

# MAGAZINE

of Heinrich Heine University Düsseldorf

## No children, no money, no internet

Study identifies  
19 vulnerable regions  
in Germany

BIOLOGY

Climate change  
research

MEDICINE

Brain surgery – on fruit  
and in real life

FACULTY OF LAW

Paintings  
tell stories

hhu.

# 3 — 2019

04 EDITORIAL

## Campus

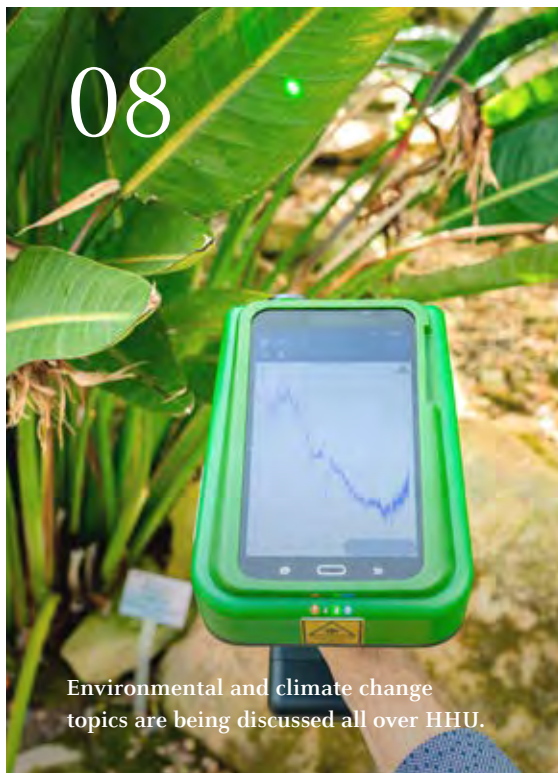
05 Thousands of curious visitors at Science Night



# 05

Inspiring transfer of research results at Science Night.

PHOTO HHU/WILFRIED MEYER



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Environmental and climate change topics are being discussed all over HHU.

PHOTO CHRISTOPH KAWAN

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in Germany



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## Editorial



Dear readers,  
 Social cohesion is a topic that currently deeply concerns Germany – German politics, the country’s economy and German society as a whole. Some regions in the Federal Republic are referred to as ‘left behind’ while at the same time other areas and cities are booming. The imbalance of living conditions in Germany and the question of how to ‘save’ disadvantaged regions are topics of a study conducted by a team of Heinrich Heine University’s Faculty of Business Administration and Economics under the leadership of Prof. Dr. Jens Südekum. The current issue of the MAGAZINE features this study as well as further research projects and activities of the other HHU faculties, one of them a lecture series on climate change – covering another topic of high social relevance and actuality.

By reporting about these projects and activities, this issue of the MAGAZINE represents one step on the way to achieve HHU’s long-term goal – to carry research and science into society. This was also the purpose of the Science Night that took place at the Haus der Universität in Düsseldorf’s city center last September and which attracted thousands of visitors. Impressive photos, amongst other things, bear testimony to the intensity of this direct exchange between the scientists and Düsseldorf’s citizens in this issue of the MAGAZINE. I hope you have an inspiring read.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Stefan Marschall". The signature is fluid and stylized, with a long horizontal stroke at the end.

Prof. Dr. Stefan Marschall  
 Vice-President for International Relations and Science Communication



# Thousands of curious visitors at Science Night

Inspiring transfer of research results

BY ACHIM ZOLKE

“Do you know your risk for diabetes?”, “Let’s play a brain game!”, “If you’re interested I’ll show you how fires spread within a building”. With a broad spectrum of invitations, scientists lured visitors to their booths on Friday, 13 September 2019. Visible proof that science can inspire the masses: about 10,000 visitors flocked to the Haus der Universität and to an adjacent 900 square metre transparent event marquee at Düsseldorf’s Schadowplatz.



The main objective of the event was to introduce Düsseldorf as a place of outstanding research to a large audience”, explains HHU President Prof. Dr. Anja Steinbeck. “And it was a full success: we were able to attract thousands of people eager to find out more about how science works and why we can trust science. Tonight, we were able to introduce them to a large spectrum of experts from different fields - that’s when the transfer of knowledge is fun and this elaborate event a tribute to our city. I was particularly impressed by the number of young people here tonight and by how interested they were in even the most advanced science topics”. The President promised: “We’re going to do this again. And it’s not going to take another four years this time”!

## Current Challenges

In about 60 different formats – science talks, experiments, lectures, info booths – researchers from various disciplines explained to the visitors what they were currently working on, which scientific questions they were confronted with and what challenges they were currently facing in their respective fields. The night was made perfect by an entertaining and sometimes ironic science slam at midnight. Even at this late hour every seat in the lecture room at the Haus der Universität was taken. Climate change was a recurring theme throughout the evening. Experts from various fields such as biology, chemistry, medicine or law answered questions and discussed effects and counter-measures. Other, equally controversial, topics that were open to discussion were for example artificial intelligence, genetic engineering, gender neutral writing and speaking, but also the latest findings in evolutionary biology, digitalisation and political sciences.

“I was particularly impressed by the number of young people here tonight and by how interested they were in even the most advanced science topics.”

— HHU President Prof. Dr. Anja Steinbeck

## Brain Research

One of the more prominent topics that night was brain research. A Forschungszentrum Jülich research centre booth not only demonstrated how brain waves are measured but also how to interpret them. At another booth visitors were able to test for themselves how the brain processes mistakes and several other booths discussed the questions how virtual reality and stimulation may deceive or stimulate our brains.



## Science Night

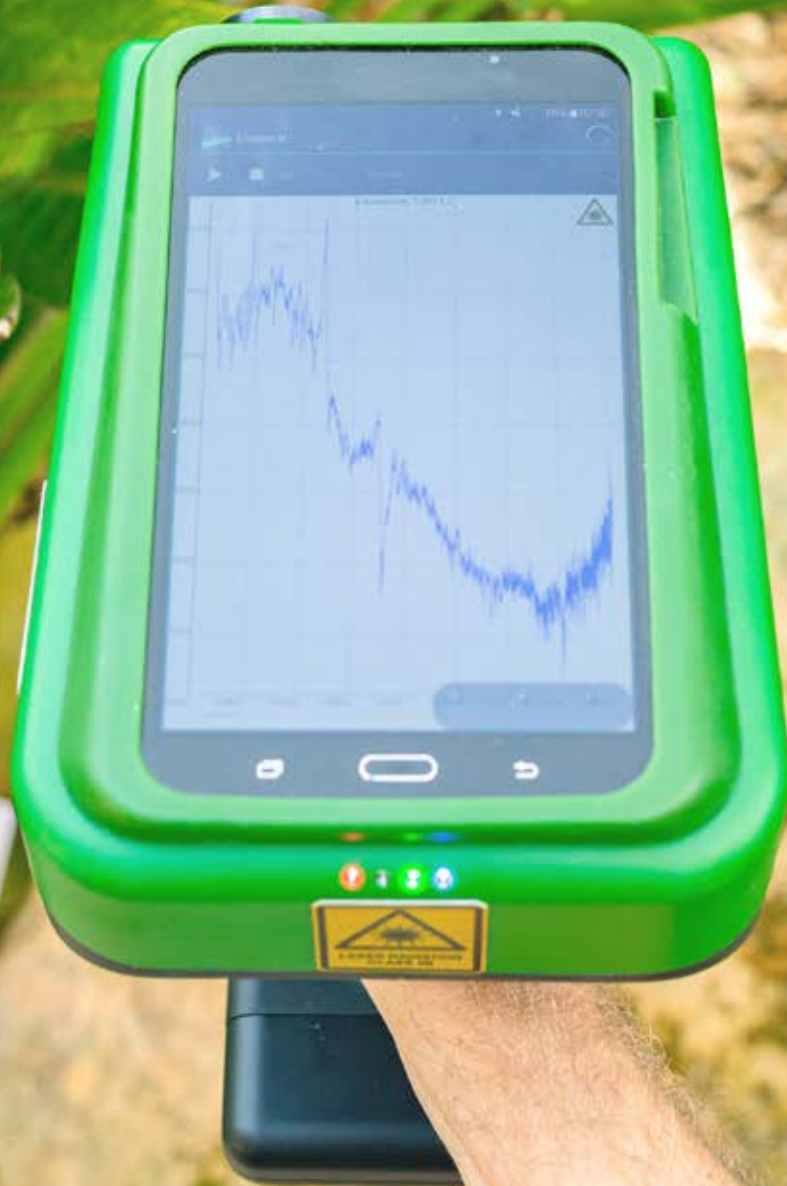
After 2013 and 2015, this was the third Science Night in Düsseldorf. The 2019 event was initiated and organised by Heinrich Heine University Düsseldorf which also provided most of the topics. Six partner institutions also contributed topics and other interesting items on the agenda: the German Diabetes Center Düsseldorf, the Forschungszentrum Jülich research centre, the University of Applied Sciences Düsseldorf, the iron research centre Max-Planck-Institut für Eisenforschung, the Robert Schumann Hochschule conservatory and the WHU – Otto Beisheim School of Management.



PHOTOS WILFRIED MEYER, CHRISTOPH KAMAN AND LARA MÜLLER



A portable Raman spectrometer can show if plants are suffering from heat stress or hydric stress – here the analysis of a *strelitzia reginae*, the bird-of-paradise flower.





Climate change lecture series

# Environmental research and teaching relating to climate change at HHU

BY ARNE CLAUSSEN

Various scientific disciplines can contribute different aspects to the highly topical subject area 'climate change'. During the 2019/20 winter semester, Heinrich Heine University Düsseldorf organises a public lecture series with the title *'Klimawandel und Ich'* (What climate change means for me) that brings together the various disciplines. But environmental and climate change research issues are also being addressed elsewhere in teaching and research at HHU.

A plenary at HHU in June 2019 gave the impulse to this lecture series“, remembers Prof. Dr. Michael Schmitt of HHU's Institute of Physical Chemistry. Together with biologist Dr. Nicolas Schmelling – both members of 'Scientists for Future' – he made use of this momentum. For their interdisciplinary approach they were able to win speakers from all HHU faculties as well as from other universities and organisations. The lecture series highlights very different aspects of climate change: from the physical-chemical influencers of our climate and the various causes of anthropogenic climate change to ethical, legal, medical and political aspects up to the measures that have to be taken regarding mobility, energy supply and sustainable economic management. Schmelling is happy about the success: "The lecture hall is always full to the brim, over 750 students have enrolled and many Düsseldorf citizens attend the lectures as well". Many of the 14 lectures in this series were recorded and can be watched on HHU's Mediathek. "Environmental topics are very popular among my stu-

dents”, says Prof. Schmitt, who’s been offering the module ‘environmental chemistry’ as part of the Master’s degree course in chemistry on a regular basis. “Even though this is optional, the major part of the students attends the module, over 70 this year.” The module consists of lectures and exercises plus a practical or project course.

## Environmental topics are popular among students

Schmitt: “The students have one semester to complete a small research project – this has led to some very exciting results in the past”. One of the student groups tried to find out whether solvents, which are used in great quantities by HHU’s Department of Chemistry, can be recycled. They usually get disposed of after use and new solvents have to be procured – a considerable cost factor. In cooperation with the individual institutes, the students determined the institutes’ demand in various substances and asked them to what extent they were able to recycle these substances. Schmitt: “It would make sense to pur-

“The students have one semester to complete a small research project – this has led to some very exciting results in the past.”

— Prof. Dr. Michael Schmitt,  
Physical Chemistry



The lecture series “Klimawandel und Ich” is met with a lot of interest among students: more than 700 students have enrolled and numerous Düsseldorf citizens also attend the lectures.





Dr. Nicolas Schmelling (left) and Prof. Dr. Michael Schmitt organise the lecture series “Klimawandel und Ich” which takes place during the 2019/2020 winter semester at HHU.

chase and run a recycling facility“. One project currently analyses the potential of installing photovoltaic cells on campus: how much solar electricity can be generated on HHU grounds? Another project group is planning to measure how well different HHU buildings are heat insulated with the help of an infrared camera and if the consumption of thermal energy can be reduced by further insulating the buildings.

## Laser spectroscopy

Prof. Schmitt’s interest in climate matters was, amongst other things, triggered by his research work. He is an expert for high resolution laser spectroscopy which he uses to analyse molecules and to identify them: “This procedure has great potential for air and water environmental chemistry because trace gases can be detected very quickly and precisely with the help of a spectroscope“. One of those gases is NO<sub>x</sub> which featured prominently in the media last year in connection with the diesel engine scandal. Schmitt has supervised a number of research papers by Master’s degree students on environmental topics. One paper examined how soil, with the help of air, can be stripped from harmful substances which are then rendered harmless by degrading them to carbon dioxide and water under UV light. Another student was able to demonstrate on *Arabidopsis thaliana* – also known as mouse-ear cress or thale cress – that stress in plants, for example the lack of water, can be made visible by performing a so-called Raman spectroscopy on the leaves.

This is just a fraction of the research work at HHU directly or indirectly addressing climate change. The changing climate is going to have a significant impact on the food supply of a growing world population. Farmers are facing rising temperatures, droughts, erosion and salinisation of the soil as well as extreme weather events – challenges our current crops aren’t adapted to. The effects of climate change will also lead to a decrease in areas suitable for farming. These challenges are among the main drivers which motivate the CEPLAS cluster of excellence at HHU.

Together with their colleagues from Cologne and Jülich, the CEPLAS scientists are working to establish a scientific basis for tomorrow’s plant breeding. They want to be able to predict which genetic characteristics food plants such as rice, wheat and corn must possess to be more resilient to the effects of climate change. By reducing crop losses and at the same time reducing the size of the farmland needed to grow the crops, agriculture becomes more sustainable and the loss of biodiversity due to soil sealing is limited. CEPLAS offers a variety of different research and work experience projects for students.

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FOTO PHOTOCASE.DE - ANDREASF.



No children,  
no money,  
no internet



## Study identifies 19 vulnerable regions in Germany



BY VICTORIA MEINSCHÄFER

Very bad roads, not enough doctors, low tax revenue, slow internet connections, an ageing population: in 19 out of 96 German regions the overall situation is appalling. “This lack of infrastructure leads to negative reactions among the local population. The people feel unappreciated when the state obviously is not interested in supplying a certain amount of public goods,” says Prof. Dr. Jens Südekum of DICE (Düsseldorf Institute for Competition Economics), one of the authors of the study *Die Zukunft der Regionen in Deutschland. Zwischen Vielfalt und Gleichwertigkeit* (The future of Germany’s regions. Between diversity and equality) which he published together with the German Economic Institute (IW Köln) in the summer of 2019.

“A large part of the funds available are used for Hartz IV payments (basic security benefits for job seekers) which means that hardly anything is left to pay for repairs in schools, to repair roads, or to maintain recreational facilities.”

— Prof. Dr. Jens Südekum,  
Düsseldorf Institute  
for Competition Economics

The media's interest in regional politics has risen significantly since 2016.



PHOTO KERSTIN MÜLLER

The study looked into three dimensions of the 96 spatial development regions: the economic indicators, depicting first of all the economic situation of the private households, the demographic situation i.e. the number of children per woman, life expectancy and the average age of the population plus the infrastructural situation. “It gives us an indication of the effectiveness of the public authorities and the availability of broad band internet connections is an indicator of modernity and the capacity for innovation”, says Prof. Dr. Michael Hüther, co-author of the study and Head of the German Economic Institute. He adds: “We also considered real estate prices because they are indicators for how attractive a given location is.” This multi-dimensional evaluation was the basis used to establish a vulnerability index which delineates the regional development. According to this evaluation, one fifth of

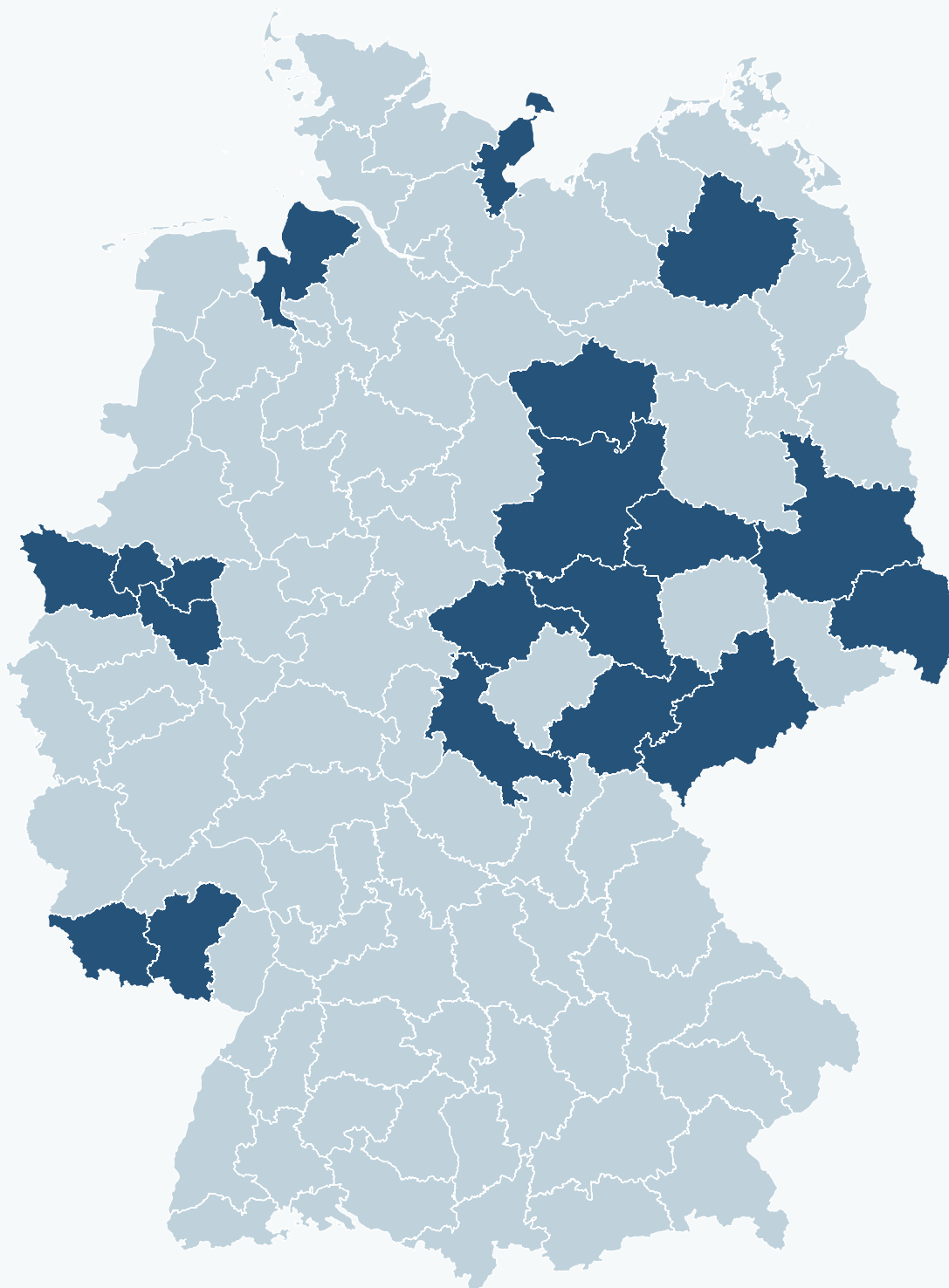
all German regions are rated as vulnerable and by no means are all of them in the Eastern part of Germany. The Ruhr region, more precisely the Emscher/Lippe and Duisburg-Essen districts, do particularly poorly. “Due to their precarious budgetary situation the local authorities are only able to maintain the very basic services by taking out reserve bank loans”, says Südekum.

## Downward spiral

“A large part of the funds available are used for Hartz IV payments (basic security benefits for job seekers), which means that hardly any money is left to pay for repairs in schools, to repair roads, or to maintain recreational facilities.” The downward trend in the region began in the 1990s and today local politicians spend most of their time managing the deficiencies.



# Vulnerable regions in Germany



VULNERABLE

NOT VULNERABLE

SOURCE: IDKÖLN

With low unemployment numbers, high spending power and positive demographic figures Düsseldorf is in good shape. Only the infrastructure shows some shortcomings.



PHOTO ADOBESTOCK.COM - JÜRGEN FÄLCHLE

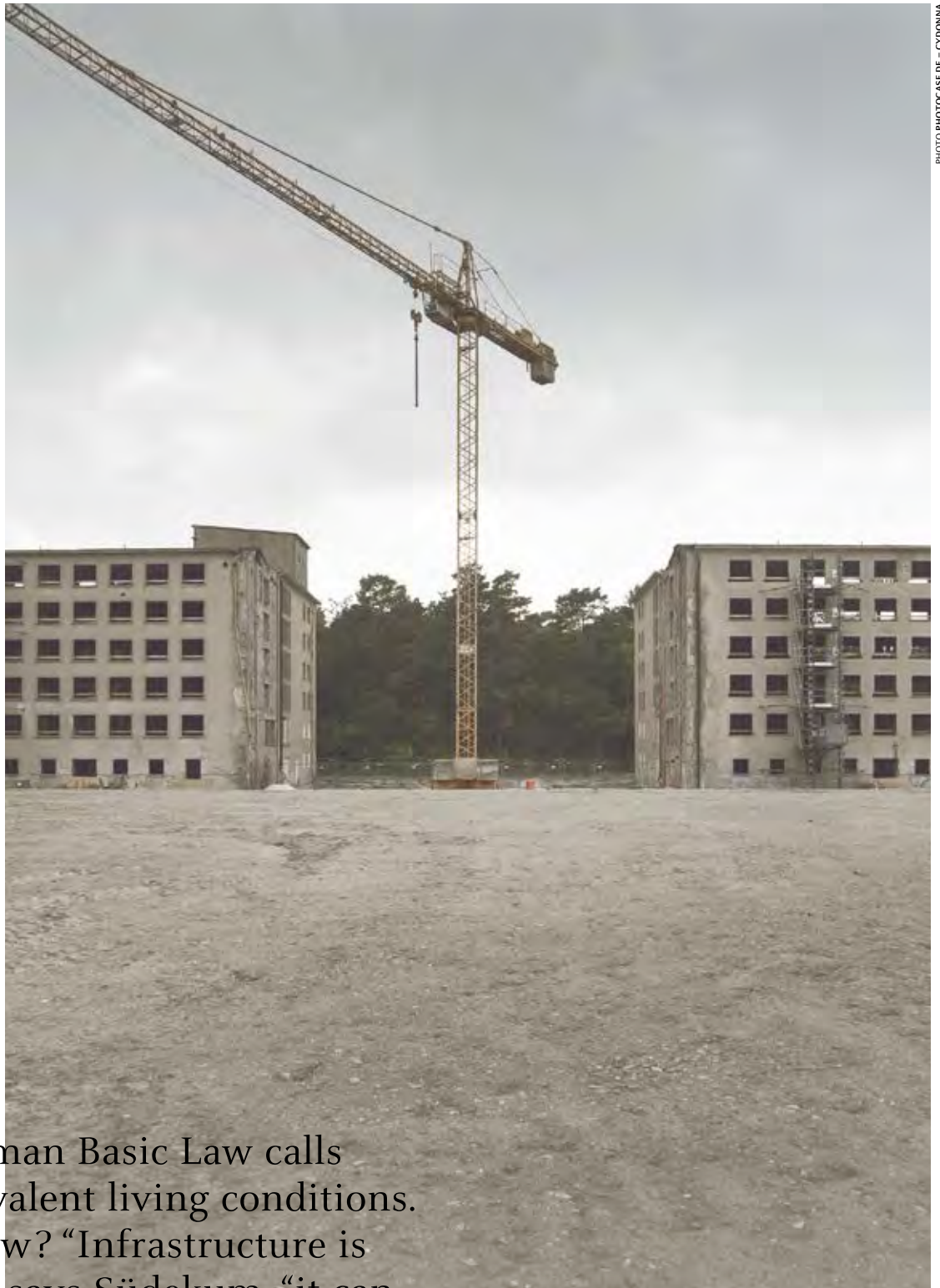


PHOTO PHOTOCASEDE - CYDONNA

The German Basic Law calls for equivalent living conditions. What now? “Infrastructure is the key”, says Südekum, “it can be changed relatively quickly which leads to a recovery of the economy”.



# “Some East German cities lost almost half of their inhabitants at the time which is unprecedented in history.”

— Prof. Dr. Jens Südekum,  
Düsseldorf Institute  
for Competition Economics

The Ruhr region’s example demonstrates that regions that function well in some sectors can still be vulnerable as a whole: public transport is widely available in the region, as is the internet and the demographic figures are better than in almost all of the East German regions. And yet the financial situation is so desperate that without federal support the region will go to the dogs. The crisis has been on the horizon for many years. Other vulnerable German regions can be found in the Saarland, near Bremerhaven and especially in Eastern Germany: the region with the most devastating result was the Altmark region in the North of Saxony-Anhalt.

## The exodus could be stopped

The demographic development is the biggest problem of the five new German Laender. “In the first year after the German reunification they experienced an unprecedented decrease in population“, says Südekum. “Some East German cities lost almost half of their inhabitants, something that had never happened before.” And the regions still suffer from this phenomenon even if the big cities such as Dresden or Leipzig have managed to stop this trend in the meantime. “Since 2014 the exodus from the rural East German areas has come to a halt but the effects will still be felt for a long time.” In 2015, the average age in the Bitterfeld region was 49.1 years, in the Munich area on the other hand it was 42.2 years. The poorer living conditions also have an effect on life expectancy: the inhabitants of the Altmark region on average live to the age of 78.8 years while people in Munich live for 82.2 years on average.

Despite these alarming numbers, the situation in Germany is, compared to that in other countries, still relatively good. According to Südekum this is due to the ‘hidden champions’, the strong medium-sized businesses which can be found all over the country. In the Eastern Westphalia-Lippe region, for example, there are a number of middle-sized businesses that are even world leaders in their respective fields. Not only do they help keep unemployment in the region at an extremely low level, they also support the towns financially with the taxes they pay. This in turn enables the towns to repair and to build roads and to maintain municipal facilities. “These companies have attracted suppliers and subcontractors and are the reason why a number of smaller universities of applied sciences were founded in the area”, says Südekum. “Not only do these universities train the future employees needed by these companies but they are also reason why many young people remain in the region who would



PHOTO PHOTOCASEDE - CL



PHOTO DÜSSELDORF TOURISMUS GMBH – U. OTTE

otherwise have left for the universities in the big cities.” This distribution of economically strong companies all over a country is pretty much unique in the world. The main reason for this is that there were once two separate German states: “After WWII, all of the bigger companies had to leave Berlin: Allianz insurances relocated to Munich, the airport to Frankfurt and Siemens to Erlangen. The companies that before were concentrated in Berlin were now spread all over the country”, explains Südekum. Germany’s federalist structure was another contributing factor to this development.

What do you have to do if you don’t want to accept this disparity, a disparity that also the German Basic Law seeks to prevent by calling for ‘equivalent living conditions’? “Infrastructure is the key”, says Südekum, “it can be changed relatively quickly and then leads to a tangible economic upswing”. This implies not only better roads and traffic infrastructure, better public transport connections from small communities to the surrounding big cities, but also schools, kindergartens

## Fast internet for new business areas?

and local cultural offers as well as the availability of fast internet connections. “5G isn’t primarily aimed at consumers”, clarifies Südekum, “but at the creation of new business fields. Autonomous driving, for example, is a market of the future. But if we don’t establish a 5G standard that is available everywhere across the country, Germany’s economy will get left behind. What’s more, statistically, every euro the state invests leads to private sector investments of 30 cents.

Sometimes it takes only one large investment to trigger an economic boom in a region which then changes the living conditions there. This happened in Warnemünde in the north of Germany, where in 2016 an inves-

tor from Malaysia took over the three local ship yards to build cruise ships. “This created a new small economic boom region pretty much overnight”, reports Südekum. “The availability of infrastructures has improved significantly and thanks to the availability of training opportunities the young people remain in the region and the buoyant tax revenues make it possible to invest in schools, kindergartens and recreational facilities.”

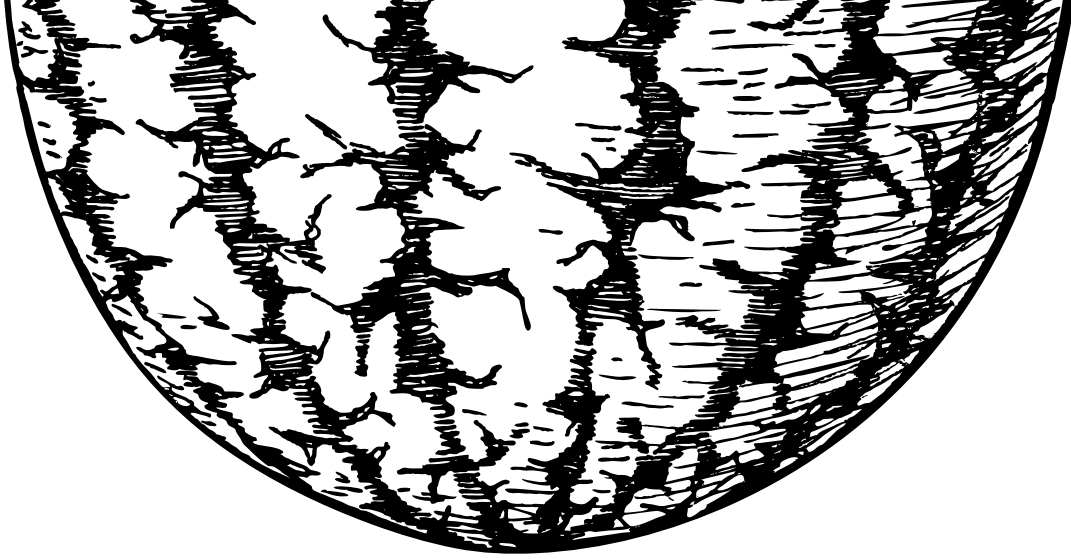
Südekum recommends to bring such investments into the various regions systematically with the focus on medium-sized towns. “If we fear the spreading of populist tendencies in Germany and want to prevent a further splitting of society, we have to act. We have to build excellent infrastructures all over the country especially in the digital, transport and educational sectors. Of course this is no guarantee for provincial prosperity but it significantly increases the chances for geographically coherent economic development with robust and wide-spread economic growth at the same time.”



PHOTO KERSTIN MÜLLER

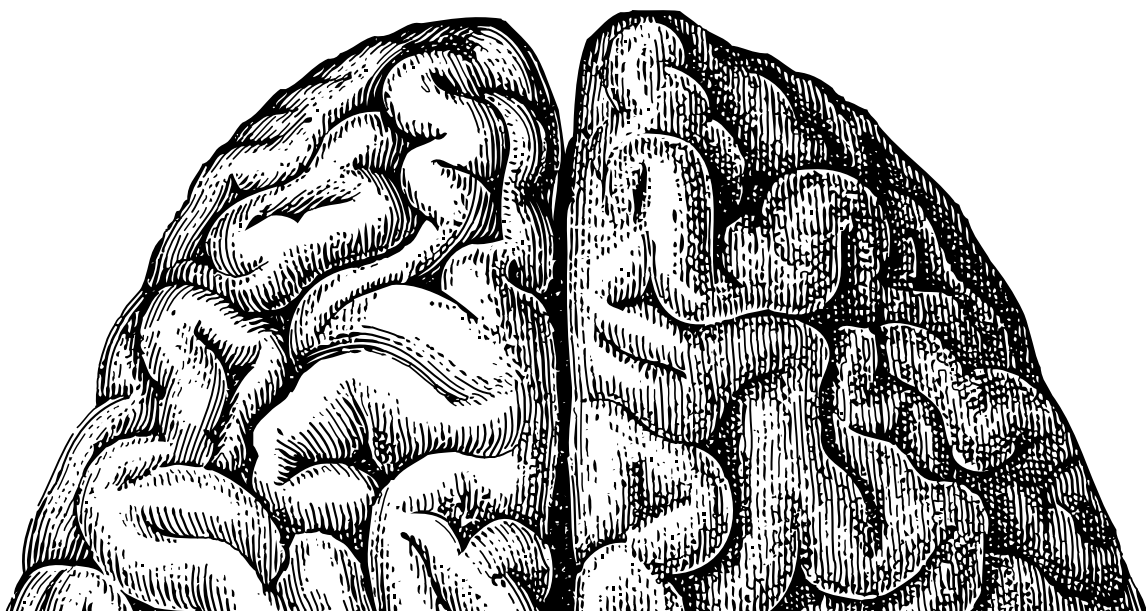
## Prof. Dr. Jens Südekum

The media’s interest in regional politics has risen significantly since 2016. Both Brexit and Donald Trump had their largest voter bases in the ‘left-behind regions’, explains Südekum who has been researching regional economic questions since his doctoral studies. “In this respect I’ve really benefitted from Trump’s success”, says the HHU economist. Meanwhile, he is an advisor to the German Federal Government and the European Commission in various politico-economic questions, and the Frankfurter Allgemeine Zeitung newspaper lists him among the 15 most influential German economists.



# From coconut to cranium

Brain tumour surgery –  
fruit first, real life later





BY VICTORIA MEINSCHÄFER

Brain tumour operations are probably among the most difficult medical procedures – one wrong cut can change a patient’s personality completely. This is why Prof. Dr. Michael Sabel (Clinic for Neurosurgery at UKD, Düsseldorf’s University Hospital) has come up with a charming method that helps students practise this kind of surgery – he helps himself from the fruit bowl.

**M**edical students and junior doctors of UKD’s Neurosurgery Clinic practise brain surgery on coconuts, tomatoes and melons. What sounds funny is to be taken seriously and makes just as much sense as the second step on the way to learning how to operate on the brain: watching video transmissions of operations. This transfer from the operating theatre to an adjacent conference room is offered on a regular basis and isn’t aimed at satisfying a craving for sensation. Instead, it prepares students from as early as the pre-clinical semesters for what’s to come. At the beginning of August, the MAGAZINE was able to attend a fruit surgery and, later, a real brain surgery via video transmission.

Everything starts with a melon: Sabel and his team have carefully placed a small lump of agar-agar inside the fruit. It represents the tumour which is clearly discernible in the CAT scan. A CAT scan enables a 3D view of the skull or, in this case the melon. The position of the tumour is identifiable. It also enables the surgeons to virtually check how best to access the tumour. “All of the brain’s structures are functional”, clarifies the head of the neuro-oncology working group, “we must try to get to the tumour while causing as little

### Surgery during which the patient is fully alert

damage as possible on the way there”. This is why patients are awake during a certain phase in this kind of surgery – for the operating team to be able to continually check the patient’s brain functions by talking to them. As soon as the tumour has been located precisely, the students move on to the coconut. “Its shell is about as hard as a human’s skull”, tells us Dr. Johannes Knipps, research associate at the Clinic for Neurosur-

gery, “so it’s perfect for practising how to position and use the drill correctly”. But before the hole can be drilled the nut, just like the skull later on, must be securely fastened in clamps. The drill that is used has an in-built centrifugal clutch which means that it automatically stops drilling as soon as the hard shell (coconut or skull) has been perforated. Contrary to the human skull, the coconut doesn’t possess another firm membrane underneath the first hard shell, so opening it expertly is almost more difficult than opening a skull. “Once you’ve mastered the art of drilling a hole into the coconut without causing any damage you can do the same with a skull”, compares Sabel. The hole sawn into the skull during the actual surgery can be as big as the palm of a hand. Once the coconut has been opened successfully, the students move on to the tomato. It also contains a little lump of agar-agar saturated with a fluorescent liquid. “In real life we inject the patients with

Once you’ve mastered the art of drilling a hole into a coconut without causing any damage you can do the same with a skull.



PHOTO WILFRIED MEYER



Fruit surgery attracted a lot of spectators at HHU's Science Night.

5- aminolevulinic acid, an active ingredient which attaches itself to tumours and makes them glow blue", Sabel explains this method which was developed in Düsseldorf and that has been in use since 2006 when the team started to dye tumours to make them visible during surgery to be able to better discern them from the surrounding healthy tissue. During surgery, the now glowing tumour

## Millimetre by millimetre

can be made visible under a microscope fitted with blue light. The fluorescent agar-agar lump within the tomato can now be extracted by suction or by milling it out. This looks easy when Dr. Knipps does it, but it actually requires a lot of experience and skill. "This procedure needs a lot of practise – just like children who have to practise how to eat with a knife and fork", explains Sabel, "but in our case every millimetre counts". Millimetre by millimetre the lump within the tomato is milled out and particles of it are extracted by suction until eventually as much of the fluorescent tissue has been removed as possible.

"These are skills that can be practised again and again", says Sabel. "But the most difficult aspect of medical care is the surgeon's decision of when an operation makes sense and when it doesn't." During this decision-making process the neuro-surgeons not only talk to the patients but always to their families as well. This also happened in the case of the 55-year-old pa-

"It is important to find out if the patient's supported by the family prior to the surgery."

— Prof. Dr. Michael Sabel,  
brain surgeon

tient who will undergo surgery in the ZOM II the next day. She is suffering from glioblastoma which has spread over both hemispheres of the brain. Currently she isn't suffering from any symptoms. The tumour was found by pure chance but if it's left untreated she will die within the next few weeks. "Before the surgery it is important to find out how the family is going to react if the result is not as hoped", says Sabel. "In this case I got the impression that the patient lives in a stable family and social environment and that her family will support her in case of complications, for example limited mobility."

This surgery, like many neuro-surgical treatments, will be transmitted via video into the nearby conference room. There is also an audio channel from the operating theatre into the conference room – this means that not only every word that is spoken in the operating theatre can be overheard but also that the audience can ask questions during the procedure. Before the surgery starts at 8.50 am, Sabel talks to the five young doctors and students who are in the conference room today about the patient, her family background and that she is going to talk about cooking recipes during the procedure. "It is necessary for the patient to describe a complex action in full detail, from the planning and preparation stages up to the practical implementation. This patient likes baking, therefore she will describe to us in detail how to bake bread", explains Sabel. "If she starts to stumble we'll know that a part of the brain, in this case the speech area, is affected."

The neurosurgeon is proceeding into the operating theatre. He intends to remove the tumour by opening the skull not only in one, but two places to extract the tumorous tissue. The patient, whose head has been placed in a fixed position, is still sedated. A narrow strip of hair is shaved off her head to get a cosmetically acceptable result, followed by a small cut. Then the scalp is folded to the side so that the cranium can be opened at two points. Just like the coconut on the day before, the skull is opened with a drill. Two little disks of bone,

a little bigger than a 2 euro coin, get cut out of the skull allowing a first look at the meninx. The meninx must be opened, too, so that the operating team can get to the brain proper. Larger blood vessels are either cauterised in the process or simply pushed aside. At 9.30am, Sabel asks the anaesthesiologist to now wake the patient. What he needs now are two hours of excellent cooperation, as discussed with her the day before. The surgeon performs tests on the brain to find out where exactly the speech and movement areas are situated. The surgery is performed directly through the forehead, where the prefrontal cortex is located, the area that controls the ability to perform an adequate reaction in a given situation. Any injury here would rob the patient of the ability to make decisions and make her depressed.

## The patient speaks clearly and distinctly

At 9.40am the patient opens her eyes: she is awake and alert. When asked to she is able to bend her arm, to lift and lower it and count at the same time. A specially trained medical student shows her some pictures: the patient describes in clear and precise words what she is seeing: “This is a bee. This is an aeroplane.” Simultaneously, the brain’s surface is stimulated with electrical impulses to find out which areas of the brain control which movement.

Now Sabel starts to mill out and extract the tumorous tissue. The blue light is switched on and off again and again. A question from the audience in the conference room: “Why do you keep switching off the blue light when you need it to see the tumour?” “I can’t see the blood vessels in blue light”, explains Sabel. And one of the students

in the conference room says quietly: “he is able to tell apart most cerebral gyri anyway. He simply sees more than other people”, she is convinced. While Sabel extracts and mills, the patient tells him how she bakes bread. The medical student meanwhile registers every wrong word, reports every little break or disruption in the patient’s speech.

Well over 90 minutes later, the surgery in which the surgeon was able to remove almost 95 per cent of the tumour – much more than expected – is over. The two pieces of bone which previously had been cut out of the skull are reattached and the scalp sewn back on. Sabel leaves the operating theatre and joins the students in the conference room. He answers questions and talks about what could not be seen in the transmission: “I was able to remove a lot of infiltrated tissue surrounding the actual tumour, so the patient will temporarily experience certain limitations. But soon she will be able to do a lot of things she enjoys.” An MRI will show in more detail how much of the tumour could be removed and if perhaps a second surgery is needed.

The practice lesson with the fruit was fascinating and entertaining. But what brain surgery really means we can, even after watching the video transmission, only begin to imagine at best.



PHOTO PRIVATE

### Michael Sabel

Simulating a tumour with agar-agar and dyeing it (simulated or real) are both methods developed in Düsseldorf. During the surgery the tumour is dyed with 5-ALA to make it glow when exposed to blue light. When the surgery is performed on fruit, the agar-agar is dyed with marker pen colour. The neurosurgeons have also developed a simple headlamp which emits blue light to ensure that surgeons in poorer countries can also perform this procedure. “This enable surgeons in developing countries to see the dyed tumours and remove them as best as possible”, Sabel knows from many visits abroad.

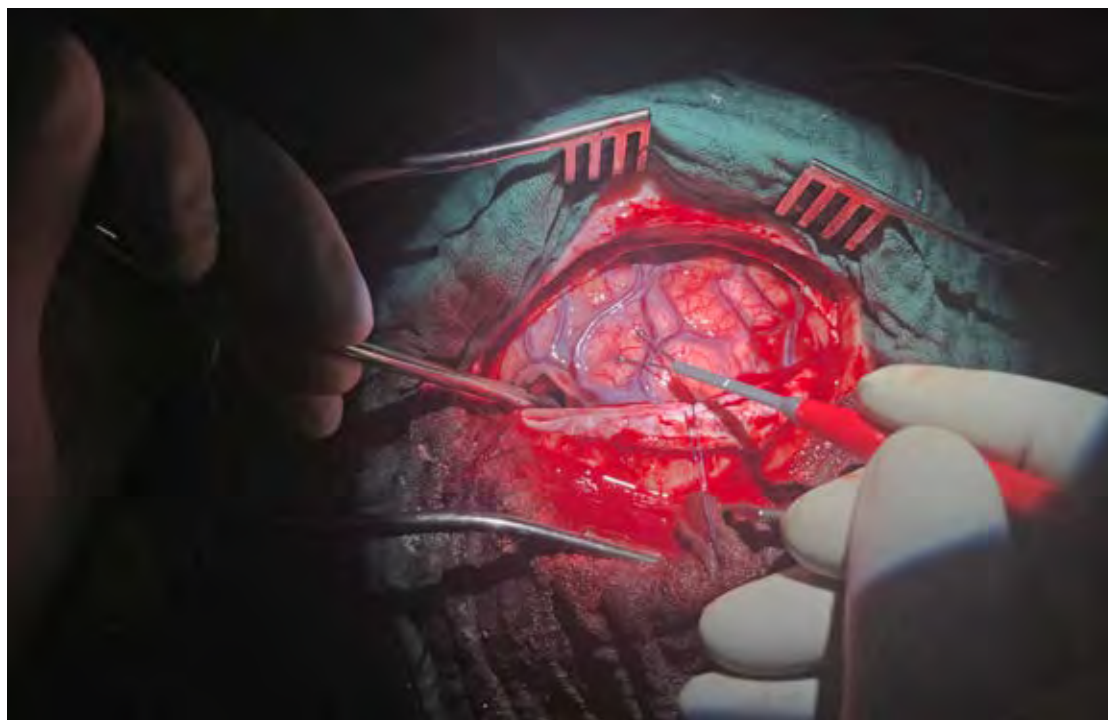


PHOTO UKD/TEAM PROFESSOR SABEL



# Paintings



PHOTO MUSEUM WIESBADEN

# stories

Sophie Schönberger on  
restitution challenges

BY VICTORIA MEINSCHÄFER

Prof. Dr. Sophie Schönberger is convinced: “Paintings are never really without context; they always point beyond themselves, tell a story and create room for association. They are projection screens for very different forms of identity designs”. In her study *Was heilt Kunst? Die späte Rückgabe von NS-Raubkunst als Mittel der Vergangenheitspolitik* (Healing art? The late return of Nazi-looted art as a means of dealing with Germany’s past) she puts it to the point: “Paintings are more and more turning into cyphers for the holocaust as a whole”.

**F**or Schönberger, there’s more to the matter than the purely legal aspects of the restitution of works of art, even though she believes that the German Bundestag should finally pass a law to address this issue. Because after WW2 the Allies passed the necessary laws and the GDR government did the same during the debate surrounding the German re-unification. “It would be a great symbolic act if the Bundestag were to pass such a law because it would once again be a recognition of the injustice done and because it would identify this form of making amends as a conscious decision of a democratic lawmaker”, says Schönberger. And this even though in the opinion of the public morals value higher than the law: “compared to legal measures, morality shines so much brighter and appeals to the higher goals of mankind with its claim to universality and thus seems to serve justice more directly”.

### Returning a painting is a culturally challenging process

Schönberger points out that returning something, contrary to giving it away for free or buying it, is a demanding cultural process because it forces a society to remember instead of letting it forget. This process is embedded in myths of its own which we would like to believe but which are not (or no longer) based on reality. For one thing, it creates the impression that the paintings are returned to their rightful owners. But this isn’t even possible in most of the cases because most

of the former owners are dead. Be it that they were murdered by the Nazis, be it that they have died in the years since then. So, the paintings inevitably go to their heirs. And usually this is not only one person who can or wishes to display them in their living room but instead a community of heirs that often sells or has to sell the painting in order to raise the costs for its recovery. Therefore this is not a re-creation of a seemingly natural state of affairs, nor is it a legal necessity under current German legislation. It is instead a conscious act, a conscious decision to atone for the injustice done, to atone for it even after such a long time because the scale of this injustice was so inconceivable”, says Schönberger.

Contrary to returning factories or money to the rightful owners, returning disappropriated paintings is still widely discussed in German society even more than 70 years after the end of the Nazi regime. One of the reasons for that is that the paintings simply are still around: “You cannot ‘use up’ artworks and they usually don’t get altered either. Their lacking practical value saves them from being worn off by everyday use and from even disappearing by general wear and tear.” But what’s more important – multifaceted narrations are connected to paintings in particular: “Through them, a work of art in many ways turns into a manifest representative of its previous owner who was persecuted by the Nazis.” And as this is very difficult such a long time after the pictures were stolen, the paintings turn into abstract representatives of their former owners instead. “The individuality of a work of art is utilised to attach a personal narrative of the holocaust to the object”, explains Schönberger, “and this why at a certain point the focus



PHOTO MUSEUM WIESBADEN

Hans von Marées, *Die Labung* (Sustenance), 1879/80, was exhibited back to front for seven weeks. Staged to raise donations or cleansing ritual?





Until the funds needed to buy it back had been raised, visitors could only see the back of the painting.



**Healing art?**  
The late return of Nazi-looted art as a means of dealing with the German past.

Sophie Schönberger

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shifts from the human victim to the stolen works of art. They are now seen as objects that have suffered an injustice.”

This attitude can turn into a problem if during the elaborate restitution ceremonies the focus shifts from the dispossessed person and his or her work of art to other things. What happened at the Kustmuseum Wiesbaden is a good example for this according to Schönberger. In 2013, the painting *Die Labung* (Sustenance) by Hans von Marées was identified as being Nazi-confiscated art. The original owner, the Jewish collector Max Silbermann, after his possessions having been looted first, was murdered in a concentration camp by the Nazis. The heirs agreed to sell the painting back to the museum after it had been returned to them. One third of the sum required to purchase the painting was to be collected in a fundraiser. “During the seven weeks it took to raise the money, the painting was exhibited back to front so that the visitors in the museum could only see the back of the canvas. Only after the necessary sum had been raised, the painting was turned over in a public ceremony and its face was revealed to the eye of the public.” For Schönberger this

## Cleansing ritual

was first of all a staging to collect donations but she also draws attention to the ‘cleansing ritual’ behind this: “The impurity of the stolen painting, which is still burdened with guilt, and the shame that is connected to it are symbolised by turning the ‘face’ of the painting towards the wall. Only when it was possible to buy it back could the public look the painting ‘in the face’ again.”

“Paintings tell stories”, says Schönberger and insists we should make use of this fact. Especially in cases of returned paintings that had been confiscated by the Nazis, the narrations which are always connected to paintings should always be added: “they can tell the story of persecution, on an abstract level as well as on an individual level, and therefore explain that returning the painting to its rightful owners is a reaction to this injustice.” But, as Ms. Schönberger points out, those narrations can only partly be achieved with the tools the legal system provides.

“They can tell the story of the persecution, on an abstract level as well as on an individual level and therefore explain that returning the painting to its rightful owners is a reaction to this injustice.”

— Prof. Dr. Sophie Schönberger,  
Lawyer

Project seminar on the  
supply situation during WWI

# Surviving on swede soup, swede butter and swede jam

How did the people in Düsseldorf get through the notorious swede winter of 1916/1917? There was no coffee, cocoa, tea or cotton, even necessary food like potatoes were missing. What kinds of substitutes were available? How did the black market develop? What kind of official and unofficial plans and suggestions did exist to meet the dietary needs of the population during this time of want? Questions to which Prof. Dr. Margit Schulte Beerbühl and her master's degree students hoped to find answers in the project seminar *Der Hungerwinter: Lebensmittelmangel und Unterernährung im Ersten Weltkrieg* (The hunger winter: food shortage and malnutrition during the First World War).







PHOTO ESTATE KÄTHE BUCHLER - MUSEUM FÜR PHOTOGRAPHIE BRAUNSCHWEIG/DEPOSITUM STADTARCHIV BRAUNSCHWEIG

By collecting scrap metal children could earn a few pfennigs.

and more difficult and much asked for goods such as coffee and chocolate were especially difficult to procure. But people didn't really want to do without them, therefore coffee beans were soon to be replaced with chicory and when that was no longer available, coffee was brewed from acorns or other substitutes. Unlike today, chocolate was seen as wholesome, strengthening and nourishing food and was recommended especially to children, old and infirm people as a restorative. Choco-

## No knapsack without chocolate

late could be found in every soldier's knapsack as it can be packed in small packages, is easy to carry and has a long shelf-life. 'No knapsack without chocolate' was a slogan at the beginning of the war. This is why chocolate, alongside cigarettes, was always one of the things to be found in the so-called *Liebesgaben* ('love gifts'), the gift parcels that families send to their soldiers fighting in the war. In Düsseldorf, women founded the charity centre *Zentralstelle für freiwillige Liebesgaben* that distributed sweets and other foodstuff among the soldiers, the infirm and the needy. By 1916 chocolate had disappeared from the free market and the little that was still available was reserved for the troops. Increasingly, acorns were used as a substitute for cocoa beans.

"Before 1914, sugar was available in abundance in Germany", knows the historian. "Due to high technical standards and the availability of fertilizers farmers were able to produce more sugar from sugar beets fields than was needed in Germany." But soon also the

Currently, there is almost no recent local research into this subject", explains the historian. With the help of documents from Düsseldorf's city archives, mostly contemporary publications and diaries, the students tried to find out more about the situation during that time. At the beginning of the war, the German government was convinced that Germany couldn't be starved out. The situation changed dramatically when the British imposed a naval blockade on Germany shortly after the beginning of the war. A misguided German agricultural policy added to the problem. One of the first measures taken was the introduction of the so-called 'K bread' (for *Kriegsbrot* or *Kartoffelbrot* – war or potato bread). It got this name from the fact that potato flour was added. Due to steeply rising prices of pulses and processed foodstuff such as rice or pot barley, potatoes soon were just as important as bread for feeding the population. After the British had imposed the blockade, supplying the population with food became more

## Swede fields turn into potato fields

yields of sugar beet crops, which were predominantly grown in the areas surrounding Aachen and Magdeburg, dropped. For one thing, the work force needed to look after the care-intensive plants was no longer available; the same was true for the fertilizer guano which so far had been imported from South America. All of this led to a drastic decrease in crop yields. In addition to that the *Reichskriegsernährungsamt*, which was in charge of securing the food supply of the German population, gave out the order that fields that

# “Before 1914, sugar was available in abundance in Germany.”

— Prof. Dr. Margrit Schulte Beerbühl,  
Historian

had previously been used to grow sugar beet were from that point on to be used to grow potatoes and corn instead.

Further problems arose at the end of 1914, when the government gave the order to kill all pigs (Schweinemord). “Pigs were seen as rivals for food”, says the historian. The pig, usually living on leftovers and scraps, had suddenly turned into a competitor. Rising prices for animal feed had made it cheaper for the farmers to feed corn or, even more, potatoes to their pigs. Following the government’s order, almost 9 million pigs were slaughtered so that only half of the previously existing livestock remained. There were plans to cull one million dairy cows. In the course of the war the milk supply also turned into a huge problem”, says Schulte Beerbühl. “The animals were starving, so the quality of the milk was poor and the milk was often contaminated during transport.”

The situation continually deteriorated which led to the establishment of the *Reichskriegsernährungsamt* in 1916, a government body responsible for centrally organising the food supply of the German population. Until then, the local authorities had been able to sup-

ply their population with regionally preferred food (“Unlike many other regions in Germany, the people in the Rhineland favour asparagus”). From 1916 onwards food supply was organised in Berlin. This didn’t work particularly well – not unusual in cases of centralisation. Shortly after the beginning of the war, the gov-



PHOTO STADTARCHIV DÜSSELDORF

Because of the blockade, no cotton came into the country: people collected old clothes, repaired und re-used them.



The supply situation was problematic all over Germany. Around 1915, the waste treatment corporation A.V.G. in Braunschweig organised a competition. The best rubbish collectors won a prize: they received a rabbit each.

ernment had already decreed maximum prices for food which led to goods disappearing from the shops only to resurface at even higher prices on the black market.

As early as in the beginning of 1915, the suffering of the starving population forced many municipal administrations into organising livestock breeding and agricultural farming single-handedly. They encouraged people to develop ideas which allowed them to help themselves. In February 1915, Düsseldorf's Lord Mayor appealed to the public to convert all unused building plots and unused areas into cultivated land so that potatoes and vegetable could be grown. Every avail-

## Potato blight destroys the harvest

able open space was used to grow vegetables. City dwellers turned into 'farmers', they grew their own vegetables and kept pigs at home. Those self-help activities in the cities were often mocked as 'window sill plantations'. Being 'self-sustaining farmers', the people in the cities enjoyed a few exceptions from the otherwise harsh restrictions that the controlled economy normally brought along. With meat being scarce, they took to buying pigs in the countryside where the pigs stayed as 'boarders'. These 'boarding pigs' – also called 'balcony, cellar or salon pigs' – were then brought into the city and kept in their homes or flats a few weeks before they were due to be slaughtered.

From July 1916 on, the supply situation worsened again and reached its lowest point in 1916/17. The potato blight destroyed large parts of the harvest and caused the notorious swede winter of 1916/17. There were times when the cities didn't receive any potato allocations. During the first quarter of 1917, Adele Statz reported repeatedly that for weeks potatoes were unavailable and that the swedes started to rot. "At that time, people had almost run out of



Never without chocolate: The chocolate manufacturer Stollwerk was an army supplier during WW I.



“The British blockade wasn’t lifted until 1919. Shortly after they did, the French occupied the Rhineland which brought along new food supply disruptions.”

— Prof. Dr. Margrit Schulte Beerbühl,  
Historian

fats and sugar so they tried to get sufficient calories to sustain themselves out of swede jam, swede soup, swede butter, swede schnitzel and the like. But swede were fodder beets, not sugar beets – apparently they tasted awful,” says Schulte Beerbühl. “According to the documents we found in the city’s archives, the ration allocated to the people in Düsseldorf sank from 1500 to 1100 calories a day in early 1917,” reports the historian. Not only food was scarce but also lots of other goods such as coals, so that many people were freezing in their homes. Since 1917, even clothes could only be obtained via coupons which led to strikes and hunger riots in Düsseldorf in June 1917. Contemporaries such as Adalbert Oehler, then Düsseldorf’s Mayor, tell us about heavy riots and lootings of grocery stores, even in Schadowstraße.

## Tuberculosis and infectious diseases

As early as 1916, people began to suffer from deficiency symptoms and other health problems. The number of tuberculosis sufferers was rising, as was the number of people suffering from infectious diseases. The figures we have regarding the casualties during this famine must be treated with caution. It is estimated that



Cocoa made of acorns, swede jam and ersatz coffee replaced the food-stuffs that were not available.

alone during the winter of 1917 about 260,000 civilians died of hunger or the flu. Other sources estimate that during the four years of war about 700,000 civilians died of hunger, malnutrition or infectious diseases. Child mortality is rumoured to have risen by 50 per cent. Women’s mortality rate is said to have risen by 7.3 per cent per 1,000 deaths by 1918 as compared to 1913, the last year before the war. In the same period of time this number only rose by 2.4 per cent in England.

After the end of the war the situation for the population only gradually ameliorated. “The British didn’t lift the blockade until 1919 and shortly after they did, the French occupied the Rhineland which brought along new food supply disruptions”, says Schulte Beerbühl. The situation only got noticeably better after the currency reform and after the French troops had withdrawn from the area.



# University House

University House was placed at the disposal of Heinrich Heine University by the van Meeteren Foundation. Its purpose is to provide information and advice as well as foster an exchange between science, culture and education. In the framework of a large spectrum of events, the University offers local citizens the possibility to experience cutting-edge research and research findings and shares university life with the city.

## Further information, programme, bookings:

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