such a certainty does not exist in philosophy.

What about the gods of the Greek myths? They did not only want good things for the people...

HAFNER: This is correct. For the most part, the gods in the Hesiodic, Homeric and later in the Roman pantheon are immoral. This is exactly why it was assumed that there is a law that keeps the struggles and generations of gods together or punishes them. It is something that bothered the Greek and Roman religions: Tyche, Fortuna, Fate. This was anonymous, however. Anyway, these immoral stories were a sore spot for Greek philosophers. They either commented on them ironically or interpreted them allegorically.

Today the difference between philosophical and religious belief has again been eroded...

HAFNER: Well, I would even say a major part of philosophy is religion. Plato, Hegel – these are all religious undertakings. Aristotle ...

KRÜGER: ... Well, this goes too far for me, of course. We could probably say that there was a religious dimension ...

HAFNER: Perhaps, I'll dare to give a basal definition: Religion is everything when and where people anticipate the existence of a second world. Simply put: A second world that reflects our world, incorporates ours, corrects and unsettles it. The presence of any gods plays no role in the first place, but this world leads to our uncertainty because we perceive ourselves in our contingency.

KRÜGER: This again is the core of all axial cultures and not the specific nature of religion. The same is possible when you proceed from cosmos and logos, the uncertainty of earthly and human life. I think the main difference is something else. Religions really need a liturgy, a sensual-aesthetic practice. They need a church service, and philosophers do not. They need an academy where they can discuss and where they can hold their symposia. An aesthetic church service with a strict liturgy that establishes assurance of faith and feelings of security in this world would not be necessary. I think this is a behavioral exercise, this whole liturgy that we do not have in philosophy because there you have to remain open for a dialogue. This is a different culture. In this way you are also able to question more than in religion. In this respect there has always been a conflict between philosophy and religion. Theologians did not like Hegel because he rationalized away their theology ...

HAFNER: Stop! Hegel said: Any kind of philosophy is religion because it expresses the speculative ...

KRÜGER: Yes ... Religion is the lowest form. It is the most sensual form of reason for the masses. This is the bridge. Philosophy provides the complete rationalization of the absolute. It no longer needs a liturgy. It needs the university, the reformed university of the Humboldtian model that we have abolished throughout Germany but that was copied worldwide from the USA to Japan. This was Hegel's message.

Mr. Krüger, religion and philosophy have been interwoven throughout history. How and why did they separate?

KRÜGER: The main difference lies in the fact that there is a sensual and emotional practice in religion guaranteeing the certainty of faith while philosophy is always connected to discursive procedures containing a high potential of negation and are thus unstable. This difference has developed historically.

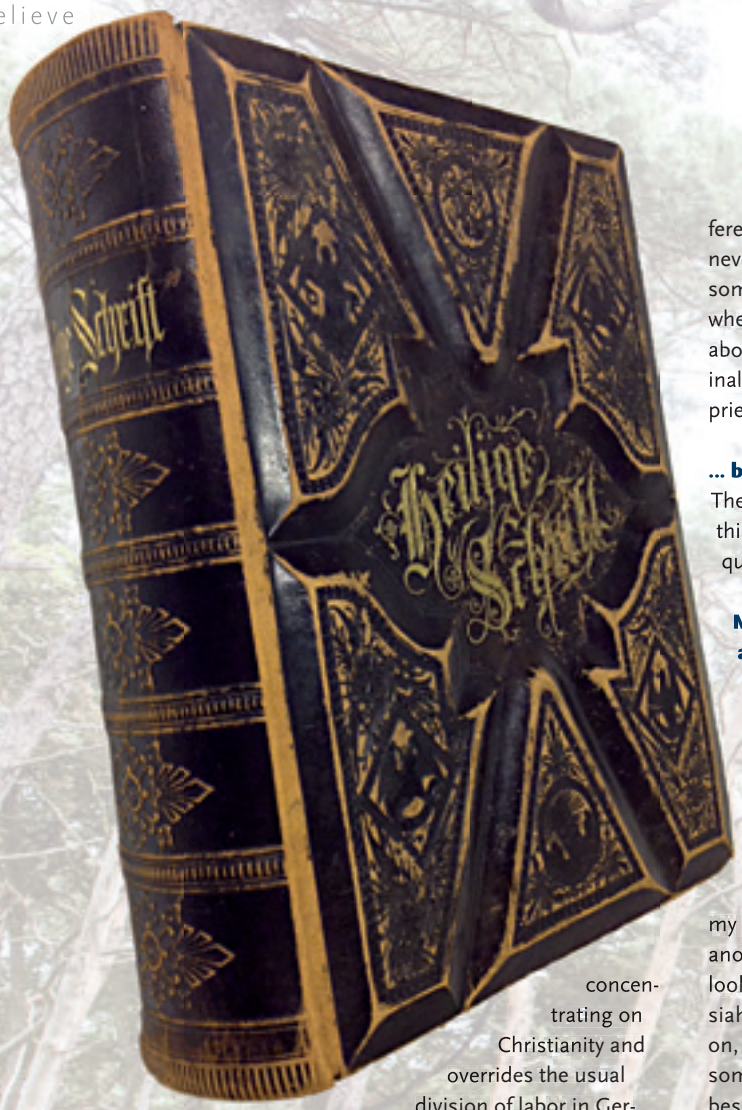
Why did this philosophical way of thinking and living come into being in the first place?

KRÜGER: The axial cultures came into being in conflict zones of different societies and cultures where war had been waged and people had migrated for centuries. This means that the Greek city-states had trade and war relations with the whole world and could make cultural comparisons. This leads to cultural and technical developments but also to philosophical ones. Religion emerged out of similar conflictual situations, for example in Judaism with the Exodus out of Egypt. These conflicts were about life and death. There was also the question of how to establish a long-term life perspective for one's own group.

What is the task of philosophy today? Does it give a completely different life orientation to people than religion?

KRÜGER: I think philosophy and religion still have commonalities. Philosophy also wants to gain a long-term perspective about how we fit into the cosmos and the necessary pre-conditions for this. This is the commonality – to go beyond the here and now. However, philosophy constructs it with discursive means. A central issue is the discussion of empirical science, cultural studies and social sciences.

Photo: pixelio.de/Christina Maderthoner



Mr. Hafner, what do you think of religion?
HAFNER: [laughs] Well, you have to address me more exactly. Are you asking the professor of religious studies, the deacon or the private person? I am a practicing Catholic. I am a layman who attends church services as well as someone who ministers, a deacon of ten years who prays, marries and buries..

Has your religious affiliation ever been of any relevance during your academic career?
HAFNER: No, it hasn't. When I was appointed I had not yet become a deacon. A special aspect of the professorship is that it deals with religious studies concentrating on Christianity and overrides the usual division of labor in Germany, i.e. that scholars of religion mainly deal with non-European and esoteric aspects and theologians with Christianity. Here they said they needed someone who could contribute an external perspective on Christianity without being exclusively committed to theology. At the same time the person was supposed to have "rubbed shoulders" with Christianity and would be able to present the Christian religious traditions from inside.

What role does your belief play for your work as an academic?
HAFNER: Well, I studied theology, did my doctorate in philosophy and habilitated in religious sociology. It was a stroll through different disciplines. I have never left the church, which sometimes seems likely when you get to know more about church history. I originally wanted to become a priest...

... but?
Then I met my wife, and this issue was settled quickly.

Mr. Hafner, you are an academic and a Catholic. Do you sometimes stand in your own way, for example when critically reading Catholic texts?
HAFNER: Others have to judge whether one of my roles contaminates another. As an academic, I look at an issue, e.g. "Messiah", "Pilgrimage" and so on, and then always put something non-European beside it in my lectures to show there are religions that solve the same problem differently or a different problem similarly. This means there is always a fixed initial point, Christianity, from which I examine other religions. There is, however, a trend toward a general religious theory, in which other religions form only a part. This does not mean that I integrate other religions into Christianity but realize that Christianity is part of a bigger religious history. The longer I read and teach, the more I understand that there are some basic problems all religions deal with again and again: the problem of irreversibility, no matter whether it is of life, death, of our actions or guilt.

And does this not shake or relativize your faith?
HAFNER: If tomorrow I found a religion more logical than the Christian one, I would convert immediately. This is completely clear to me.

KRÜGER: There is nothing more logical than Catholicism. At least he can say this very calmly.

And you, Mr. Krüger, what do you believe in?
KRÜGER: I was brought up in an Evangelical family and received an atheist education at school. Since high school the solution of this conflict for me has been Herder, Lessing, and Jacobi: Pantheism. Deus sive natura. When you have read these three you are often surprised about the conflicts between atheists and Christians. Like in Lessing's Nathan the Wise you keep your distance and say that the ring distinguishing one religion does not exist anyway. The competition between the various religions for better human existence is the most important. I am still a pantheist today. When travelling to China or Japan, though, I have been slightly disturbed by Zen Buddhism. I had to realize that I am already a bit too old to adopt a new form of religion. I am mentally not as well structured as Mr. Hafner. I could not play a second role in practice. I would confuse it with my role as a philosopher.

It is said that the motor of philosophy is doubt. Mr. Krüger, aren't you sometimes afflicted by the fact

Photos: 12/13, 12 (top) Fritze, Karla

that basically everything can become uncertain for a philosopher?

KRÜGER: No, because I think that uncertainty can also contain an opportunity. I try to open all forms of negativity and keep them free from one-sided assessment. Uncertainty, the infinite, the unconditional are negative determinations that you can neutralize. This is something religion cannot do because it wants to give security. In philosophy you have to neutralize and uncover phenomena and structures indiscriminately against a one-sided attachment to values. So there is first a curiosity for knowledge and recklessness with regard to our own life. In philosophy you have to question, to challenge everything, even things society takes for granted, like your country's constitution.

What does it mean for you that we live in a secular state with a separation of religion and politics? Should and can the state remain a neutral mediator between religions and between believers and atheists?

HAFNER: I would say the secular state is a great blessing – if I may use that word – for religions. Only through it did religions become especially devout. Religions had only ever been intertwined with other subsystems. They had to legitimize power or operated educational institutions and hospitals. Modern societies have taken over these functions, and religions can now concentrate on what they and the churches actually should be doing, namely dealing with the great irreversibilities – guilt and death – and their flipsides – the victims of crimes and the question of life after death. That cannot be delegated. The religious are persistently asked these questions.

KRÜGER: I regard the separation of church and state also as an evolutionary achievement. Of course, there are follow-up problems. In Europe the separation has been understood as if the state should act atheistically, whereas in the US there has always been a fusion of religion and politics. Secularization was not supposed to mean privileging an atheistic worldview. We need a public exchange between the religious and non-religious and not a hidden – and in our case-atheistic worldview. Political life should be accordingly diverse.

Mr. Krüger, if the various religious and non-religious belief systems increase, would we have to prepare ourselves for an increase in societal conflict?

KRÜGER: I think bringing two aspects together is difficult for every group: living out one's conviction in any kind of collective form, while recognizing that a pluralistic society permits various beliefs and is always generating new ones. It was still thought during the ideological conflicts of the 20th century that some social or economic revolution could change society in such a way that everyone's worldview would be consistent. Worldwide we basically experience a rather intensive continuation of the processes of individualization and pluralization. This mean we should be eager to learn about new and foreign belief systems.

HAFNER: I very much hope that pluralization will also lead to a civilizing of religions. It is becoming increasingly difficult for religions to move and operate only in their own Lebenswelt. When these milieus crack, they see that they are only one persuasion among others, which initially leads to conflict and resentment. In the long run, though, this has led in modern times to an unwavering set of beliefs on the one hand – people counterfactually hold onto that which they believe and withdraw into themselves – but on the other we see that religions band together when it comes to certain questions. This is not necessarily in the questions of high theology but rather in practical concerns, like how to deal with the environment, how to maintain peace, how to fend off the excessive demands of meritocracy, how to develop generational responsibility. This is where religions are increasingly engaging in dialog.

THE INTERVIEW WAS CONDUCTED BY DR. SOPHIA ROST AND MATTHIAS ZIMMERMANN.

THE SCIENTISTS

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A Jewish Bible „in the Spirit of the German Language"

The Torah Translated by Ludwig Philippsons

Photo: Die Heilige Schrift der Israeliten, illustrated by Gustav Doré, repro: Tobias Barniske

In 1839 the young Jewish scholar Ludwig Philippson took on a huge project. He decided to begin a new translation of the original Hebrew texts of the Torah into German and to publish an Israelite Bible for Jews. The project became a huge success because it was explicitly meant for use in everyday life. Until 1913 the Bible had been published a hundred-thousandfold in numerous editions and several printings. In the course of the 20th century, however, the text and its translator fell into oblivion. This might change again at the beginning of the 21st century. In fall 2014 Philippson's Torah (the Five Books of Moses) will be published again – newly edited and cautiously corrected, however, in the true spirit of the author. We talked to Prof. Rüdiger Liwak, co-editor, and Daniel Vorpahl, research assistant, who are involved in the careful editing of the text.

There are undoubtedly good versions of the Bible for Jews, says Prof. Rüdiger Liwak who is one of the three publishers of the new edition along with the rabbi Prof. Walter Homolka of the Abraham Geiger College and Prof. Hanna Liss of the Hochschule für Jüdische Studien Heidelberg. Nevertheless, Philippson's translation can still claim its place among the others. "His great achievement is that he adhered to the original Hebrew Bible text while also giving appropriate expression to the German language and its diversity," Liwak says.

"His aim was to publish a newspaper for all Jews."

Ludwig Philippson was just 28 years old when he started translating the Bible. He must have known that this enormous task of publishing a German version of the Bible explicitly for Jews would accompany him throughout his life. This might have pleased him more than discouraged him. The work of the polymath Philippson, who was born in Dessau in 1811, influenced Jewish life in Germany significantly. His father was a teacher and the founder of a Hebrew printing house. He might have passed on his thirst for knowledge and passion for texts to his son but died when his son was just four years old. Philippson already started school at the age of four and was an avid student of Hebrew. At the age of 15 Ludwig was the first Jew ever admitted to the well-known school of the Francke Foundations in Halle. He later studied classical philology in Halle and Berlin. Although he had already earned a doctorate at the age of 21, the gates of academia remained closed to him as a Jew. This did not dampen his journalistic enthusiasm, though. At the age of 16 he published his first work, a translation of a part of the Book of the Twelve, under the name of his brother. Just 26 years old, Philippson founded the newspaper "Allgemeine Zeitung des Judentums" (AZJ) in 1837, which he built up completely on his own as an author, publisher and sales manager. Until his death in 1889, he also edited the newspaper alone. The title of the publication always reflected his mission. He wanted to publish a newspaper for all Jews everywhere, no matter whether they were liberal or orthodox. As an advocate for equal rights for all Jews, Philippson repeatedly engaged in political activities.

"Then Philippson said, 'We need our own translation of the Hebrew texts!'"

Philippson's rhetoric talent had already attracted attention. When he was 22, in 1833, he took over the tasks of a preacher of the Jewish congregation in Magdeburg, a year later also became a state- certified "spiritual teacher" and in 1839 was officially appointed a trained rabbi. In 1861 he left his position as a rabbi because of his deteriorating health but continued his journalistic work until his death. Among them is his life's work – the translation of the Bible.

"There are two main reasons for his motivation to translate the Bible for Jews again," Liwak explains. "On the one hand, there was no suitable Jewish Bible in German at that time. Most German-Jewish households used a Christian Luther Bible. Many texts of the Old Testament are translated in such a way that they allude to the New Testament," Liwak says. "Philippson said, 'We need our own translation of the Hebrew texts!'".

TEXT COMPARISON GENESIS/BERESCHIT 1

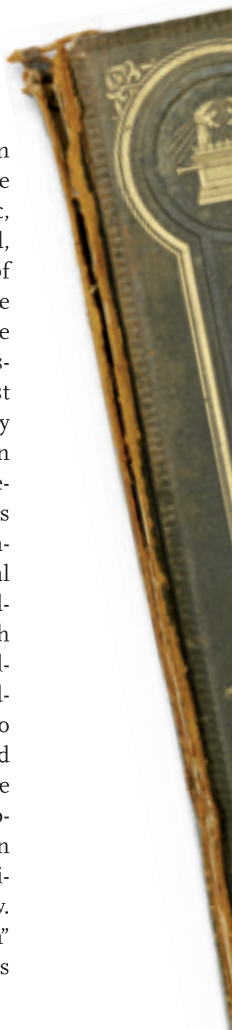
Philippson (1839/44)

1 [1]Am Anfang schuf Gott den Himmel und die Erde. [2]Aber die Erde war wüst und wirre und Finsternis über der Flut und der Geist Gottes webend über den Wassern. [3]Und Gott sprach: Es werde Licht. Da ward Licht. [4]Und Gott sah das Licht, dass es gut sei, und Gott schied zwischen dem Lichte und zwischen der Finsternis. [5]Und Gott nannte das Licht Tag und die Finsternis nannte er Nacht. Da ward Abend, da ward Morgen, ein Tag.

Luther (1545)

1 [1]Am Anfang schuf Gott Himmel und Erde. [2]Aber die Erde war wüst und leer und es war finster auf der Tiefe, und der Geist Gottes schwebte auf dem Wasser. [3]Und Gott sprach: Es werde Licht. Und es ward Licht. [4]Und Gott sah, daß das Licht gut war. Da schied Gott das Licht von der Finsternis. [5]Und nannte das Licht Tag und die Finsternis Nacht. Da ward aus Abend und Morgen der erste Tag.

Illustration by Gustav Doré from "Heiligen Schrift der Israeliten" translated by Ludwig Philippson.



After all, Philippson thought that Luther's translation was linguistically not very well done. In his "AZJ" he criticized it as "one-sided, monotonous and prosaic, whereas the original was multilayered and profound, full of momentum, tenderness and grandeur, full of variety and flexibility." Driven by the desire to give artistic expression to this original "in the spirit of the German language", he decided to begin his own translation. From 1839 Philippson's Israelite Bible was first published in 96 installments. Only then did a complete edition follow: in three volumes, in two languages – Hebrew and German –, and annotated as well as with 500 wood and steel engravings. The quite unusual didactical form of translating the texts into readable German, explaining them with the help of commentaries and using illustrations to make them understandable showed Philippson's intention to make his Israelite Bible a "Bible for everybody". And he succeeded. The first complete edition was said to be published more than 100,000 times by 1866. Philippson's ambition to edit the Bible for everyday life in schools, synagogues and at home led to numerous editions in different designs up through the 20th century. Among them is also a non-annotated "popular edition" without pictures. In 1874 a "bibliophilic edition" was published with 154 illustrations by Gustave Doré.

"He created a text that is very close to the Hebrew original while at the same time using the richness of the German language."

THE SCIENTISTS

Prof. Rüdiger Liwak has the Benno-Jacob visiting professorship at the "School of Jewish Theology" of the University of Potsdam.

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Photos: Zimmermann, Matthias (top/bottom), Die Heilige Schrift der Israeliten, illustrated by Gustav Doré, repro: Tobias Barniske (left)

Bibliophilic edition of Ludwig Philippson's translation of the Bible.

Photo: Barniske, Tobias

Commentary, illustration, bilingualism – for Vorpahl, who is working on the new edition of the text as a research assistant, the success of Philippson's Bible lies in the translation itself. "He created a text that is very close to the Hebrew original while at the same time using the richness of the German language," Vorpahl says. "When doing a translation you often have to decide whether you want to stick to the content of the source text or prefer to correspond to the aesthetics of the target language. Philippson often created a perfect symbiosis."

Daniel Vorpahl should know. Together with Susanne Gräbner, he is going through Philippson's translation, line by line. The new edition will include the haftarah, the readings from the Prophets, in addition to the Torah, the first five books of the Hebrew Bible. Vorpahl and Gräbner each have to go over 140 verses a week if they are going to finish the text on schedule by next spring. Their work will form the basis for the edition that should be adjusted to today's feel for language. At the same time they do want to retain the unique wording of the translator. Therefore: "As much Philippson as possible, as little revision as necessary," Vorpahl explains the principle of their work. Punctuation and orthography are adapted "as carefully as possible".

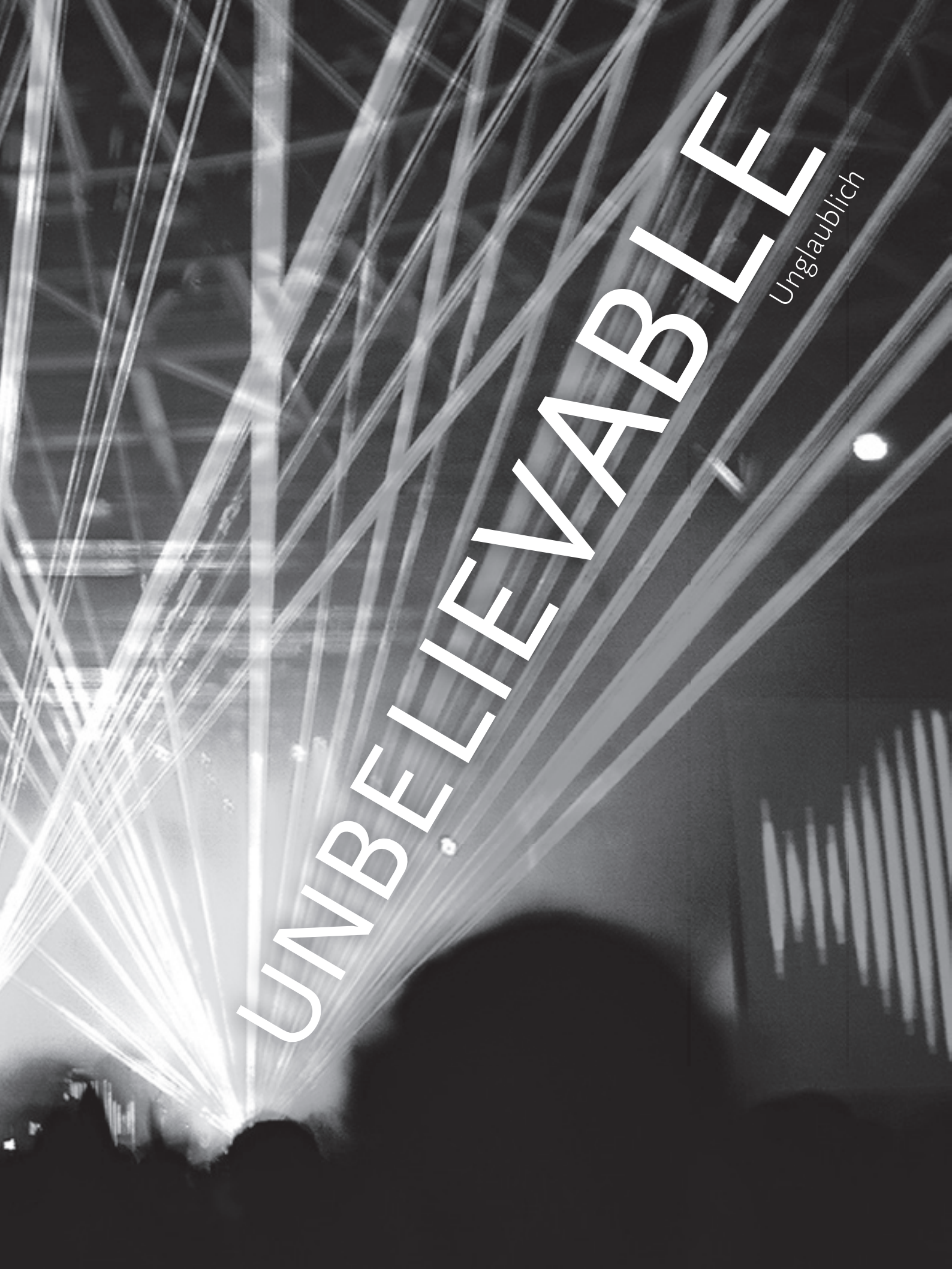
"As much Philippson as possible, as little revision as necessary."

For those terms that are entirely incomprehensible today, alternatives have to be found. "Sometimes we also find mistakes. Now and then Philippson forgot half a verse," Vorpahl says, "but this is very rare. Perhaps he was very tired when this happened." Their approach is definitely in line with Philippson's own understanding of his work. He reworked his own translation again in the 1860s.

Vorpahl and Gräbner then discuss the texts with the editors and decide how best to convey Philippson's text to a 21st-century audience. These decisions are often made after long discussions, as Liwak and Vorpahl confirm, but the process is worth the effort. While the new edition does not contain the commentaries and illustrations because they are too related to the time of their creation, the text is valuable precisely because it "ought not be radically modernized," as Liwak says. The text relates to the present Jewish faith through new introductions written by notable rabbis and biblical scholars. The expectations of the work are high, as Rüdiger Liwak admits. "There are voices who claim that the Philippson Bible could become THE Bible in German-Jewish circles." Daniel Vorpahl is convinced that the text will have many readers today. "It is difficult to say whether Philippson's translation is better than others. This is a matter of taste," he says and continues with a compliment that Ludwig Philippson would have liked. "We certainly find them more harmonic, more fluent and well more beautiful than all the others."

MATTHIAS ZIMMERMANN

Photo: Ash, Nick


UNBELIEVABLE
Unglaublich

One for All

Potsdam business informatics specialist designs a model factory

A conveyor belt, four tunnel-shaped boxes with touch displays and screens, a robot arm, several sensors, a scanner, antennas, cabling and a small metal box with displays all around. This is LUPO, not a compact car made in Wolfsburg, but a prototype of a plant for the "Productivity Evaluation of Autonomous Production Objects". Basically this is a factory: a chocolate factory, a factory for artificial joints or for tires or anything imaginable. The business informatics specialist Prof. Norbert Gronau and his team designed a so-called demonstrator that can simulate any number of production processes. It is a project funded by the Federal Ministry of Economics and Technology.

"LUPO offers a glimpse into the factory of the future," says Gronau. "It will be extremely versatile and to a large extent marked by technical innovations, especially in IT. Therefore we as business informatics specialists want to answer the question: Which new technology is suitable for factory applications, for whom and when? What turns out to be profitable and what not?"

To address this question for as many technological innovations as possible and to examine it with practicality in mind, the team has combined the advantages of computer-based simulation with those of a model factory. This means that all those production parts already known and analyzed are simplified in models and then simulated with computer programs. "For this we have designed these two cubes – our workpiece and our machine center demonstrator," Gronau explains, pointing to two metal boxes. While the "workpiece" is a loose container the size of a shoebox, the virtual machine forms a tunnel into which the workpiece can be inserted via a conveyor belt. Displays surround both. In the course of the simulated production process you can see on them what they "are" and which steps of the process are happening, because "you can upload different programs for both so that they behave like individual workpieces and machines." On the top side is a display that the scientists can use to intervene in the process and change parameters. It is possible to simulate big factories with many different machines and workpieces thanks to the roller conveyor that transports the workpiece cube from one machine center demonstrator to the next and thanks to shortcuts, branches, and loops. Gronau explains the work as based on the "principle of maximum flexibility. This plant is unique in Germany," he says not without pride. Since all cubes can be newly programmed, it is theoretically possible to design any factory layout.

"LUPO provides a glimpse into the future factory."

Why did the scientists not simulate the entire factory in the computer? "Because the decisive new aspect – about which we currently have little knowledge and want to find out a lot – is the interaction between machines, especially between machine and workpiece," Gronau explains. "Existing models of this type of communication do not meet this complexity," says the business informatics specialist. "They often fail to consider new technologies under development whose application we want to test in practical processes." The LUPO makers connected the individual machine cubes by a roller conveyor for practical trials. This allows them to integrate

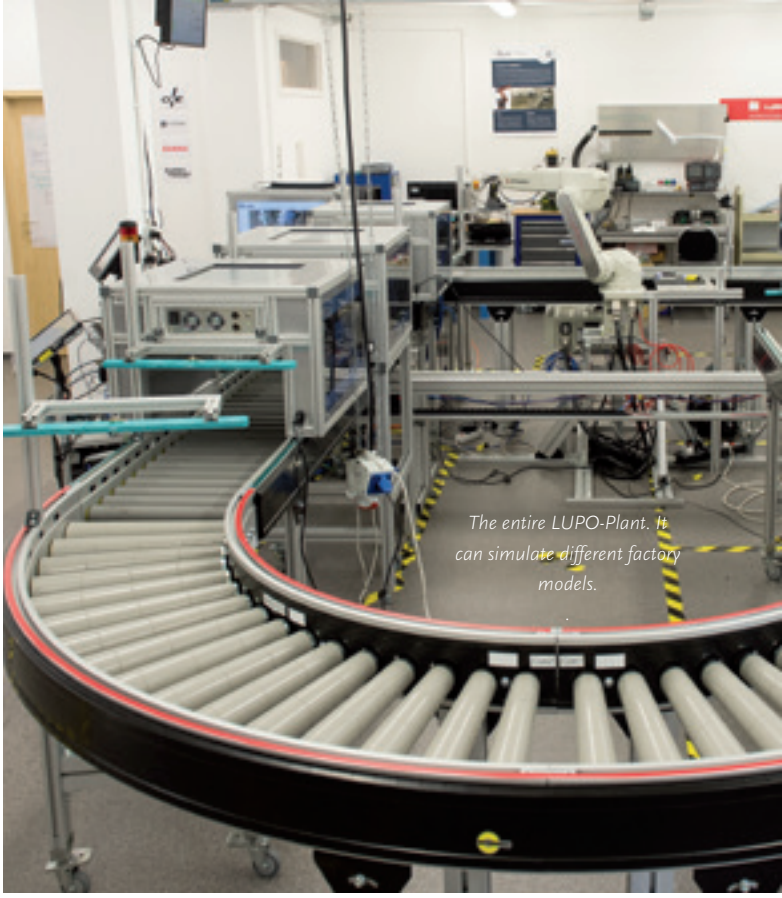
PROJECT
LUPO (Leistungsfähigkeitsbeurteilung unabhängiger Produktionsobjekte)
Productivity Evaluation of Autonomous Production Objects
Head: Prof. Norbert Gronau
Funding: Federal Ministry of Economic Affairs and Technology (BMWi)
Project period: 2010–2013
www.lupo-projekt.de

Photo: 20/21 Fritze, Karla

Prof. Norbert Gronau in the model factory.

Photo: 20/21 Fritze, Karla

View of a station in the virtual production line.



The entire LUPO-Plant. It can simulate different factory models.

different technical innovations simultaneously into the existing production process. By using scanners and movement sensors the machines can act more independently. This would result in fewer breaks and interruptions in the production process. The icing on the cake of autonomous production is an intelligent workpiece, the scientist explains, able to communicate with the machine itself. "Simple communication technologies like the barcode scanner have been used for a long time," Gronau says, "but an interaction between the machine and the workpiece is still not existent." RFID technology, radiofrequency identification, makes this possible. Sensors, machines in this case, read out information from chips attached to the workpieces. If the chips contain specifications on how to continue processing the workpiece, the machine "knows" what to do without a human starting the production step. Gronau describes the resulting magic formula for the factory of the future as, "less external and more self-organization". However, he does not see it as the universal solution on the path towards fully automated production plants but as a way to enable machines to solve malfunctions themselves.

"The icing on the cake of autonomous production is the intelligent workpiece."

LUPO cannot only calculate and simulate advantages for practice but can also demonstrate them. Gregor Hennig is one of the 12 project team members and is the "manager in chief" of a factory for artificial hip and knee joints whose production is being simulated with LUPO. He quickly makes final adjustments to demonstrate an accelerated manufacturing version to the hurried visitor. In this staged production line the intelligent and the "ordinary" workpiece have to compete. While the machine negotiates with the intelligent workpiece using RFID technology and then starts further processing, the ordinary workpiece always needs a worker for this process. You can even automate quality control with the help of the RFID chips because a machine compares the finished product with the specifications on the chip. In this case, Hennig removes the finished prosthesis; it's defective. Based on the data of real production, the team has also programmed the rate of wear, error, and failure into the production process to model it as realistically as possible.

In fact, there are production lines from different industry partners behind the simulations that have been developed so far. Among these partners gained at the beginning of the project was OHST Medizintechnik AG in Rathenow, a manufacturer of prostheses. Design and

THE SCIENTIST

Prof. Norbert Gronau studied mechanical engineering and business administration at the Technischen Universität Berlin. Since April 2004 he has been a full professor at the University of Potsdam. His research interests are Operational Knowledge Management and Versatile ERP-Systems, enterprise resource planning systems.

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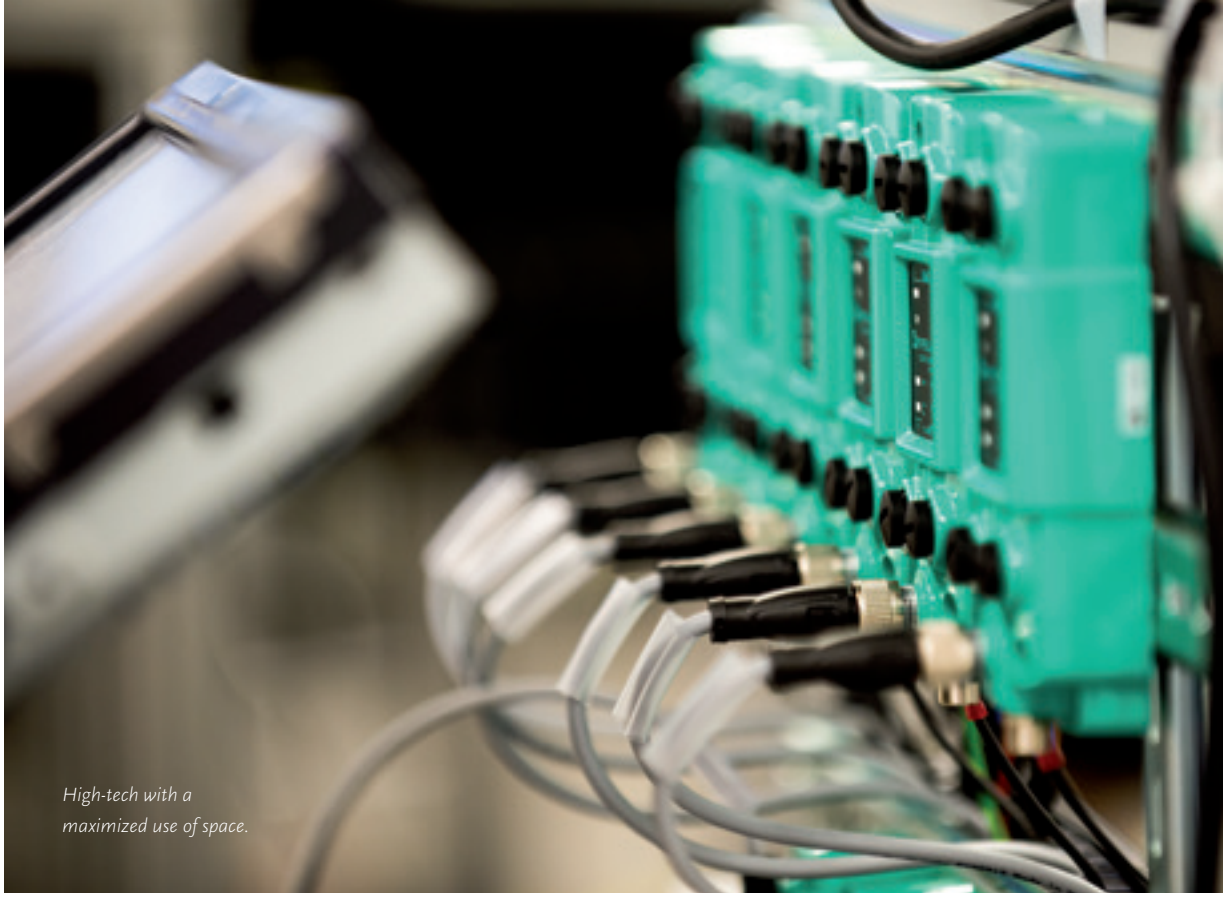
Photos: Fritze, Karla



High-tech with a maximized use of space.

programming of the model factory are based on an inspection of the existing manufacturing plant. Only after recording the production processes as accurately as possible and transferring it into computer models, can you complement it with new technologies and test their effect. "The basic application idea of LUPO is as follows," says Gronau. "If a factory director comes to us on a Monday and wants to know whether a certain technology is profitable for his factory, we will model it and can give him an answer on Friday."

"We want to show how versatile factories and their processes are."

Meanwhile word has got round that such a model factory can test very practically whether these expensive technologies deliver what they promise and are applicable for a certain type of production. This is mainly due to the clearness of the model factory, as Gronau stresses: "We want to show how versatile factories and their processes are. People from the companies can hardly believe that at first, but are surprised when they are here and we demonstrate to them what is possible." Initially there were two project partners but today there are already 15, and follow-up applications have been made for the research project.

But first and foremost Gronau is a scientist and his motivation is research. At the beginning of the project he had the wish "to make it possible to test the theoretical principle of versatility," he explains. "The system of the factory is very suitable for testing this concept." Students from the University of Potsdam also benefit from the innovative spirit that inspired LUPO. Since 2010 about 500 BA students of business studies and business informatics have "worked" in the LUPO factory during a LUPO teaching week every year. They are full of enthusiasm, as Gronau says. "The students get tours of the factory in small groups and get acquainted with the basic features of the production processes. For many of them it is a completely new field. I always ask who had ever been to a factory. There are never more than three – out of 500! They are all the more enthusiastic after having worked with LUPO."

MATTHIAS ZIMMERMANN

THE FUTURE OF LUPO

In September 2013 Anwendungszentrum Industrie 4.0, an Industry 4.0 application center, was founded as a key result of the LUPO project, its application and continuation. Companies have the opportunity to use the simulation environment to analyze their processes, test their own components and train their staff. In addition, this creates a network of industry (users, manufactures of machines and sensors, software producers) and scientists by having an active exchange regarding the latest developments in the field Industry 4.0.

Industry 4.0 melds the real and virtual worlds. Machines decide autonomously, devices communicate independently. Plants and tools can be adjusted to changing product and production requirements within a very short time. The goal is an intelligent factory (Smart Factory). Industry 4.0 provides numerous technologies and conceptions, for example the extended communication with OPC-UA, AutoID solutions, smart sensors and decentralized production management by using cyber physical systems.

www.industrie40-live.de

Photos: Fritze, Karla

When Just a Plaster Won't Do

Polymers for the medicine of tomorrow

At the 'stress-strain machine' for hydrogels. These are polymers with shape-memory. The machine is used to examine the mechanical properties of this material.

Since early 2013, the Helmholtz Graduate School for Macromolecular Bioscience has been offering PhD students a structured, interdisciplinary training program at the Institute of Biomaterial Science of the Helmholtz-Zentrum Geesthacht in Teltow (HZG). In this joint project with the Freie Universität Berlin and the University of Potsdam, young researchers are developing biocompatible polymers that could be used in implants, for instance in artificial blood vessels or cardiac valves. Unique to this graduate school is the close collaboration between chemists, physicists, engineers, physicians, biologists and biotechnologists.

Simple bone fractures heal on their own; smaller cuts and abrasions heal spontaneously. However, these natural self-healing capabilities are not sufficient in cases of complicated fractures, extensive wounds like an "ulcerated leg", or defects of the blood vessels or heart valve. This is where regenerative medicine comes in. Biomaterials temporarily or permanently adopt the function of the missing tissue and may serve as a guiding structure for self-healing.

The future belongs to synthetic polymers. Depending on what kind of chemical components are linked to form polymers – long chains, networks or three-dimensional structures – they exhibit characteristic properties. The possibilities are virtually endless.

"Biologists, biotechnologists, and physicians focus on the complex interplay at the biomaterial/tissue interface."

The Graduate School for Macromolecular Bioscience that started in early 2013 focuses on research and development in polymer-based biomaterials, the interaction of cells with these novel biomaterials as well as on developing the necessary methods to explore these interactions. With 17 research groups, the joint project of the Helmholtz-Zentrum Geesthacht in Teltow with the Freie Universität Berlin, the University of Potsdam, and the Helmholtz-Zentrum Berlin as an associated partner offers PhD students a structured program in this innovative field. The Helmholtz Graduate School has been established to combine the existing manifold skills of the partners from various disciplines in Berlin and Brandenburg, focusing competences, and enhancing international visibility.

In the near future, about 80 students will be part of the graduate school. The 55 PhD students who are already part of the school are a diverse group in every respect. They come from various European countries but also from Russia, Iran, India, and China as well as from very different disciplines. Here it becomes apparent that biomaterial research is a prime example of interdisciplinary collaboration. Chemists develop suitable synthetic polymers for medical applications. Physicists and engineers process them to achieve novel properties. Biologists, biotechnologists, and physicians focus on the complex interplay at the biomaterial/tissue interface.

At the Graduate School, biomaterial researchers communicate exclusively in English during colloquia, courses and the annual summer school. However, their scientific exchange requires far more than mere English skills. "The students also have to understand the language of the other disciplines," says chemist Dr. Marc Behl, head of the Department "Active Polymers". As if to prove that no discipline can do without the other, he sits together with physico-chemist Dr. Karl Kratz, head of the Department "Polymer Engineering". "We need the feedback of biologists and physicians," he hands over to Chinese physician and biologist Prof. Nan Ma, head of the Depart-

Photo: Fritze, Karla

ment “Biocompatibility”. She adds, “Our graduates have to think far beyond their own disciplines.”

The project “Inducing Memory Effects in Polymers by Physical Treatment” by Kratz’s team of PhD students at the Graduate School demonstrates how the interplay works. Physicists, chemists, and engineers need active polymers, and Behl’s group specializes in their design and synthesis. These materials are called ‘active’ because they react on external stimuli taking a different shape, for instance. After another signal, they return to their original shape; they “remember” it. Biologists, together with physicists, chemists and engineers, consider physical treatment methods they can use as a stimulus without damaging tissue: light, temperature changes or applying a magnetic field.

“Our graduates have to think far beyond their own disciplines.”

This leads to further specific requirements for the chemists. The polymer’s composition decides how sensitively the future material will react on the selected signal. This demands an exact analysis of the internal molecular architecture, spatial positioning, and flexibility of the components. “We know the natural properties of the components and different materials,” Behl says. “Combining them in an unexpected way yields new functions.”

Physicians, chemists, and engineers test and manipulate the active synthetic polymers in their laboratories until they react in the desired way. Kratz demonstrates a few perplexing examples of biomaterials with shape-memory developed during this collaboration. A thin plastic rod about the length of a finger, initially stretched out, rolls up into a little “pigtail” at the lower end when affected by an alternating magnetic field. As if by magic, a plastic rod takes three different shapes under different temperatures. From the stretched shape, it folds or rolls into a z-shape and stretches again an unlimited number of times. This could be developed into “intelligent” catheters that can be inserted pain-free into the ureter in a compressed shape, where it would unfold and release a specific medicine.

“We test and manipulate the active synthetic polymers in the lab until they react in the desired way.”

The novel degradable polymers, Behl’s department is working with in the project “Depsipeptides”, do move less but are multifunctional. The chemical constitution of these special polymers is somewhat similar to those

Working on an ‘electrospinning device’: A liquid polymer is in a syringe, equipped with a metal needle, on which an electrical field is applied when extruded from the needle tip. Then the material coagulates into very fine fibers invisible to the human eye. They can be collected either in reticular or parallel shapes.

Photo: Fritze, Karla

THE PROJECT

The Helmholtz **Graduate School for Macromolecular Bioscience** is a collaboration between the Institute of Biomaterial Science of the Helmholtz-Zentrum Geesthacht in Teltow (HZG), the Freie Universität Berlin, and the University of Potsdam. Prof. Andreas Lendlein, Director of the HZG-Institute in Teltow and Professor of Materials in Life Sciences at the University of Potsdam, played a leading role in establishing the school. The project is funded with 2.4 million Euros over a period of 6 years by the Helmholtz Association, complemented by stipends from the partners. Prof. Beate Koksch from the Institute of Chemistry and Biochemistry at the Freie Universität Berlin is the spokesperson of the Graduate School. Prof. Nan Ma from the Institute of Chemistry and Biochemistry at the Freie Universität Berlin and head of the Department “Biocompatibility” at the Institute of Biomaterial Science is the deputy spokesperson.

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Young academics of Behl's group at the 'stress-strain machine': Maria Balk, Mersa Saatchi, Pengfei Zhang (from left).

of proteins and of synthetic polymers known as polyesters. The researchers are working to optimize the components' constitution so the implant inserted into the body adjusts to the defect as a result of body temperature and is then populated by somatic cells before being gradually broken down into its components by endogenous enzymes and finally metabolized. Since this disintegration is linked to biological processes, it is clear that the chemists and biologists have to work very closely during the development process. Of course, the biologists thoroughly test each biomaterial that meets the expectations of the chemists and physicists on cells first in petri dishes and later in selected animal models to ensure there are no side effects.

In a separate project "Geometry of Biomaterials and their Influence on Stem Cell Development", PhD students in the group of physician and biologist Nan Ma try to understand how the natural ability for regeneration can be pushed with so-called induced stem cells. These are perfectly normal somatic cells that can be cultivated in the lab. Under controlled conditions, they can be put into a state, in which they are able to regenerate a certain type of tissue. The researchers want to develop a kind of polymer "Band-Aid" covered with such cells. When inserted into damaged or occluded blood vessels, it could trigger a kind of natural repair of vascular walls. Nan Ma is already thinking ahead. "Depending on the application, such an implant might be equipped with a memory-effect."

"Each biomaterial is thoroughly tested at the beginning."

"The PhD program of the Graduate School ensures optimal interdisciplinary training due to the subject-specific orientation of the research field," summarizes Prof. Dr. Andreas Lendlein, Director of the HZG-Institute in Teltow and Professor of Materials in Life Sciences at the Institute of Chemistry and the Institute of Biochemistry and Biology of the University of Potsdam. Apart from the specialist training in their respective disciplines, PhD students also receive training in key skills and management qualities at the Dahlem Research School and the Potsdam Graduate School. The school's spokesperson, Prof. Beate Koksch from the Institute of Chemistry and Biochemistry at the Freie Universität Berlin, regards this research association as a unique hub both spatially and scientifically. "The interdisciplinary thinking and research necessary for the development of modern biomaterials is not an essential part of existing university programs because it requires a specific scientific infrastructure, which is unique in Berlin and Brandenburg," Koksch says. "With the Graduate School for Macromolecular Bioscience, the Helmholtz Association has established a cutting-edge training program that will not only expand and stabilize the existing numerous activities of the three partner institutions but also increase the international visibility of biomaterial research in Berlin and Brandenburg. The school's graduates will be able to begin their career as preeminent specialists in the modern development of biomaterials with management skills."

SABINE SÜTTERLIN

Photo: Fritze, Karla

Guest Commentary

BY JINGER PAN
DEPARTMENT OF PSYCHOLOGY, UNIVERSITY OF POTSDAM

It was in the beginning of 2010 that I first arrived in Potsdam as a visiting student from China to start a new collaborative project. Now I am working here as a post doctoral research scientist.

In almost 4 years, I kept flying back and forth between Germany and China because I have been working on Chinese reading and I collected my experiment data in China. In most of the time when I was in Berlin, it was winter time. The typical cold and lack-of-sunshine German winter made me feel depressed. However, the administrative staff and my colleagues did give me a really warm and sunny welcome every time I visited. Especially the University Welcome Team and the secretaries in our lab provided a lot of help for many aspects which freed me up for research.

Regarding the research aspect, almost everything I experienced here at the University of Potsdam is related to Prof. Kliegl and his group in the Psychology department. I have a very deep impression that our team is very open to new research and data analysis methods. Prof. Kliegl is especially keen on using new statistics on our data. He did a lot of exploratory works in analyzing data with new methods.

The open attitude towards new research methods also influences teaching. During my stay in Potsdam, I attended a few courses related to research methods and statistics. I was impressed that many teachers not only use real data they collected in their own experiments as examples in teaching and offer these data to students to "play with", but more importantly, they always introduce the most up-to-date statistics they themselves newly acquired and teach the students how to apply them to the example data sets. In addition, they also encourage and help students to apply these methods on their own data. As a student in these courses, I highly appreciate this open attitude because it really facilitates students in knowing what to do with different kinds of data sets. Teachers here do not always stick to old and boring textbooks but they step forward to make sure that students get the most up-to-date knowledge and are well equipped with skills in future research life.

Another striking impression I have is that we make the data of our published work available online (i.e., Potsdam Mind Research Repository), and we also offer all our scripts that we used in data analyses to anyone whoever interested. It is not very common in our research field that scientists are willing to share their own data. In this way, we offer a chance to communicate our work with others in a more comprehensive way. In addition, this also acts as a platform for students to learn about new statistics.

The scientific environment in Potsdam makes it a very lovely place for both local and foreign scientists and I wish that the University moves on and on in the future.

Photos: Fritze, Karla (right), Pan, Jinger (left)

Photo: Ash, Nick

Misconception

Irrglaube

Too Much
or
Not Enough

Malnutrition – A worldwide problem

Photo: 3/31 pixelio.de/Iris

Not enough food to fill the stomach. This is bitter reality for about 2 billion people on our globe. Millions die every year. Undernourishment is still one of the most pressing problems in the poorest countries of the world. There is, however, an increasing number of nutritional problems in developing countries also found in industrialized countries. Food that is too fatty, too sweet or salty causes overweight, diabetes and cardiovascular diseases. "Double Burden" is the term experts use for this phenomenon that two contradicting nutritional problems exists next to each other. In the joint project "Nutrition and Public Health", nutritionists from the University of Potsdam and Asian researchers examine various aspects of this phenomenon and look for ways to relieve the health systems in the affected countries.

Overweight and obesity are affluence problems of industrial nations. This picture is still deeply rooted in the collective thinking of the western world. The data collected by nutritionists all over the world suggest something different. Adiposity also exists and continues to grow in the least developed countries. Similar to Europe and North America, many people in Africa, Asia and Oceania consume more energy through food than they can use. Similar to those in the northern hemisphere, many in the global south have a sedentary lifestyle. The double burden of undernourishment and overnutrition has a devastating effect on the health systems that are already inadequately equipped with personnel and materials. Well-trained health experts and innovative approaches are necessary to master these problems.

There is a shortage of both. Equipment is often sparse and possibilities limited. At public universities in developing countries, teaching and research mainly take place under difficult conditions. "They lack practically everything, especially money," says Dr. Ina M. Ott from the Institute of Nutritional Sciences at the University of Potsdam. For example, there are hardly any modern instruments in the laboratories of universities and research institutions in Vietnam and Laos. Complex analyses or experimental studies are often not possible. Sometimes even laboratory rooms do not exist and it is difficult to exchange ideas and results with scientists from other countries. This is exactly the starting point of the project "Nutrition and Public Health" of the Potsdam Institute of Nutritional Sciences. Scientists from Laos, Vietnam, and Thailand want to promote a mutual exchange in the field of nutritional sciences with researchers from Potsdam lead by Florian J. Schweigert, Professor of Physiology and Pathophysiology of Nutrition. The motto is 'Help for self-help'. "We want to use the existing structures to sustainably improve the situation at the universities in these countries," says Ott, the project coordinator. The almost 200,000 € in funding come from the German Academic Exchange Service (DAAD).

"Adiposity also exists and continues to grow in the least developed countries."

Photos: 31 right: Ott; Dr. Ina, 30/31 pixelio.de/rns

THE SCIENTIST

Dr. Ina Ott studied nutritional science at the University of Potsdam and completed her doctoral thesis in 2013. She is currently researching renal failure in diabetic patients at the Institute of Nutritional Sciences.

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In 2005 the DAAD launched the program "Partnerships for the Health Sector in Developing Countries" (PAGEL) and has since supported joint projects between German universities and developing countries. The aim is to improve teaching and research at the partner universities as well as the level of health care on a long-term basis. The Federal Ministry for Economic Cooperation and Development (BMZ) provides the financial resources.

Together with the Khon Kaen University in Thailand, the University of Health Sciences in Laos and the Thai Nguyen University in Vietnam, the University of Potsdam now forms a research quartet focusing on the "Double Burden" problem. The aim is to initiate joint scientific investigations and to establish or expand a public health degree program with modules in nutritional sciences. Ott stresses that it is not only important to build a network between the North and South but also between Asian countries. "There should be a continuous exchange between scientists, scholars and students." Eventually the health system should benefit from such networks.

"Iodine deficiency is a problem in Thailand."

Two MA students from Potsdam will begin with a concrete research project. They will travel to Thailand for three months to carefully examine the iodine supply of the people there. "Relief measures often have no impact because they do not consider cultural and social backgrounds," describes Ott. Similar to Germany, Thailand also adds iodine to common salt. "Iodine deficiency is a problem in Thailand," Ott explains. "However, the question is whether the iodized salt really gets into the cooking pots," the scientist says. Traditionally Thai people season their food with soy sauce, not so much with salt. In rural areas there is another problem. The salt is kept out in the open, often next to the cooking place. It is still unclear whether the iodine content is retained under such conditions, as Ott explains. The two students will use questionnaires to evaluate how often households use salt for cooking. They will analyze salt samples to establish the actual iodine levels in them.

In this way the project partners want to work locally and at eye level, including annual summer schools in the partner countries, to achieve sustainable results. The nutrition of people during their lifetime will be in the foreground of these studies. Students and alumni from the four cooperating countries will be able to get information about the current research results, e.g. regarding the influence of a mother's nutrition on the unborn child or the special needs of the elderly.

Lastly the researchers expect positive effects on research and teaching in nutritional sciences at the University of Potsdam. "While we can contribute biochemical know-how, our project partners have a lot of experience in 'Public Health', i.e. in the data collection and analysis on the spot," Ott comments. In addition, the project partners in Potsdam and at the partner universities want to establish the English module "International Nutrition", followed by a separate MA-degree course. Course content will be increasingly communicated via e-learning lectures at the University of Potsdam and in the partner countries. This will include online tests, comprehensive modules and videos. "This is much more authentic and sustainable when someone is living in these countries and gaining the respective experience," and students in particular would benefit from it, Ott summarizes.

HEIKE KAMPE

THE PROJECT

Nutrition and Public Health

Participants: Department of Physiology and Pathophysiology

Duration: 2012–2016

Funded by: German Academic Exchange Service (DAAD)

Photo: Fritze, Karla

Education or Voyeurism?

Potsdam geographers study what slum tourism changes in visitors and visited

Museums and markets, animals and temples, picturesque landscapes and friendly people – these are the things that most people want to experience when travelling abroad. But what about poverty-stricken areas or even waste deposits where people in rags rummage for anything useful? An increasing number of tourists travelling to the metropolises of developing and threshold countries also visit such places that are anything but idyllic. Dr. Fabian Frenzel and Prof. Manfred Rolfes from the Department of Geography examine in what way slum tourism can alleviate poverty.

Excursions to Table Mountain or a safari in Kruger National Park are among the classical highlights of a trip to South Africa. Of the approximately 2 million tourists from all over the world who visit South Africa every year, an estimated number of 800,000 also book a guided tour through the "townships", the shantytowns at the outskirts of Johannesburg, Durban, and Cape Town.

"Slum tourism" came up at the beginning of the 1990s, after apartheid, when politically interested visitors wanted to

Brazilian tourists are taking photos in front of the Favela Complexo Alemao in Rio de Janeiro.

Photo: Frenzel, Fabian

THE PROJECT

The two-year research project **"Qualitative indicators of tourism's role in poverty alleviation"** began in September 2012. The European Union awarded a Marie Curie Fellowship in its Seventh Framework Program. All researchers working in this field will meet at a conference in Potsdam in May 2014.

http://slumtourism.net/destinationslum

Prof. Manfred Rolfes (left) and Dr. Fabian Frenzel.

see how Nelson Mandela and other freedom fighters had lived in the township of Soweto. This niche product has since turned into an independent business branch of the global travel industry that has promptly come under criticism. Slum tourism, critics say, merely satisfies the voyeuristic desires of the affluent who want to shudder at the misery of others before returning to their five-star hotel.

Are these allegations justified or can slum tourism actually contribute a bit to closing the gap between the poor and rich? These questioned are examined by political scientist Fabian Frenzel in the project "Qualitative Indicators of Poverty Alleviation", for which Frenzel received a Marie Curie research grant of the European Union and set himself up at the Department of Geography at the University of Potsdam with Prof. Manfred Rolfes, one of very few specialists worldwide in this research field.

It has already become clear that even normal tourism in developing countries hardly alleviates the need of the poorest, as once hoped. Additional revenues end up primarily in the pockets of those who already have investment resources. Are not the "few bucks" that tourists spend in South African townships, Latin American favelas or Indian slums just a drop in the bucket in the face of such a mammoth task?

"We define poverty reduction not only by the amount of money spent by tourists and by who benefits financially," Frenzel makes clear at the start, because poverty is more than just the shortage of material goods. It also includes social discrimination and limited areas of experience. It complicates the access to land ownership, education and political participation. "We want to know what slum tourism changes in the minds of both the people living there and the visitors," Frenzel says.

In contrast to cash flow, you cannot count or measure the changes in thinking and behavior and in the relationships between the visitors and the visited. By using case studies and interviews Frenzel is developing indicators that can describe such effects of slum tourism.

"We want to know what slum tourism changes in the minds of both the people living there and the visitors."

A look into the past reveals that this is not a new phenomenon. In around 1840, members of the London high society started making pilgrimages to the East End, often accompanied by journalists looking for an enlightening story. Among them were also social reformers who wanted to help the poor escape misery. These visitors from the upper class of the Victorian age were surely also driven by their curiosity to see the losers of industrialization. "Already

THE SCIENTIST

Dr. Fabian Frenzel studied social and political sciences at the Freie Universität Berlin and in Great Britain. In 2010 he received his PhD from the Leeds Metropolitan University. Until 2012 he taught tourism in England. Then he joined the Department of Geography at the University of Potsdam, where he leads the research project about the poverty-alleviating effects of slum tourism with Prof. Dr. Manfred Rolfes, who has held the professorship of Regional Studies and Applied Human Geography since 2004.

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Photo: Fritze, Karla

during these early periods of slum tourism there were visitors with altruistic intentions and those who wanted to get a glimpse of the 'darker' side of society," Frenzel says.

The recent trend started similarly. When apartheid was still being enforced in South Africa, excursions to the ghettos of people of color were an official tourist attraction. At the same time, activists from all over the world had local civil rights activists and non-governmental organizations show them the restrictions resulting from allocating residential districts based on skin color. After racial segregation, tourism started to boom. More and more visitors not only wanted to enjoy the beauty of landscape but also to learn more about the country's history. Meanwhile nearly 50 providers in Cape Town alone offer foreign visitors insight into life in the townships for a few hours.

Shrewd activists in Rio de Janeiro used the international boost of the 1992 Earth Summit to guide interested people through Rocinha, the largest favela of the Brazilian city. Today about 20 independent travel guides and eight commercial providers bring to light the reality of life in the slums for about 50,000 visitors every year. Meanwhile almost all megacities in the southern hemisphere offer sightseeing in the slums. This part of the tourism sector got new impetus by films like "City of God", set in one of Rio's satellite cities, and "Slumdog Millionaire" whose protagonist manages to get out of Dharavi, Mumbai's biggest slum. For a while now, it has not been only inhabitants who work as "guides". In Bangkok, a large commercial provider got into this business from the very beginning a few years ago.

"Meanwhile almost all megacities in the southern hemisphere offer sightseeing in the slums."

Thus "Undercover Tours" or "Reality Tours" eventually end up on "normal" itineraries of long-distance travelers. But what is going on in their minds? "Our previous interviews showed that many have to correct their picture about poverty," Frenzel says. For example, most visitors of Dharavi were surprised that the poor people do not just sit doing nothing but have a more or less regular daily routine. Children go to school and most adults pursue some kind of trade. They wash clothes, repair bicycles or make basic commodities from recycled material. On some tours the tourists also learn that not all slums are the same. Some districts have already experienced an upswing. "Very few visitors are aware that slums are often the first place for rural refugees who pour into the cities to find a job and some income," Frenzel says.

You can also observe change in the slum inhabitants, initially among those who organize tours, no matter whether they take the initiative themselves or take up the ideas of experienced tourists or non-governmental organizations. The guides have to learn other languages. They learn to understand what tourists are looking for and what prices they are willing to pay. "They gain a certain level of mobility," the researcher summarizes. Some keep in touch with former visitors via social media. If political or development organizations are involved, they are sometimes invited to other countries.

Many details support the idea that large parts of the population consider the slum tours as an acknowledgement of their existence. Frenzel says that Google Maps recently deleted the favelas of Rio de Janeiro at the behest of the Brazilian government, who regarded them as an eyesore. The people living there, however, had developed a new kind of self-confidence due to the interest of foreigners and struggled to get back on the map. Meanwhile the city of Rio has taken care of escalating drug-related crime and organizes slum tours itself.

It is still too early to give final answers to some questions raised in the research project. However, Frenzel's mentor Manfred Rolfes can already say now, "I would recommend such a tour to everybody."

SABINE SÜTTERLIN

Photos: Frenzel, Fabian

Langa Township in Cape Town (South Africa) is one of the most visited slums in the world.

Mental Number Line

The role of finger counting and the significance of embodied cognition

Is our brain a computer? A calculating machine? A processor of information with memory capacity problems? For a long time neuroscientists thought so. New theories say that knowledge is always connected with sensomotor perception and that the mind cannot be examined isolated from the body. Martin Fischer, Professor for Cognitive Science at the University of Potsdam, also advocates the "embodied cognition" approach. Together with the "Potsdam Embodied Cognition Group" he examines the significance of finger counting for our understanding of numbers.

Children all over the world count with their fingers. Many also use their hands when they are learning to add, at least in the number range up to ten, after which it gets more difficult. Even after having learnt mental arithmetic, numbers and fingers will remain "linked" throughout their lives. For instance when asked to count the syllables of a sentence, adults will say the words either in their thoughts or aloud and use their fingers to count. "The brain cannot say one thing while counting another," Fischer explains. "That is why it outsources this task." Cognitive scientists call this the "externalization of memory".

"Numbers and fingers are 'linked' for life."

As part of the "Potsdam Embodied Cognition Group" he founded, Fischer's current project examines the significance of finger counting for the representation of numbers in the brain. So far they have tested only adults.

THE SCIENTIST

Prof. Martin Fischer studied psychology at the Technical University of Aachen and then researched motor control and eye movement during reading at the University of Massachusetts – Amherst. After completing his PhD he worked at the Ludwig-Maximilians University in Munich and the University of Dundee in Scotland. Since 2011 he has been Professor of Cognitive Science at the University of Potsdam.

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Doctoral candidate Elena Sixtus (left) and Prof. Martin Fischer.

Photos: Fritze, Karla

PhD student Elena Sixtus demonstrates a method in the laboratory for examining the relation between the fingers' discrimination capacity and number processing, in which test subjects hold two handles that alternately stimulate their fingertips. While the subject says the number corresponding to the finger, the researcher can monitor the speed and precision of the information on a connected computer. Marks on the stimulated fingers appear on the monitor that displays two hands with the fingers spread.

They also plan to test children. Reliable knowledge about the representation of numbers in the brain, their sensual and spatial perception can help to diagnose and treat dyslexia at an early stage, improve math textbooks and develop educational computers. "When children move the cursor with a mouse on the computer, they have to coordinate between their hand and the screen. This requires comprehensive mental performance," says Fischer. "Purely motor-operated tablets do not require this spatial transformation, which is why we learn more easily with them," the cognitive scientist says.

Although the present study is fundamental research, Fischer constantly has future applications in mind. He has been working with the Potsdam Zentrum zur Therapie der Rechenschwäche, a center for dyscalculia and arithmasthenia, to help people suffering from these disorders. Not least, findings about "embodied cognition" can help in neurological rehabilitation. The influence of thinking by spatial perception becomes evident when limited by disease or injury. Fischer reports on patients who suffer from so-called hemispatial neglect after a stroke. "They ignore the left side of space. When they draw a clock you can only see the numbers 12 to 6. When asked to divide a line in the middle, they put the slash on the right third …"

"How are numbers represented in our brains?"

How are numbers represented in our brains? Fischer thinks that people develop a mental number line. Addition moves from left to right on this hypothetic line, subtraction from right to left. Small numbers are on the left, big number on the right. A simple experiment[1] impressively proves this. Subjects were asked to turn their heads according to the clicks of a metronome and say numbers between one and thirty. While facing left, they said relatively small numbers, whereas facing right they tended to say larger numbers. Whether on a ruler, timeline or keyboard, numbers increase from left to right. "When we count with our fingers we prefer starting with the left thumb, at least we Europeans," Fischer adds and refers to cultural differences. "North Americans also begin on the left but mostly with the index finger. While we stretch our fingers from the fist, Asians begin with their open hand and then bend their fingers one by one. Chinese people can even count up to ten on one hand by crossing two fingers."

"Chinese people can even count up to ten on one hand by crossing two fingers."

That the number line in our head is culturally influenced is most clearly demonstrated by the counting method in Arab countries: "Just as they read and write from right to left, they also start counting on the right, very often with their little finger," says Fischer. If and how these different techniques influence the understanding of numbers and arithmetic capacities still has to be examined. The Potsdam cognitive scientists are collecting data worldwide with the help of an Internet-based finger questionnaire. More than 3,000 people have already taken this 5-minute test. "We would like more participants from Asia. Data from African and Latin American countries is still quite sparse, too," Fischer says, pitching the short experiment. To take part and count with your fingers for the sake of cognitive science, visit *www.counting.cognitive-psychology.eu*.

ANTJE HORN-CONRAD

THE PROJECT

Manumerical cognition: Assessing the contributions of ordinal, cardinal and spatial components of finger counting to adult numerical cognition

Funded by: German Research Foundation (DFG)

1 Loetscher, T., Schwarz, U., Schubiger, M., & Brugger, P. (2008). Head turns bias the brain's internal random generator. Current biology, 18(2), R60–62. doi:10.1016/j.cub.2007.11.015

Photos: Fritze, Karla

CREDIBLE

Glaubwürdig

Photo: Ashr Nick

Fresh Spirit of Research

Young academics and professors prevail at the Collaborative Research Center „Information Structure"

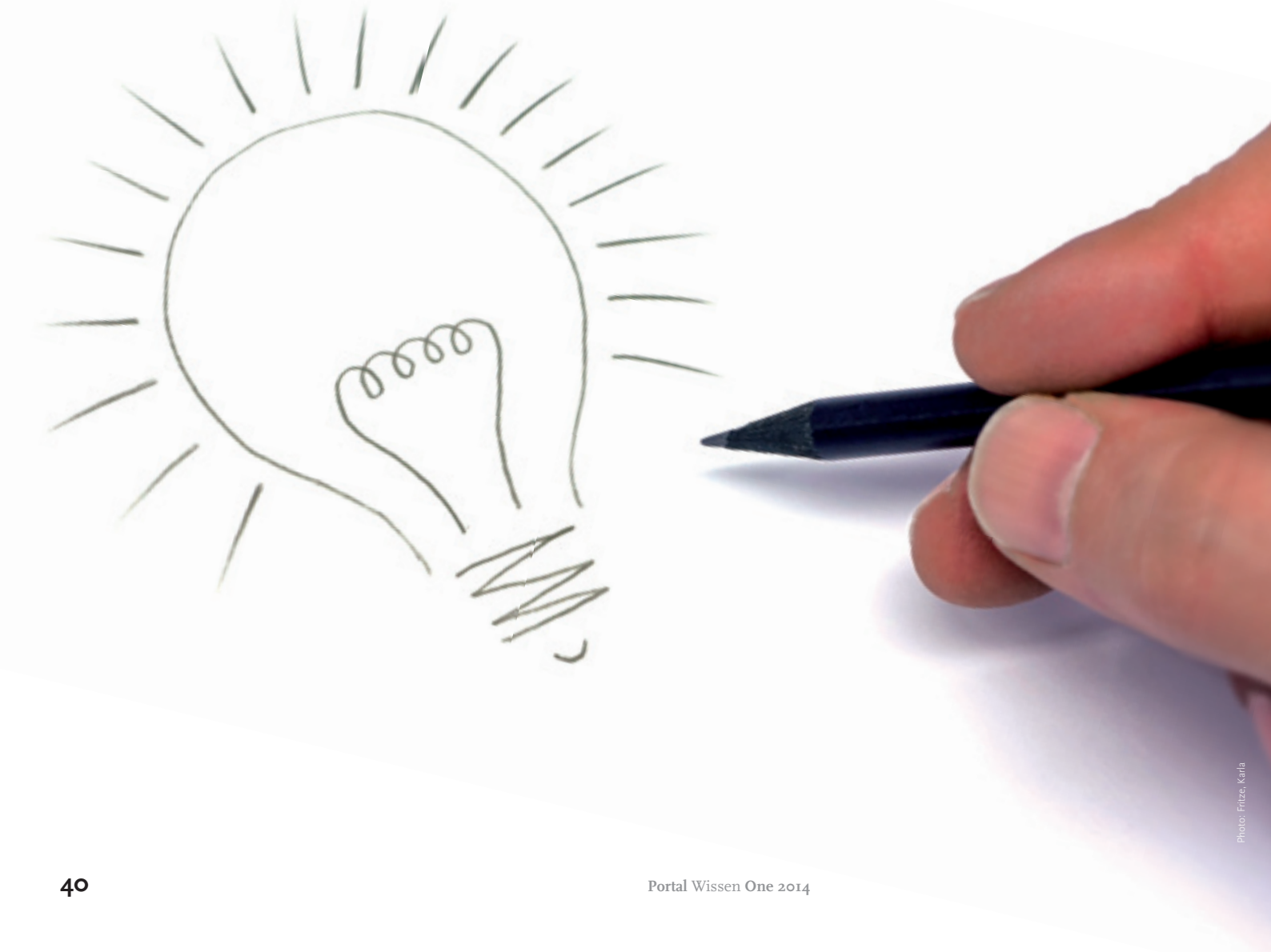

Photo: Fritze, Karla

"Business is good," says Prof. Malte Zimmermann, smiling contentedly. The "business" is the Collaborative Research Center (SFB) "Information Structure", which Zimmermann, a linguist, heads and for which he is a spokesperson. For years now, academics at the University of Potsdam, Humboldt-Universität zu Berlin and Freie Universität Berlin have approached this topic from different angles that gave the research partnership its name. It has taken up the basic concept of the German Research Association (DFG). The idea is to enable innovative research projects across institutes, disciplines and faculties with the help of more than 200 existing collaborative research centers.

It was not a matter-of-course that Zimmermann would lead this long-term research project given that he was still only a junior professor when they applied for the third funding period at DFG in 2011. Even the German Research Association was initially skeptical of this but later approved. Zimmerman says he felt a bit uneasy when he assumed his post. "If there had been disputes with experienced colleagues, I would not have been in a good position. Fortunately, there was a highly collegial spirit in Potsdam, so there were no problems at all." Zimmermann is not the only young academic who assumed responsibility at the SFB at an early stage. "Many sub-projects are led by colleagues who have not habilitated," stresses Zimmermann. He knows the importance of this work for his own career and those of his young colleagues. "Having such a leadership position on your resume definitely means something."

Although there was not a stampede for this post, Prof. Zimmermann was nevertheless very grateful for the support he received. This encouragement might have come from his previous work at the Humboldt-Universität zu Berlin. When he moved to Potsdam he was already familiar with some Berlin projects and people, which facilitated a close collaboration between Berlin und Potsdam promoted by the SFB.

The University of Potsdam, as the applying institution for the SFB, manages the association. In Potsdam, the linguistics and German departments play a decisive role at the SFB. Altogether 53 scientists in 19 projects with a common academic interest in information structures research at the intersection of pure linguistic subject matters and other cognitive domains like attention control and memory.

But what is behind this rather cumbersome term 'information structure'? A simple sentence might illustrate the basic concept: Leon and Luise are talking with each other. Leon says to Luise, "Peter is going to Potsdam tomorrow." Depending on what information is new to Luise, Leon will stress the person, time or place. By using a certain accentuation, he tries to structure the information. Information structure deals with how to process verbalized information to make it appropriate to the state of attention and knowledge of the participants in the discourse. This is also called information packaging. When examining the structuring of information, three aspects are particularly theoretically interesting: the interaction of the relevant formal levels (phonetics, phonology, morphology, syntax, semantics, the choice of lexical means and the composition of texts), the general cognitive processing of the information structure and a cross-linguistic typology for information structural devices. "On the one hand, our question is a linguistic one because we ask for the linguistic means to package information. On the other, they are generally cognitive because the non-linguistic elements refer rather to the discourse's object, to background knowledge and context," Zimmermann explains.

"The project shows not only the bridge between language and cognition but also between Potsdam and Berlin."

The four-year project – and thus one of the shorter ones – of Prof. Katharina Spalek from the Humboldt-Universität zu Berlin and Prof. Isabell Wartenburger from the University of Potsdam illustrates the intersection between verbal and non-verbal elements. "It shows not only the bridge between language and cognition but also between Potsdam and Berlin," Wartenburger says, introducing her project. "There is an intensive exchange between colleagues but eventually each team works on

THE SCIENTIST

Prof. Isabell Wartenburger is Professor of Patholinguistics at the University of Potsdam and project leader at the Collaborative Research Center "Information Structure".

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Prof. Malte Zimmermann is Professor for Semantics at the University of Potsdam. Since 2009 he has been the director of the Collaborative Research Center 632 "Information Structure".

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Photos: Fritze, Karla

its own sub-discipline." Together with her colleagues, the researcher, a junior professor when she assumed the project management, analyzes the effects of contextual information on processing language. Wartenburger and Spalek proceed from the observation that context cannot be communicated only linguistically, for example by using a certain sentence or sentence structure, but also by visual context or stimuli. This Potsdam sub-project deals with the processing of object clauses, i.e. clauses that begin with the accusative case. In their study they used for instance the sentence, "The owl [acc.] paints the hedgehog [nom.] in the park". You would normally introduce a simple statement with the subject and say, "The hedgehog [nom.] paints the owl [acc.] in the park." The researchers wanted to find out experimentally how context influences the processing of this atypical word order in the listener.

INTEGRATED GRADUATE SCHOOLS OF COLLABORATIVE RESEARCH CENTERS

The goal of the Integrated Graduate School is to promote scientific independence and qualification of PhD students at collaborative research centers. This will make collaborative research centers more attractive for young academics.

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While the subjects were sitting in front of a monitor and listening to a number of sentences beginning with an object and subject over a loudspeaker, their brain activity was recorded using electroencephalography (EEG). Atypical word order irritated the subjects; brain processing became more complicated. Using an introductory sentence or a visual stimulus facilitated processing. Eventually they compared whether the preceding contextualizing sentence, "What about the owl?" had the same effect as a visual stimulus, for instance a picture with a

Test person with an EEG cap.

Photo: Neurocognition of Language Group

hedgehog and an owl. "We want to find out whether visual context can influence understanding information structure by controlling attention," says Wartenburger. She finds it plausible that context placement also works visually but no studies have been done so far. The tests that have been conducted show that arranging verbal and visual conditions in a comparable way is more difficult than expected.

If they manage to prove the assumption that visual context really does minimize processing problems, the results could be translated into practical application like in the therapy of stroke patients with speech disorders (aphasia). "We know that aphasia patients have problems with these object clauses. They often wrongly interpret these object-initialized clauses," the Potsdam researcher explains. Whether these project findings will be relevant for therapy and ultimately for everyday communication has to be examined in due course. For a start, Prof. Wartenburger and her staff will continue to back up their assumptions with scientific evidence over the remaining two years of their project.

"We want to examine if it is also possible to implement the understanding of information structures visually."

The SFB has already gained academic recognition, Zimmermann explains. "I think the SFB's work has already been successful because a uniform terminology in the international research on information structure had not existed beforehand. When someone talked about focus or topic, you never knew whether it meant the same. The SFB has considerably contributed to a uniform usage. Now they say: 'We do it like the Potsdam people.'"

The first-ever analysis of many languages with regard to information-structural phenomena is also an important empirical achievement of the SFB. During the first stage of funding, 16 languages were classified in a large-scale project. Among them were Australian, various African and Central American languages with the aim of preparing a comparable linguistic corpus. The researchers also somewhat successfully identified cross-lingual trends. "As opposed to German, very few languages use focus accentuation to structure information. Our initial hypothesis was that these languages accentuate differently," says Zimmermann, who took part in this project himself. "We, therefore, assumed that accentuation was fundamental to successful communication. One unexpected finding was that some languages do not do this or do so optionally."

"There was a big project that classified 16 languages worldwide."

The SFB "Information Structure" ends in June 2015, but that does not make its current director melancholic. "Twelve years are enough to plough through a theme. After that it is time to head for new shores."

SOPHIE JÄGER

Figure: Commissioned by the Collaborative Research Center „Information Structure"

Arabidopsis blossom.

The Appeal of Difference

Kovalevskaja awardee Dr. Kerstin Kaufmann wants to understand plant development and evolution

Photo: AG Kaufmann

Who doesn't dream of the jackpot yet waits in vain? But fortune favors the brave. Biologist Dr. Kerstin Kaufmann was one of 14 Sofja Kovalevskaja winners in 2012. She received 1.6 million Euros with this award, for which she has worked very hard. She has used the money to establish her own research group focusing on plant development at the University of Potsdam.

Even as a little girl Kerstin Kaufmann was interested in everything that blossomed, grew and crawled in her parents' garden. In Mellin, a village of 200 people in Sachsen-Anhalt, she was in contact with nature at every turn. Biology lessons inspired Kaufmann, now 36, to pursue these interests. "Quite early it was not enough for me to only know the names of plants and animals." She wanted to understand their differences, which was why she decided to study biology, initially in Braunschweig, and even back then she focused on plants. After her undergraduate studies, she continued her studies in Sweden, where she first researched so-called transcription factors, extremely important for plant development and evolution. "I have always been driven by scientific curiosity. This is why I went to Uppsala," says Kaufmann. At this Swedish university with a long tradition she was able to establish contacts with experts in her discipline.

Whether in Sweden or in Jena or later in Cologne, she always focused on plant research, specifically evolutionary plant developmental biology and flower development. When she was working on her doctoral thesis she realized "that it is important to analyze model plants with regard to the function of transcription factors and their networks to understand evolution," she says. Kaufmann moved yet again to pursue her research interests. The Dutch Wageningen University offered her a position with every possibility to continue her scientific approach. "There are many methods to study molecular interactions but few look into the plants' tissue," according to Kaufmann. She has established and optimized methods of determining the DNA binding sites and interaction partners of transcription factors in plant development.

Evolution remains an area of interest to this day. She has led the research group Plant Developmental Biology at the Institute of Biochemistry and Biology since the end of 2012. Prof. Bernd Müller-Röber, with whom she has had research contact for a while, encouraged her to apply for the Sofja Kovalevskaja Award, and so she did. It became clear in April 2012 that she had won the prize and thus 1.6 million Euros. At this time she was still working as a group leader and assistant professor in the Netherlands. "After intensive deliberations I decided in favor of Potsdam and the prize," Kaufmann says. Her husband, a Spanish bioinformatics specialist, works in Berlin, and both moved to Potsdam-Golm.

"I have always been driven by scientific curiosity."

Six other scientists, PhD students/and postdocs, as well as one undergraduate student comprise the research group. They come from the Netherlands, China, Italy, and Germany. The international composition of the team is no coincidence. Over the next five years the researchers can break new scientific ground and implement their ideas. They have ambitious aims. They want to understand how plant diversity is "encoded" in the genome and how this code is read and implemented. The researchers are investigating how developmental processes are controlled at the molecular level, from the DNA sequence to the mature flower. They examine model plants and compare plants. In a climate chamber the researchers grow the plants – the model plant Arabidopsis thaliana and closely related species – to compare developmental processes and examine genes significant to these processes. Not all genes are equally important in

THE SCIENTIST

Dr. Kerstin Kaufmann studied biology in Braunschweig, Uppsala (Sweden), Jena, and Cologne. In 2012 she received the Sofja Kovalevskaja Award of the Alexander von Humboldt Foundation. Since December 2012 she has led the young academic group Plant Developmental Biology at the Institute for Biochemistry and Biology of the University of Potsdam.

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SOFJA KOVALEVSKAJA AWARD

The Sofja Kovalevskaja Award of the Alexander von Humboldt Foundation is one of the most valuable awards in Germany with up to 1.65 million Euros. It allows the recipients from abroad to spend five years working on a research project at an institute of their choice in Germany and to establish their own research group. The award is granted for creative approaches to research. Scientists and scholars who have completed their doctorates within the last six years are eligible to apply.

The award is named after the Russian mathematician, Sofja Kovalevskaja, who was born in 1850. She was appointed to a full professorship in mathematics at Stockholm University in 1889.

Photo: Kaufmann, Dr. Kerstin

Biologist Dr. Kerstin Kaufmann examining plants in the lab and on the computer.

plant development. The research group is concentrating on key regulators and their target genes.

A day in the life of the young scientists is mainly a combination of laboratory experiments and data analyses. They work on the molecular level using molecular and biochemical methods in the laboratory to analyze gene functions. "It is important to conduct the experiments exactly to obtain relevant data," says Kaufmann, because after the laboratory work, the data has to be evaluated on a computer. The researchers look for binding sites of transcription factors in the genome and want to know why, when, and how a gene is regulated and how significant that is for the development of the plant. The group works with genome-wide datasets, which requires bioinformatic expertise. The University of Potsdam, with its bioinformatics research group, provides optimal conditions for training and cooperation. The group's collaboration with the Max Planck Institute of Molecular Plant Physiology in Golm provides many advantages, for instance with proteomic analyses. Kaufmann also hopes to establish and intensify the collaboration with her colleagues at the University.

"For the next five years the researchers can break new scientific ground and implement their ideas."

Supervising PhD students is an interesting challenge for the awardee. "You need completely different skills for it than doing the experiments yourself," says the young researcher. You have to coach and motivate your students individually and give them time and space for their own development. She wants to help them to understand that writing a dissertation is not child's play and that almost everybody has nadirs to overcome in the process. In the final analysis, a doctorate means working as an independent scientist. You have to develop your own ideas and pursue them to the end, even if not everything goes smoothly. A well-organized schedule is necessary to balance all tasks as a group leader. Kaufmann's new home also has a little garden where she can be close to nature, which she enjoys very much.

"In the final analysis, a doctorate means working as an independent scientist."

DR. BARBARA ECKARDT

Photo: Fritze, Karla

In the Midst of Life

Prof. Michael Kühn focuses on groundwater

Being in touch with the real world is a very important motivation for Michael Kühn's research. He is, therefore, very happy about his successful application for a joint professorship of hydrogeology at the University Potsdam and the Helmholtz-Centre Potsdam GFZ - German Research Center for Geosciences.
His research is on groundwater in Earth's crust – the most prevalent and widely used raw material worldwide – and all factors that might affect it. It is a particular challenge for researchers to analyze the impact of utilizing georesources in greater depths on the drinking water in shallow areas, for instance CO_2-storage, geothermal energy, gas and energy storage sites. Kühn and his team concentrate on "the dynamic interaction between shallow and deep groundwater systems and their quantitative description". For this they use computer-aided process simulations to understand the balance and exchange of matter in groundwater systems as well as the quantification of their available resources. Kühn, who studied chemistry, has deliberately focused his research work outside of the classical drinking water hydrogeology. "In the last years it has become more and more important to raise the question about the consequences of a stronger utilization of the deeper bedrock." Among other things, it has to be decided whether unconventional gases that are difficult to access should be extracted from rock by using controversial fracking technology and what the consequences will be. Kühn's aim is to connect drinking water hydrogeology close to the surface with the deep "reaching" reservoir engineering, two fields that have so far been separated. Only in this way will it become possible to assess the potential and risks of each project.
This problem is especially significant and volatile in the federal state of Brandenburg, which has a wide range of renewable energy but also lignite resources. Kühn wants to find applicable solutions in collaboration with partners from the industry. Drinking water, the most important food, is irreplaceable. Given that groundwater is the only access to drinking water for people in many parts of the world, the scientist and his team want to contribute to maintaining and improving the natural resources of mankind. It is important to them that they take part in "finding answers to questions relating to the future in the area of conflict between human beings, energy, earth and environment."
Before Kühn joined the GFZ he had also worked in Australia, where he used the "computer to prospect for gold". Computer programs helped to "retroactively" explore the formation of ore deposits. Since 2007 he has been working in Potsdam, first at the GFZ as the principal research scientist in the section Environmental Geotechnique and later, until 2012, as Head of the Centre for CO_2 Storage, where he conducted research on the geological storage of carbon dioxide and examined the processes of CO_2 injection and migration in the subsurface.
Michael Kühn is among those jointly appointed professors who want "to belong and integrate" both at the cooperating institutions and the University of Potsdam. Apart from his research, Kühn enjoys teaching. He already supervised students when he was a PhD-student himself. "At that time I realized that I really enjoy working with young academics." This is still true today. He regards it a challenge and a pleasure to impart knowledge and experience and to motivate. And moreover: "Nobody learns more from a lecture than the lecturer."

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PEARLS OF SCIENCE

Each of these research institutes is unique. Together they want to make better use of their potential. Eighteen leading scientific institutes in Brandenburg followed the University of Potsdam's initiative in 2009 and joined forces within "pearls · Potsdam Research Network". They want to use synergies dovetailing research and education even more closely. Furthermore, they want to raise third-party funds more successfully and develop fields of research geared to the future.
www.pearlsofscience.de

Photo: Fritze, Karla

Photo: Ash, Nick

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Scattered Heritage

German-Jewish Culture around the World

A chipped cup with a faded golden rim. An old teddy bear, a yellowed, shabby tablecloth. A poem, a letter, a historical Goethe edition – all these items accompany Elke-Vera Kotowski in her academic work. The Potsdam historian has also traced these things over thousands of kilometers and across countries and continents. Kotowski completed her doctorate at the University of Potsdam in 2000 and has focused on European-Jewish culture and cultural history since then. After her dissertation she found her academic home at the Moses Mendelssohn Center, where she has dedicated herself to an almost detective-like search for evidence.

She persistently traces the stories of German-Jewish emigrants who found a new home in America, Asia, Africa, Oceania and Europe. The project "German-Jewish Cultural Heritage" started about two years ago and could be summarized as a triad of discovery, collection and conveyance. Since 2011 researchers and students have been tracing the lives of German-Jewish emigrants in this research project funded by the Federal Commissioner for Culture and Media. Foreign ministry officials have supported the Potsdam researchers by asking their colleagues in 60 embassies for help. Of particular interest were countries with a long immigration history and those through which or to which Jewish people sought exile.

Photo: Fritze, Karla

The feedback was varied. In Argentina, for instance, they were very successful. Particularly in Buenos Aires it was immediately apparent that people of various ages and backgrounds intensively engage in this issue. Embassy employees have been involved in many German-Jewish projects. It went almost without saying that the opening event for the German-Jewish Cultural Heritage Program took place in the Argentinian capital in March 2012. Kotowski remembers this event very well, even more than a year later: "This was a very special atmosphere. Nobody of us knew how they would receive us. We speculated a lot about how many people would be interested in our project and how they would feel meeting us. Actually we all agreed that 20 or perhaps 30 visitors to the German embassy that evening would be a great success. As a matter of fact, almost 100 guests accepted the invitation to the researchers' information meeting. "In the course of the evening an elderly man stood up and explained in Spanish that he once had promised himself to never again set foot on German soil. He had broken his promise because he had accepted the invitation to the German embassy. He had also promised never to speak German again and then changed to his mother tongue with tears in his eyes. This was very moving indeed." There were many special moments like this. The reaction to the intentions of the Potsdam researchers was immense, almost overwhelming.

"Then he changed to his mother tongue with tears in his eyes. This was very moving indeed."

Important historical artifacts of Jewish culture all over the world are at risk of being irrevocably lost. In Buenos Aires, for example, a Jewish aid organization ensured that the immigrants in the 1930s had a roof over their heads and a warm meal. The archives of this organization have filing boxes filled with refugees' names, addresses, ages and places of origin, a real treasure for any historian. When the organization moved into a new, smaller office the question was what to do with the filing boxes. Should they be thrown away? "When we were asked whether it is worth keeping theses boxes, we advocated for their safe storage. This is authentic history reflecting stories we have to preserve," says the project leader. More and more German-Jewish emigrants and sometimes their descendants willingly told the Potsdam researchers their life stories. "On my travels I repeatedly had the impression that we had come at exactly the right

All the threads of the international project come together at the Moses Mendelssohn Center in Potsdam.

Photo: Fritze, Karla

The Port of Hamburg was the "gate to the world" during the 19th century. Between 1850 and 1900 over 5 million emigrants left Europe from here – for good. Among them were many Jews from Germany and other European countries.

Postcard: Habour and St. Pauli Landing Stages, about 1900

THE PROJECT

The project **"German Jewish Heritage"** is devoted to recognizing, registering and preserving German-Jewish cultural heritage. It focuses on seeking traces of the paths of German Jews as a consequence of emigration. The term 'cultural heritage' includes material and intellectual heritage that German-speaking Jews brought along into their new home countries both for the 19th century and the profound caesura in 1933. An Internet platform and a database currently being developed are to support the cooperation of all relevant institutions and ensure a transnational exchange. The project should encourage public access to as many assets of German-Jewish culture as possible. This will allow universal access to the historically valuable primary sources. The researchers' aim is to ensure long-term access to these sources for future generations as well as to use the acquired knowledge sustainably.

time with our questions and search." Kotowski is stitching these life stories into a historical "patchwork blanket" that describes an under-researched aspect of German-Jewish history that has got little attention. It describes the very personal consequences of world history on the emigrants' lives, their partners, children and ultimately subsequent generations. Especially third or fourth generation relatives often search for their own identity, according to the historian. Where are my roots? What culture shaped me? Which traditions has my family maintained?

The researchers are trying to find out to what extent German-Jewish emigrants stuck to Jewish culture in their new home country. This also determined whether they contributed their values and experience to the culture of their new homes. A transatlantic correspondence between members of the German-Jewish Guttmann family in Austria and their emigrated son/brother was very illuminating for Kotowski in this respect. A box containing these letters – a weekly exchange of news between 1926 and 1956 – was given to an American colleague a few years ago after being discovered in an attic. They were then analyzed together with

"What were European Jews thinking during these years? What bothered or concerned them?"

students in a seminar at the University of Potsdam. It excites and interests the historians to find out if and how historical events are reflected in this family's correspondence. What were European Jews thinking during these years? What bothered or concerned them? Did the anti-Jewish riots in Germany in 1933 play a role? What about the annexation of Austria in 1938? Every Saturday a letter crossed the Atlantic. The analysis of the man who immigrated to New York is very clear-sighted. While the mother and brother repressed the everyday realities – persecution and discrimination – the emigrated son/brother warns them of upcoming developments. The Viennese relatives eventually fled to the United States, too. The historical letters provide information on how quickly the immigrants integrated into the American multicultural society. After a short time they were exchanging news (in writing) in English. The correspondence between relatives in the old and new worlds contains lines like, "We have become almost real Americans." Integration did not happen so quickly and uncomplicatedly in many other countries of exile. This might be the reason why memories of the lost homeland and relatedness were preserved so much more.

"It remains fascinating for historians how the cultures mutually influenced each other."

It remains fascinating for historians how the cultures mutually influenced each other and to see how different cultural traditions can meld into a new common identity. Kotowski explains, "We have repeatedly discussed what the term 'cultural assets' means. Is a poem an object of cultural value? Yes. A cuckoo clock, a trading picture and a small volume of Rilke poems as well." The Potsdam researchers concentrate not only on emigrants who had to leave Germany after the Nazis came to power but also on those who emigrated in the 19th century. When comparing these two groups, it is interesting to analyze whether a visible difference existed in sticking to their original identity between the early emigrants and those expelled by the Nazis.

A database will form the basis for long-term collaboration and exchange on an international level, which will, according to the Potsdam historians, make the collected items universally accessible one day. Only by doing this can it be used for various research contexts – some not yet even anticipated – that deal with the theoretical foundations of the causal and effective history of German cultural history and the influence of Jewish artists. The aim is to bring together institutions, associations, communities, research centers and museums worldwide. All those dealing with the preservation of German-Jewish cultural heritage will be systematically connected and invited to a long-term cooperation. Kotowski sees this as an investment in the future, "I think that it is an effective prophylaxis against the impeding cultural oblivion, which would ultimately mean the loss of identity. We are interested in new forms of preservation and in how modern communication technology can help us save sources. The Internet and modern databases can be very useful for this. Of course, this is expensive, but if we are unsuccessful, the Holocaust will be only a historical footnote in 50, 100 or 500 years."

The project "German Jewish Heritage" is not a retrospective one-way road. In addition to seeking traces and looking into the past, it has to do with a critical approach and questions regarding the existence of a living German-Jewish culture in the Federal Republic of Germany. It is about the question if an almost extinct culture and lifestyle will be newly established and a self-awareness is developing based on the emigrants' stories. Not only Jewish communities are confronted with these questions. The German majority society is also obliged to answer these questions and to deal with the influences and effects of German-Jewish history and development as an integrated component of the overall history of Germany.

BIRGIT MANGELSDORF

THE SCIENTIST

Dr. Elke-Vera Kotowski studied political science and literature, philosophy and cultural science in in Duisburg und Berlin. Since 2000 she has been a research assistant at the Moses Mendelssohn Center for European-Jewish Studies.

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Photo: Fritze, Karla

Suspended Particles

Mathematician Prof. Christine Böckmann examines particle movements

Air pollution inexorably belongs to our everyday life. The causes for this are complex, including volcanic eruptions and fires as well as industrial emissions. To examine the impact we need not only natural scientists like physicists but also mathematicians. Prof. Christine Böckmann is among those who deal with mathematical methods for inverse problems and their application in atmospheric research.

After Böckmann had finished her studies of mathematics she wanted to do applied research. "I did not want to stop at the mathematics I had studied." And so she turned her attention to numerical mathematics. Already in her dissertation she developed algorithms that could be applied in natural sciences. Now she is concentrating on the interdisciplinary research in the topical field of parameter identification for aerosol particles in the atmosphere, which play an essential role in global warming and cooling. Böckmann's ability to pursue mathematical theory and application at the same high level of quality has been greatly valued among experts.

By the 1990s, the scientist had already taken part in a project funded by the Federal Ministry of Research. This project dealt with mathematical methods for solving specific problems in the industrial and business sectors. This was when she started collaborating with the regional LIDAR group of Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research (AWI) in Potsdam. The group uses its technology to observe climatic development in the Artic, in Ny-Ålesund on Spitsbergen. A LIDAR ("light detection and ranging") system is an optical radar that sends pulsed laser beams of different wavelengths into the atmosphere, where air molecules and tiny floating particles – the aerosol particles – scatter the electromagnetic radiation. The intensity of the reflected light is measured dependent on time. From a mathematical point of view, "it is a non-linear inverse scattering problem. Inverse means that the size distribution of the aerosol can be determined indirectly by the laser light reflected on the particles and captured by a detector", Böckmann explains. Her team had to deal with the "inverse scattering problem" when they first started their collaboration.

THE SCIENTIST

Prof. Christine Böckmann studied mathematics in Dresden. She did her doctorate at the Dresden University of Technology in 1984 and habilitated at the University of Potsdam in 2002. She is an associate professor at the Institute of Mathematics at the University of Potsdam. Her research interests include the numerics of inverse problems and applications in atmospheric physics.

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Photo: Schmid, Joann (Alfred Wegener Institute for Polar and Marine Research)

The use of LIDAR technology for atmospheric remote sensing turned out to be successful. Using a model, the mathematicians calculated other microphysical particles properties from the optical data and measured LIDAR signals. Since this problem is also relevant for studying global warming, the German LIDARNetz developed into a Europe-wide network. In 2000, EARLINET (European Aerosol Research Lidar Network) was established, followed by EARLINET-ASOS (European Aerosol Research Lidar Network – Advanced Sustainable Observation System). The scientists' main goal has been to compile a comprehensive database for the aerosol distribution on a continental scale.

"The aerosols we observe influence weather and climate decisively."

Böckmann's PhD student Lukas Osterloh had the opportunity to conduct an extensive simulation study on parallel computers at the Supercomputing Center in Barcelona, which would have taken years with the technology available in Potsdam. The mathematical model was able to be optimized and the relevant software has since been developed. During the first stage, the scientists determined microphysical parameters for spherical particles from the optical LIDAR-profiles. Later they managed to extend the one-dimensional model to a two-dimensional one.

"The aerosols we observe decisively influence weather and climate", Böckmann says. When analyzing climate models they examine not only aerosol particles but also clouds. To improve these models, scientists of the "aerosol-group" joined forces with those of the "climate-group". They want to inspire young people to grapple with these new ideas. This is how funding was raised for a project within the Marie Curie Actions at the EU. The aim of the four-year project is the training of young doctoral candidates and postdocs for atmospheric remote sensing (ITARS – Initial Training for Atmospheric Remote Sensing). It started in April 2012 and includes ten groups from various countries, one of which works at the University of Potsdam.

The effects of the 2010 eruption of volcano Eyjafjallajökull reached far beyond Iceland. The volcanic ash thrown up in the atmosphere disrupted air travel to an unprecedented extent in much of northern and central Europe. The optical radar LIDAR can help identify the particles in volcanic ash. This has a practical advantage because the ash is not a problem for air travel per se. Only certain types of particles are "harmful" to aircraft engines. In any case there are always more non-spherical particles, i.e. those which do not have a spherical shape but any other shape. The mathematical models used so far have not been applicable. The aim is to develop new ones for non-spherical particles, for example from Sahara dust or volcanic clouds. For this you need a database of the scattering properties of such particles.

"Christine Böckmann calls it a generation project."

The scientists first want to analyze the reaction of the mathematical models on non-spherical particles but the mathematicians are still only at the beginning here. Böckmann calls it a generation project. The question is also of great interest for her because sending particles into the atmosphere to influence the climate, for example to decrease the temperature or to produce rain, is being considered. Questions of ethical and legal consequences do however cloud this issue. Against this – eminently practical – background it is important for Böckmann to continue her work on the project. "I think we are not yet at the point where we can foresee the consequences of such interventions into nature."

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LIDAR of the research station in Ny Ålesund on the island of Spitsbergen.

Photo: Schmid, Joann (Alfred Wegener Institute for Polar and Marine Research)

THE PROJECT

Initial Training for Atmospheric Remote Sensing

Participants: Groups from Romania, Greece, Spain, Italy, Great Britain, the Netherlands, and Germany as well as five small- and medium-sized companies from Greece, Italy, France, and Germany

Duration: 2012–2016

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