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Abbreviations:
acatech: acatech – National Academy of Science and Engineering
ML: Member of the Leopoldina
Union of German Academies: The Union of the German Academies of Sciences and Humanities

Discussions with politics and society



Jörg Hacker, XXVI. President of the Leopoldina, in front of the headquarters in Halle (Saale)

Photo: Karsten Möbius

Renewable energies, artificial intelligence, genome editing: these buzzwords stand for scientific discoveries and technological innovations which are already fundamentally changing our society. But what form should this change take? Quick and comprehensive access to the latest research is essential for informed discussion and responsible decision-making on this issue. We thus rightly expect the scientific community not just to develop new knowledge but also to create reliable channels for exchange with politicians and the public.

Since being named German National Academy of Sciences ten years ago, the Leopoldina has evolved into a hub for dialogue between the scientific community and society as a whole. This special edition of our newsletter will give you an insight into the diverse range of topics that the Leopoldina has dedicated itself to and will continue to work on, at a national and an international level, in close collaboration with other academies and scientific institutions – topics with a strong scientific grounding and far-reaching consequences for society as a whole. I would like to extend my heartfelt thanks to all of the scientists whose voluntary work makes our activities possible, as well as the partners and sponsors who support our dialogue with society.

These words of thanks come with a request, in view of the fact that socially relevant progress in basic and applied research is increasingly the result of interaction between different disciplines

and areas of technology. Let me give you an example from the area where digitalisation and life sciences overlap: genome editing enables us to efficiently modify the genetic information of living organisms. This opens up entirely new areas of application in medicine, but it is impossible without computer programs which intelligently analyse complex data volumes. This makes informatics a critical driver of progress in life sciences.

We must recognise promising synergies like this at an early stage if we want to support the public and politicians in evaluating the impact they may have on

our lives and the world of work. This calls for scientists who are able to think outside the box – to look beyond the individual disciplines in which they have excelled as researchers. The success of the Leopoldina will depend on their commitment more than ever in the future.

This is why, dear readers, I would like you to ask you to join us as we venture off the beaten path in search of new channels for dialogue between science and society as a whole, so that we can gain insights into future developments in research and their potential applications as early as possible. This is the only way in which the Leopoldina can demonstrate its importance as a hub for the closely interconnected scientific society of the 21st century.

Jörg Hacker



Photo: Bundesregierung/Steffen Kugler

President of the Federal Republic of Germany Frank-Walter Steinmeier on 10 Years National Academy

“Reason and enlightenment are more important than ever in the search for answers to the great questions of the present and the future. We must turn to experts in the fields of science and research for this. For over ten years, the Leopoldina – the German National Academy of Sciences – has been providing the political and social realms with expert advice on numerous issues that are of great importance for the future. I would like to express my deepest gratitude to the Leopoldina members, as well as to all those who have supported the Leopoldina in this demanding work.”

“I was completely taken by surprise”

Volker ter Meulen remembers the day when the Leopoldina was named National Academy.

It was the radio that first spread the news on 16 November 2007: the Leopoldina was to be named German National Academy of Sciences. Prof. Dr. Volker ter Meulen ML, then President of the German Academy of Natural Scientists Leopoldina, heard the news whilst travelling in Rajasthan, India. “I was completely taken by surprise – and of course I was overjoyed,” he remembers today, ten years on.

In 2007, most people were astonished by the news. The general expectation had been that a new National Academy would be founded.

Yes, the Science Council had made the case for a new National Academy in 2004, arguing that the existing academies were not structurally equipped to take on the tasks of a National Academy.

No one questioned the necessity of having a National Academy?

Quite the contrary: this was stressed again and again – including by politicians. Soon after the Wall came down, former Chancellor Helmut Schmidt mentioned the need for a National Academy for the first time, and Chancellor Helmut Kohl reiterated it in his government declaration of 1994. Scientific institutions too wanted a National Academy to effectively represent German scientific interests in international bodies.

The torturous debate was ended decisively by the Minister for Education and Research. Why did she choose the Leopoldina?

The G8 summit at Heiligendamm in 2007 may have had something to do with it. In the run-up to the summit, the Leopoldina invited the Presidents of the Academies of the G8 nations and five additional countries to a meeting in Halle, where they prepared joint, science-based statements on some of the topics that were on the



The then Federal Minister of Education and Research Annette Schavan presents Volker ter Meulen, then President of the Leopoldina, with the certificate naming the German Academy of Natural Scientists Leopoldina as German National Academy of Sciences on 14 July 2008. Photo: Jens Schlüter

agenda. This proved that the Leopoldina was capable of providing this kind of policy advice.

What kind of resistance did you have to overcome? And who, or what, helped you overcome it?

Our strongest supporter was Annette Schavan, then Federal Minister of Education and Research. She promoted her idea with great skill. Some federal states were initially opposed to the Leopoldina being appointed. But just three months later, in February 2008, the Bund-Länder Commission for Educational Planning and Research Promotion unanimously approved the decision. Horst Köhler, then Federal President of Germany, also lent the Leopoldina crucial support. Everything came together to create a historic opportunity, which was seized by the political decision-makers. The fact that, even then, around 30 percent of our members were from non-German-speaking countries also worked in our favour. In 2010, the

European Academies' Science Advisory Council (EASAC) was relocated to Halle, which could be interpreted as a vote of confidence from the National Academies of the EU Member States.

Where does the Leopoldina stand today?

The Leopoldina has thrived over the last ten years. Today, it is an active academy and scholarly society of national and international importance. It is represented in a host of international bodies of academies and is actively involved in preparing scientific documents for German and global political bodies. Our collaboration with the Union of the German Academies of Sciences and Humanities and with acatech has been very fruitful, producing a series of joint statements.

What awareness does the public have of your work?

Take, for example, our statement on preimplantation genetic diagnosis in 2011. Leading politicians confirmed that it was included in the parliamentary debate. Another example is the position paper on the energy transition which was commissioned in the aftermath of the Fukushima nuclear disaster in the spring of 2011, and which we managed to produce in just six weeks. Many more documents followed, most recently a paper on plant protection and one on traumatised refugees.

What remains to be done?

There are some areas where we could do with more international exposure. There are some excellent bilateral collaboration programmes with other academies and networks of academies. Our truly outstanding publications could attract more attention if we published them in English and actively distributed them throughout Europe and beyond.

INTERVIEW BY LILO BERG

Science needs backing

Martin Lohse, Vice President of the Leopoldina, talks about scientific policy in Germany.

Actively shaping scientific policy is one of the Leopoldina's tasks. Prof. Dr. Martin Lohse ML, Vice President of the Leopoldina and Scientific Director of the Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC) in Berlin, explains how the Academy drives policy and how the German scientific system can remain sustainable.

What does the Leopoldina see when it looks at the German scientific landscape from a bird's eye view?

It sees a system which has a few strong pillars and the universities at its centre. We are in favour of further consolidating their central role.

There have been a number of plagiarism scandals at German universities ...

Unfortunately, yes. We submitted a joint statement with the academies of the federal states in 2017, which stressed that the university as a whole should be responsible for doctoral theses. Most of the time, only the doctoral candidate is held accountable when something goes wrong, and occasionally their tutor – this is unacceptable. We recommend setting up thesis committees to evaluate all theses. New graduate schools or similar institutions which provide better supervision for doctoral theses would also be a step in the right direction.

Allow us to take a glimpse behind the scenes: what new developments are on the horizon?

We are currently working on a discussion paper on the selection and assessment of scientists, for example. We want to move away from the current fixation with quantitative criteria, the primacy of citation frequency, journal impact factor and outside funding. Based on these criteria, Beethoven would have been deemed a failure: he wrote just nine symphonies, while other composers wrote a hundred – and he may have chosen the wrong publisher for his small body of work. We have to face the music, and that goes for the sciences too.

You mentioned that the Leopoldina has a particular feel for the topics of the future. So what is the next big thing?

There are several. One is quantum technology, which has immense potential for communication and information technologies. Our 2015 statement was instrumental in the European Commission's decision to launch a multibillion-euro flagship project in this new research area.

And what about legislation? What effect does the Leopoldina have there?

Let's take animal experiments as an example. An EU Directive on the subject from 2010 had to be incorporated into German law. This is a laborious process, and we were actively involved in it. Animal welfare is extremely important. But freedom of research is even more important to us, as are the benefits that medical research creates for our health. We're constantly finding new arguments to defend this position.

How efficient is the Leopoldina as a whole?

That depends on how well we communicate and how receptive politicians and society are to what we have to say. In Germany, our influence is undisputed. But this can change quickly, as the situation in the USA shows. The National Academy's

voice carried great weight there for decades. This has completely changed under the new administration.

Can the Leopoldina learn from this?

Certainly! We shouldn't just communicate with scientists and politicians. We should also engage more actively with society as a whole, because we need a broad support base. We have to try harder than ever to reach the entire population. We absolutely don't want to see a disconnect emerge here on the same scale as in the USA.

How do you think you can prevent that from happening?

This is a question that we think about a lot. I believe that we have to explain more clearly how we arrive at our findings, what makes them valuable, how scientific findings can be distinguished from “fake news” and what significance they have for society. We have to hit the right note, without coming across as superior or even elitist.

What role does journalism play here?

We would like journalism to be strong, to critically appraise our work. How can we preserve this essential element of democracy? That's another question that we're giving a lot of thought.

INTERVIEW BY LILO BERG



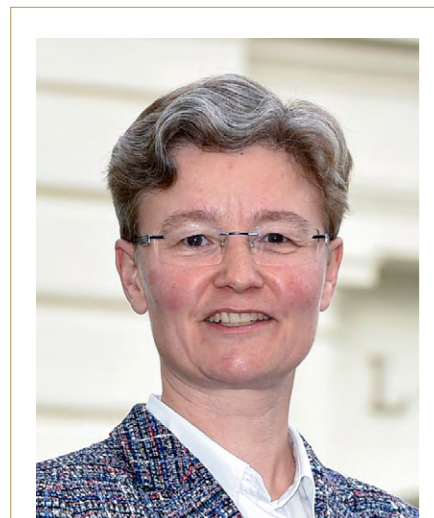
Martin Lohse, a pharmacologist, has been Vice President of the Leopoldina since 2009.

Photo: Christof Rieken

Open-mindedness and science diplomacy

In its role as National Academy, the Leopoldina represents German science on the world stage. Strategic partnerships form the basis for international policy advice.

Halle, March 2017: At the Leopoldina's invitation, the science academies of the G20 nations meet to discuss improvements in global health care. Dr. Angela Merkel joins the discussion round. At the end of the symposium, four months prior



The economist Regina T. Riphahn has been Vice President of the Leopoldina since 2017 and is responsible for international relations.

Photo: Thomas Meinicke

to the G20 summit in Hamburg, the joint recommendations are presented to the German Chancellor. This is the first time that the views of the scientific community have been presented in plenty of time before a summit and can be part of the discussions right from the start. The idea for this came from the Leopoldina, and was warmly welcomed by politicians. In the future, these Science20 Dialogue Forums will be held prior to every G20 summit, led in each case by the host country's academy of sciences.

Within just a few years, the Leopoldina has become an internationally influential voice for the German scientific community. The Leopoldina's views are respected when it comes to international policy advice, and the Academy collaborates with global institutions such as the United Nations and the World Health Organisation. It maintains friendly relationships with academies of sciences on every continent, and is active in international associations of academies. This open,

cosmopolitan approach is virtually part of the Leopoldina's DNA. More than 30 nations are represented in the Leopoldina, and a good quarter of its members are from outside Germany. It works particularly closely with a number of academies as part of bilateral strategic partnerships. "We limit ourselves to a small number of carefully selected partnerships, which we can then invest all the more energy into," says Prof. Regina T. Riphahn, PhD ML, an economist and member of the Leopoldina Presidium responsible for international relations. The Leopoldina's collaboration with France shows just how successful this strategy is. The 2012 cooperation agreement with the Académie des sciences quickly produced a high-profile statement on the energy transition in both countries. "We are soon going to start work on a joint position paper on artificial intelligence," announces Riphahn.

The Leopoldina maintains six strategic partnerships with National Academies around the world, covering a wide range of topics and involving regular conferences in the countries involved. Its cooperation with Israel started out with a focus on neurosciences, and is now primarily concerned with digitalisation. The partnership with the Indian Academy centres on nanoscience and cognition; with South Korea, on stem cell research and artificial intelligence; with China, on the importance of basic research as well as on personalised medicine. And the Leopoldina's work with the South African Academy focuses on environmental sciences and mental health.

These close scientific ties can have huge political importance, as shown by the strategic partnership with Russia, which was initiated in 2011. This helps promote young scientists and should be expanded further, says Riphahn. She believes that "science has an obligation to build bridges between nations and help mediate in conflicts".

The German Chancellor and the Federal Foreign Office both believe in the value of science diplomacy and rely on the Leopoldina's expertise. This was demonstrated during the Western Balkans Process, an initiative aiming to bring the

region closer to the European Union with a view to future membership. In 2015, at the German government's request, the Leopoldina took the helm in the field of culture and science. Despite political stagnation, a pioneering spirit can still be felt in the scientific community, says Riphahn: "We're talking about setting up student exchange programmes, joint research projects and a dedicated funding body modelled on the German Research



Photo: Bundesregierung/Steffen Kugler

Chancellor of the Federal Republic of Germany Dr. Angela Merkel on 10 Years National Academy

"The German National Academy of Sciences is the heart and the voice of German science. The Leopoldina embraces its role as a mediator of scientific knowledge with a remarkable level of diligence. As a result, it is held in the highest regard, both nationally and internationally. I would like to now express my sincere thanks for the great job it has done over the last ten years. I look forward to hearing from the Leopoldina in its capacity as a driving force in the shaping of future public opinion and wish it continued success in its collaborative work that continues to strengthen Germany's position as a centre of scientific enterprise."

Foundation (DFG), for example." While all of this is going on, preparations for the next summit are also in full swing. At the G20 summit on food security, to be held in Argentina at the end of the year, the Leopoldina will once again be joining the Science20 Forum. Riphahn is looking forward to the meeting. "The fact that the global scientific community continues to speak with one voice, and that this voice is heard, is very positive."

BY LILO BERG

■ FOR MORE INFORMATION PLEASE CONTACT THE HEAD OF THE INTERNATIONAL RELATIONS DEPARTMENT, DR. MARINA KOCH-KRUMREI.

Solutions to the challenges facing society

The Leopoldina provides science-based policy advice that helps shape social policy.

There are plenty of organisations offering policy advice in the German capital of Berlin. But only very few organisations can claim to develop evidence-based solutions for societal challenges that take into account the latest scientific findings. The Leopoldina is one of them.

This is what Germany's National Academy contributes to society and in particular to members of the German parliament, to the Federal Ministries, to international and also regional politics.

consults on these proposals, for example to establish whether a topic has sufficient societal, political and scientific relevance, and finally takes a vote. If the proposal passes the vote, a Working Group can be set up. National and international scientists are recruited for these Working Groups on the sole basis of their expertise in the relevant discipline. "This ensures that every Working Group meets the exceptionally high scientific standards that we need," explains Bonas. The interdisciplinary Working Group is then tasked with preparing statements on topical issues.

The Leopoldina's statements, most of which are prepared in collaboration with the academies mentioned and other partners, aim not just to present sound scientific findings but also to be translated into policy. This often works. In 2011, the statement on the consequences of the Fukushima nuclear disaster for energy and research policy fed into the recommendations of the Ethics Commission on a Safe Energy Supply which was set up by the German Chancellor.

In 2015, the Leopoldina's statement "Green genetic engineering" managed to give new direction to the debate on this controversial topic. When it came to the implementation of the Animal Welfare Directive from EU into German law, the Leopoldina delivered a statement which was decisive in shaping the new national legislation.

This year, the statement "Traumatised refugees – immediate response required" attracted a great deal of attention, and the Leopoldina has also been helping to shape the ongoing public health debate with its 2015 statement "Public health in Germany" and presentations at the G7 and G20 summits. The statement on preimplantation genetic diagnosis (PGD) which it published in 2011 was also met with significant public interest.

However, this interdisciplinary approach does not always run smoothly. The Leopoldina's work on PGD saw a clash between reproductive experts, ethicists and philosophers, with each camp bringing their own academic culture and scientific language to the debate. But the laborious process of finding a consensus

to present to the public turned out to be worthwhile. "The statement attracted a great deal of interest not just from members of the German parliament, but also from the media and wider society," explains Bonas.

Waiting for politicians to address the topics recommended by the Leopoldina often takes patience. "Politics follows its own particular rules," says Bonas. Sometimes, a topic that the scientific commu-



Plant geneticist Ulla Bonas has been Vice President of the Leopoldina since 2015 and is in charge of the Science – Policy – Society Department.

Photo: Christof Rieken

nity considers urgent does not yet play a significant role in politics at that time. But it appeared that politicians will gladly take up the Leopoldina's existing recommendations at a later date. The approach of the Report on Tomorrow's Science on Omics technologies in life sciences, which was published in 2014, was taken up several years later in funding programmes with reference to the Leopoldina.

BY BENJAMIN HAERDLÉ

■ FOR MORE INFORMATION PLEASE CONTACT THE HEAD OF THE DEPARTMENT SCIENCE – POLICY – SOCIETY, ELMAR KÖNIG.

Enabling a long and healthy life

Public health issues range from antibiotics research to palliative medicine.

Public health covers a wide range of topics, including cardiovascular disease, non-smoker protection, human immunodeficiency virus (HIV) and infectious diseases. As such, it affects all areas of the health, education and welfare systems, as well as the economy.

The multidimensional nature of this issue encouraged the Leopoldina, acatech and the Union of German Academies to publish a statement on it in 2015. "Public health is a typical interdisciplinary and transdisciplinary topic which is also ideal for the Leopoldina because we are able to bring together more knowledge more quickly than any other institution," says Prof. Dr. Lothar Heinz Wieler ML, President of the Robert Koch Institute (RKI).

Healthy at birth

According to Wieler, this is a matter of urgency because public health is one of the most important tools for improving



Hans-Peter Zenner

"Access to palliative care is not equal or fair – particularly in rural areas, the situation is difficult."

Photo: David Ausserhofer

the health of the population. "Many health challenges can only be solved if we look beyond the development of therapies, hospital care or out-patient care and work just as hard on the issue of health across all areas of politics," Wieler explains.

Public health also covers controversi-



Access to medical care is one of the foundations of public health.

Photo: sebra – stock.adobe.com

al ethical issues. In 2010, together with the Berlin-Brandenburg Academy of Sciences and Humanities and acatech, the Leopoldina prepared a statement on the possibilities and limitations of predictive genetic diagnosis in healthy people. One year later, the Academies presented a statement on Preimplantation genetic diagnosis (PGD), a procedure that enables parents who carry a high risk of having a child with a severe hereditary disease, or a miscarriage or stillbirth for genetic reasons, to have a healthy child.

The experts spoke in favour of permitting the carefully controlled use of PGD under certain circumstances. At that time, the debate in Germany was very emotional, and the scientists' contribution helped a much more rational approach to emerge.

Dignity at the end of life

Palliative care is also part of public health, and it has received increasing public attention as part of the growing discussion about dying with dignity. The objective of palliative care is to give patients with a life-threatening or incurable disease, as well as their families, the best possible quality of life. But the statement "Palliative care in Germany", published by the Leopoldina and the Union of German Academies in 2015, showed that Germany's performance in this area is only average. "Countries such as the US, the UK and Sweden have much more

advanced palliative care," says Prof. Dr. Hans-Peter Zenner ML, speaker of the Working Group. There are considerable differences within Germany, too. "Access to palliative care is not equal or fair – particularly in rural areas, the situation is difficult," explains the physician.

The Leopoldina therefore advocated introducing rules for universal care and quality assurance standards in Germany,



Lothar H. Wieler

"Public health is a typical interdisciplinary and transdisciplinary topic which is ideal for the Leopoldina."

Photo: Andrea Schnartendorff/RKI

among other measures. Resistance to antibiotics is seen as a major public health challenge around the world. According to

the World Health Organisation (WHO), it is one of the biggest threats to human health.

Fighting infectious disease

In 2013, the Leopoldina and the Academy of Sciences in Hamburg published the statement "Antibiotic Research: Problems and Perspectives", which suggested ways to tackle the problem of resistance and the lack of new antibiotics. Possible measures include new classes of anti-



Katja Becker

"We still know far too little about how infectious diseases interact with each other and with other, non-infectious diseases."

Photo: Franz Möller

biotics, vaccines and diagnostics for infectious diseases, as well as the development of new approaches to preventative care. "We managed to increase awareness, but that doesn't mean the problem has been solved," says Wieler. What we need, he explains, is to change the way we use antibiotics. And he believes that a great deal of research into the mechanisms of antibiotics and bacterial infections is still needed.

Prof. Dr. Katja Becker ML of the Justus Liebig University Giessen is an expert researcher in the field of infectious diseases. She specialises in tropical diseases such as malaria, bilharziosis and dengue fever. "Neglected Tropical Diseases are still an issue, as the Ebola outbreak in the Congo this year showed," she says. These diseases seem very far away to many Europeans, but that is a misconception: "Globalisation is bringing everyone

closer together, and many diseases are spreading northwards via travellers or because of climate change," Becker explains, mentioning African swine flu and severe acute respiratory syndrome (SARS) as examples. "We still know far too little about how infectious diseases interact with each other and with other, non-infectious diseases," Becker says. She argues that science and industry have to coordinate their efforts much more closely, for example in the field of drug discovery.

The Leopoldina's assessments of infectious diseases have also reached the international stage. The national academies of sciences of the G20 states presented recommendations for global health care, prepared under the Leopoldina's leadership, at the G20 Summit of Heads of State and Government in March 2017. At the G7 summit two years previously, the academies had presented statements on infectious diseases, antimicrobial resistance and neglected tropical diseases.

Prof. Dr. Heyo K. Kroemer ML confirms that there have been some positive developments in particular in the area of infectious diseases. "But public health is a very wide-ranging topic, and for many citizens, securing the future of our health care system is a vital element of public service," says the Speaker of the Board of Göttingen University Hospital. He explains that, even though the German health care system has a good international reputation, "the German system of solidarity will be threatened if demographic change leads to fewer and fewer people financing the health care system or being available to staff it in the near future," says Kroemer.

Customised medicine

One future health care strategy could be individualised medicine, which means using new types of therapy customised for each patient, systematic diagnostics and innovative procedures to provide more effective treatment. At the end of 2014, the Leopoldina, acatech and the Union of German Academies published the statement "Individualised Medicine". "Our aim with this statement is to discuss the fundamentals of how politics, science and society should deal with the rapidly growing field of individualised or personalised medicine," says Kroemer, who was one of the three speakers of the Working

Group. Who is going to pay for the expensive treatments? What treatments will be reimbursed? Who decides whether or not



Heyo K. Kroemer

"For many citizens, securing the future of our health care system is a vital element of public service."

Photo: Markus Scholz

certain diagnostic procedures are used? None of these questions have yet been answered.

In their statement "Public Health in Germany", the academies described the need for action in other areas of public health, too. Above all, Kroemer wants to see new scientific structures that can help strengthen public health in Germany. The first step towards this has already been taken. This year, the German Research Foundation started funding groups of researchers who will be working on public health issues for up to six years. This is the first time that Germany's most important research funding body has provided seven-figure sums for basic research in this field.

BY BENJAMIN HAERDLER

Pressing need for public discussion

Genome research raises many questions and is an important issue for policy advice.

Advances in genome research, in particular the new methods of “genome editing”, confront us with existential questions and are a crucial issue for the Leopoldina. Reports about the possibility of preventing hereditary diseases at conception, or even genetically “designing” children according to their parents’ wishes, are shifting the boundaries of what is conceivable. Four different views of developments in human genome research show what possibilities exist and what questions these raise for society as a whole.

“The progress in this area is unbelievable!” Prof. Dr. Bärbel Friedrich ML was a Vice President of the Leopoldina and used to investigate the genomes of microorganisms. “We worked on the smallest imaginable scale back then. It sometimes took years to make a targeted change to one gene. Today, machines can do this

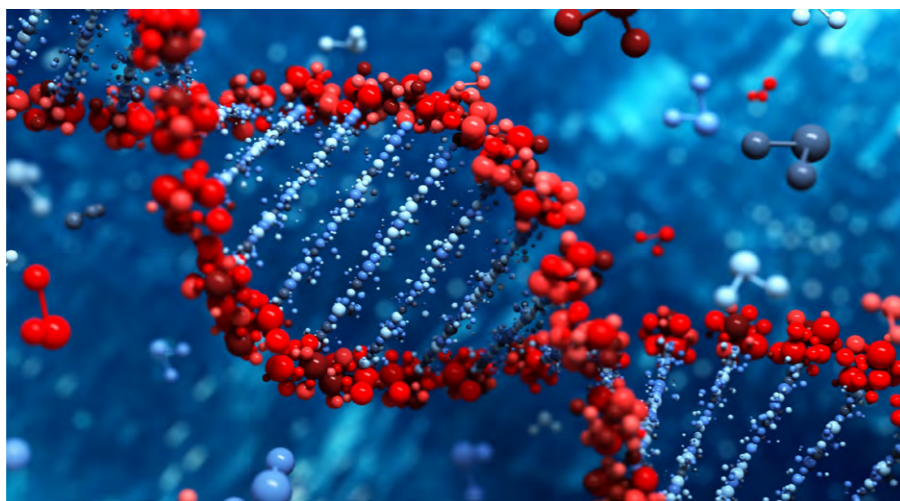


Jörg Vogel

“Science enables us to live a healthier, longer life. This is something that I, as a scientist, can give back to society.”

Photo: Christof Rieken

in the space of a few hours.” This rapid technological progress has changed the nature of research. Science and society are constantly faced with the question of what research can – and should – be carried out on humans. The Leopoldina’s statements on these issues, such as the paper published in 2015 with acatech, the Union of German Academies and the German Research Foundation, “The opportu-



Genome editing enables targeted changes to the genetic makeup of a living organism.

Photo: ssilver – Fotolia

nities and limits of genome editing” ask these questions, trigger debates and outline possible responses.

Predictive genetic diagnostics (PGD) allows doctors to predict people’s health far into the future. The human genome was fully sequenced in 2003, and the news was a source of great hope. We were told that soon we would be able to cure Alzheimer’s, Parkinson’s and cancer before they even appeared. “Unfortunately, this has raised some false hopes,” says Prof. Dr. Klaus Tanner ML. The theologian and ethicist raises the question of researchers’ responsibilities and patients’ rights. “This leads to expectations that cannot be met and creates uncertainty for patients.” No revolutionary cure has materialised.

The genome has been deciphered

However, genome sequencing has opened up new possibilities in diagnostics. Scientists have been able to identify biomarkers for certain types of cancer. This allows them to tell whether or not chemotherapy is successful for a particular patient. “This kind of personalised medicine spares patients unnecessary suffering,” says Friedrich. But sequencing also raises new questions. Huntington’s disease, for example, is a hereditary disease which is currently incurable and which generally appears in adults, but can now be diagnosed in infancy. Should doctors be doing

this? These are the types of questions that the Leopoldina, acatech and the Union of German Academies discussed in their statement “Predictive genetic diagnostics” in 2010.

Debating embryo protection

“Genetic engineering has led to the idea of the ‘right not to know’,” explains Prof. Dr. Jochen Taupitz ML, who is an



Klaus Tanner

“We also have to address misconceptions. Among the general public, there’s this deeply rooted idea that genes are like building blocks. But a cell is not a set of Lego bricks!”

Photo: Markus Scholz

expert in medical law. “But what about a disease that could be cured? Shouldn’t doctors have to tell the patient?”

Huge strides have also been made in reproductive medicine. Louise Brown, the first baby conceived through artificial insemination (in vitro fertilisation, or IVF),



Bärbel Friedrich

“To the public, a lot of it sounds like magic. We have to openly discuss opportunities and risks, we have to be transparent. After all, the goal is to build trust.”

Photo: Markus Scholz

was born in England 40 years ago. Tanner remembers what a sensation this was: “In the history of human civilisation, there had never been an embryo outside of the womb.” The procedure raises questions. From which development stage on should an embryo be protected? What happens with unused fertilised eggs? Developing a clear position is not easy, even for Tanner. “It means a lot of reading! But there are still no unequivocally good solutions.” The 1990 German Embryo Protection Act prohibits using embryos for research.

Genome editing – the revolution

“The law restricts research,” complains Friedrich. “We’ve lost our leading role internationally.” She talks about a study which compared early embryogenesis in mice and human beings and found vast differences between the two. “That goes to show that some studies can only be carried out using human cells!”

In recent years, the Leopoldina has set a whole series of debates on genetic research in motion, for example with the

discussion paper “Ethical and legal assessment of genome editing in research on human cells” in 2017. A new method of genetic engineering called CRISPR/Cas9, or genome editing, which was first presented in 2012, is the reason why many questions are now being discussed again. “It’s a true revolution!”, stresses Prof. Dr. Jörg Vogel ML, a molecular biologist and one of the leading global experts in RNA biology. “It allows us to switch genes off or exchange them quickly, accurately and effectively. The potential is huge.”

Customised humans?

Genome editing allows us to make very specific changes to a person’s genetic makeup. Scientists are hoping that it will initially enable them to cure hereditary diseases that are associated with just one gene, such as Huntington’s disease or cystic fibrosis. Gene therapy has been used for a good 20 years, but there is a significant risk that these alterations to the genome will cause the patient to develop cancer. “It looks as if these side effects of genome editing are going to be much smaller,” says Vogel. He adds: “Science enables us to live a healthier, longer life. This is something that I, as a scientist, can give back to society.” Tanner has a more sober view of genome editing: “Many a revolution has been proclaimed over the last 20 years,” he reminds us.

But aside from what is feasible: what should be allowed? Vogel has a clear answer: “The limit should be human genetic enhancement. And in my opinion, the germline should not be touched for now!” Genetic changes to the germline are changes to egg cells, sperm cells and their precursors – changes that can be inherited by subsequent generations. This kind of intervention is prohibited under the Embryo Protection Act. Friedrich says: “I can imagine that these kinds of interventions would make sense for the most severe genetic diseases, once the method is sufficiently safe and all the obstacles have been overcome!”

Are we heading for customised humans? Genome editing opens up a great many possibilities. For example, says Taupitz: “Should blind people be allowed to intentionally have a blind child so that he or she is not an outsider in the blind community?” In a free society, legal prohibitions on both particular applications

and basic research have to have a clear rationale, he explains. “Scientific freedom is rooted in the German constitution. We have to constantly weigh the freedom of research against the infringement of the rights of others.” The possibilities of reproductive medicine have fundamentally changed over the last few decades, as has public opinion. As a result, a Leopoldina Working Group is calling for a law on reproductive medicine. Taupitz was the speaker for the authors of the 2017 discussion paper “A law on reproductive medicine for Germany”: “We need a law of this kind because our physicians are prevented from carrying out a lot of procedures that are standard treatments in other countries.” The discussion paper



Jochen Taupitz

“Should blind people be allowed to intentionally have a blind child so that he or she is not an outsider in the blind community?”

Photo: Christof Rieken

urges German politicians to rethink the prohibition on egg cell donation, and to debate embryo research and surrogacy. “As part of these discussions, we also have to address misconceptions,” says Tanner.

“Among the general public, there’s this deeply rooted idea that genes are like building blocks. But a cell is not a set of Lego bricks!” Tanner calls for honest communication. “Yes, but to the public, a lot of it sounds like magic,” says Friedrich. “We have to openly discuss opportunities and risks, we have to be transparent. After all, the goal is to build trust.”

BY CHRISTINE WERNER

Reconciling digitalisation and democracy

The Standing Committee “Digital Society” investigates technological change.

In Germany, the discussion about digitalisation is dominated by fear. Some people are afraid of Germany being left behind by international developments, others are afraid of the social, psychological and political effects of the changes. And the two camps very rarely speak to each other. But that’s exactly what we need to do. The Leopoldina’s Standing Committee “Digital Society” has set itself the task of promoting this type of dialogue. The Committee’s chairman, Prof. Dr. Thomas Lengauer ML, makes it clear: “We are not fighting a holy war for or against anyone.”

Lengauer was Director of the Max Planck Institute for Informatics in Saarbrücken until the end of May 2018. His research mainly focuses on bioinformatics for understanding and curing diseases. He has been a member of the Leopoldina since 2003 and was happy to take over the chair of the Committee, which has 13 members and is the first Standing Committee with a technological focus. The members come together twice a year. So far, the debate has mainly revolved around what Lengauer calls “topics for reflection”. These are epistemological questions, such as whether big data can replace the process of developing scientific theories – his answer to that question is a resounding “no”. The most important issue of all is how society is handling new technologies. For this reason, the Committee comprises not just computer scientists, but also psychologists and sociologists.

There is a fundamental conflict between the rigorous processes of the Standing Committee, which may seem somewhat leisurely to the casual observer, and the rapid technological change that is the focus of its work. But Lengauer does not consider it his job to be constantly chasing after the latest internet trends. “I see us as a body which recognises emerging developments early on and sounds the warning bells, saying: ‘Here’s what to expect. Prepare yourselves before it’s too late!’”

Ideally, then, this thorough reflection is applied to topical issues, as was the case at the symposium “Digitalisation and its Effects on Individuals and Society” in Berlin in July 2017. Long before the scandal surrounding Cambridge Analytica’s misuse of Facebook data made headlines



Thomas Lengauer at the Science Course for Journalists “Data – Resource of the Future?” at Stanford University

Photo: Ross Marlowe

in the USA, the psychologist Michal Kosinski, who developed the methods used by the British company to psycho-analyse Facebook users, was a speaker at the Leopoldina.

According to Lengauer, the most effective way to fight any undesirable developments in digitalisation is through education and the promotion of digital skills. He has identified five such skills: a certain level of technical know-how; critical thinking abilities; a competent approach to one’s own data and other people’s; the specific social skills that are needed in a world where privacy and autonomy are taking on new meanings; and, last but not least, a command of “netiquette”. Lengauer strongly believes that civilised communication on the internet is possible.

Do the political decision-makers in Berlin listen to the Leopoldina’s advice? “We have no cause to complain,” says Lengauer, “although in this case success cannot be measured as directly as for a doctor whose patients express their gratitude directly, by sending flowers, for example.” The Leopoldina takes digitalisation seriously. This is reflected by the fact that one of the Leopoldina’s five Science Courses for Journalists, “Diving into Science”, is dedicated to the topic. Over a period of two years, 15 journalists took part in a training course entitled “Data – Resource of the Future?”.

And when the German President Frank-Walter Steinmeier visited the Leopoldina in February, he created a link between digital technologies and concerns about democracy. “It is about nothing less than restoring political maturity in this digital world, and ensuring digital emancipation everywhere that ignorance, dependency and heteronomy have taken root.” With its Standing Committee, the Leopoldina aims to help our society make use of the benefits of digitalisation whilst limiting the risks involved.

BY CHRISTOPH DRÖSSER



Photo: Andreas Lander

Minister President of the Federal State of Saxony-Anhalt Dr. Reiner Haseloff on 10 Years National Academy

“The vital significance of the German National Academy of Sciences extends far beyond our Federal State. The Leopoldina serves as an important bridge between science and the society at large. The inexorable scientification of both the world and our lives poses major new challenges for policymakers. They need smart, independent scientific advice that is unaffected by the capriciousness of legislative periods. I am immensely grateful to the Leopoldina for fulfilling this task.”

Societal change in the spotlight

The Leopoldina continuously contributes to the discussion of demography and socialisation.

In Germany, “demographic change” was long equated with falling birth rates and a rising life expectancy. But perceptions have become more positive. “We are no longer obsessing about the drawbacks of old age, we are also looking at the opportunities,” summarises Prof. Dr. Ursula



Ursula M. Staudinger is speaker of the Standing Committee “Demographic Change” and was Vice President of the Leopoldina until 2017.

Photo: Bettina Ausserhofer

la M. Staudinger ML. For a decade, she researched the topic in her role as Vice President and speaker of the Standing Committee “Demographic Change”, and as co-speaker of the two Working Groups

“Ageing in Germany: More Years, More Life” and “Future with Children”, which were set up by the Leopoldina together with acatech and the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW) and supported by the Jacobs Foundation. At the same time, Staudinger contributed to a number of instrumental publications in her role as author and editor. The first project was comprised of the nine-part series “Ageing in Germany” in 2009, followed by the statements “Future with Children” and “Medical care for older people” in 2012 and 2015 respectively, as well as the discussion paper “Good life or good society?” in 2017.

These publications helped introduce the concept of “years gained” into the public discourse. The “new old” people being much healthier and more productive than previous generations opens up entirely new possibilities – both for individuals and for society as a whole. Staudinger, who is Founding Director of the Robert N. Butler Columbia Aging Center at Columbia University in New York, summarises the consequences thus: “We are in favour of a life-long perspective which looks at this longer lifespan in its entirety and makes concrete suggestions for easing the burden of middle age, a phase when many people today are finding it hard to cope.”

Against this background, the Leopoldina has gone on to identify conditions for exploiting people’s full intellectual and social potential and initiated the Working Group “Neurobiological and psychological factors in socialisation” together with the Union of German Academies and acatech. The results were presented in the 2014 statement “Socialisation in early childhood”.

Prof. Dr. Frank Rösler ML, one of the two speakers of the Working Group and member of the Leopoldina Presidium, stresses: “There is a window of time in early childhood where certain learning and life experiences must take place. Without them, the child’s development will remain incomplete.” He concludes that it makes particular sense to invest enough in early childhood education and to ensure a high grade of professionalism in this field. More recently, new demographic trends have taken centre stage. The

effects of digitalisation on employees and businesses, on education and the labour market are being discussed, the costs and quality of health and nursing care need to be balanced, and new conflicts are emerging in social policy concerning migrant flows and protection for refugees. As a result, we now have to discuss “demographic change in all of its aspects,” stresses Staudinger.

One of these aspects was recently explored by the Berlin-Brandenburg Academy of Sciences and Humanities and the Leopoldina in their statement “Traumatised refugees – immediate response required”, focusing on people who become ill, both physically and mentally, as a result of war, violence and other threats. The statement calls for swift, appropriate and easily accessible treatment. “Refugees



Frank Rösler is member of the Leopoldina Presidium and has been Secretary of Class IV: Humanities, Social and Behavioural Sciences since 2010.

Photo: Christof Rieken

who suffer psychologically are often unable to cope with everyday life, to establish relationships built on trust, or to learn a new language,” Rösler explains. Effective psychosocial help has to be immediate in order to make integration into our educational system, our labour market and our social structures possible. “Our intention is to show that we have a problem here which affects society as a whole.”

BY LILO BERG AND DANIELA WEBER

Biodiversity and energy systems

Fundamental environmental issues require interdisciplinary approaches.

All the media reported on it, and it was even discussed in the German parliament: the 75 percent decline in the number of flying insects which was revealed by citizen scientists and statisticians working with the Krefeld Entomological Society across several federal states. This sensational news was followed by equally loud calls for better protection of insects.

The biologist Prof. Dr. Katrin Böhning-Gaese ML, Director of the Senckenberg Biodiversity and Climate Research Centre, closely followed the discussion but did not feel that all relevant aspects of the issue were covered. Together with Prof. Dr. Alexandra-Maria Klein and Prof. Dr. Wolfgang Wägele, she set up the Working Group “Species decline in the agricultural landscape” at the Leopoldina, in collaboration with acatech and the Union of German Academies.

The Working Group first met in mid-June and consists in equal proportions of researchers in ecology, agricultural and social scientists, and representatives of



Katrin Böhning-Gaese

“Species extinction needs public attention.”

Photo: Markus Scholz

the German Federal Offices and departmental research establishments, in order to account for the interface between theory and practice. “We’ve brought together a diverse group of scientists, which allows us to cover a broad range of aspects,” says Böhning-Gaese. This should make it possible to consider as many viewpoints as



The Working Group “Species decline in the agricultural landscape” puts the changes in biodiversity in the spotlight.

Photo: elkeneize Eelke Jongejans – stock.adobe.com

possible. The Working Group will establish the state of animal and plant species in Germany’s fields and meadows, and analyse the causes and potential effects of the decline in the number of species. “We don’t just want to find out why species such as the common partridge and the lapwing are becoming more and more rare, we also want to know what the effects are on the functioning of the ecosystem and on humans,” the biologist explains. Do we need to modify laws and framework directives in Germany and the EU? Is there an implementation gap in Germany? What is going awry with EU agricultural subsidies? The Working Group will compile answers to these questions and publish them in a statement.

While Böhning-Gaese’s Working Group examines animal and plant species, Prof. Dr. Rudolf Amann ML is primarily concerned with researching the diversity of microorganisms, down to single-cell organisms. The Director of the Max Planck Institute for Marine Microbiology in Bremen is not just fascinated by their sheer diversity, but also by the new possibilities opening up in taxonomy. “Around 14,000 species of bacteria have been described; however, state-of-the-art molecular biological methods are able to bring up that number by a factor of 1,000,” Amann explains. High-throughput sequencing in

genomics and proteomics allows us to analyse the process of speciation at the level of the entire genomic information.

Investigating biodiversity through taxonomy

The effects of these “Omics” technologies (including genomics, metagenomics, metabolomics and proteomics) on taxonomy were investigated by a Leopoldina Working Group set up by Amann. In 2014, the Working Group published its first Leopoldina Report on Tomorrow’s Science, titled “Life sciences in transition – challenges of Omics technologies for Germany’s infrastructure in research and teaching”. The authors conclude that Germany is not prepared for the rapid development of Omics technologies and that genomics, bioinformatics and systems biology are at risk of collapsing due to a lack of long-term financing strategies. They recommend launching a national Omics and IT infrastructure to link universities with non-university research institutions.

Another problem is the high volume of data produced by these new technologies. “The surge in data volume does not automatically mean that we understand more,” Amann warns. For this reason, the Leopoldina recommends creating in-

ternational standards for the collection, processing and storing of data as well as quality monitoring.

The Report on Tomorrow’s Science also outlines the potential benefits of Omics technologies for life sciences. This is a message which research sponsors have obviously taken notice of. Last year, the German Research Foundation started financing the priority programme “Taxon-omics: New approaches for discovering and naming biodiversity” at the Ludwig-Maximilians-University in Munich.

The Senckenberg Nature Research Society, the Universities of Frankfurt and Giessen and the Fraunhofer-Institute for Molecular Biology and Applied Ecology opened a research centre at the beginning of 2018, which has the aim of extending biodiversity research to include the genomic basis of biodiversity. “The new Omics technologies are driving taxonomy forward because they will soon allow



Rudolf Amann

“The new Omics technologies are driving taxonomy forward because they will soon allow much more accurate analysis of how new species evolve.”

Photo: Werk1.de

much more accurate analysis of how many species exist in one location and how new species evolve,” Amann explains.

A statement by the Leopoldina Working Group “Bioenergy” in 2012 sparked a heated discussion amongst politicians, scientists and the public. The general euphoria about the use of bioenergy, in other words energy produced by incinerating non-fossil, plant-based biomass such as wood, or from biofuels such as biodiesel,

rapeseed oil or ethanol, was punctured by the Leopoldina’s critical appraisal entitled “Bioenergy – opportunities and limitations”. The Leopoldina drew on its scientific expertise to offer a new outlook in the discussion about the importance of bioenergy for the energy transition.

Energy supply of the future

As a sustainable source of energy for Germany, bioenergy does not provide a viable contribution to the energy transition, either now or in the future, according to the Leopoldina. They found that it requires more surface area than photovoltaics, wind power and solar thermal energy and often also produces higher greenhouse gas emissions and has a stronger environmental impact.

The Leopoldina Working Group, which was set up in 2010, also described in detail the looming competition for agricultural areas between the cultivation of energy crops such as rapeseed or corn, and the cultivation of food and feed plants. The statement triggered a fundamental debate between opponents and proponents of bioenergy. The Leopoldina invited representatives from politics, science and various associations to a discussion event.

In the aftermath of the Fukushima nuclear disaster, the Leopoldina also helped to fuel the debate about energy supply. In June 2011, a mere three months after the core meltdown at the Japanese nuclear power plant, the Leopoldina presented recommendations to the Ethics Commission on a Safe Energy Supply set up by the German Chancellor, Dr. Angela Merkel. Two years later, acatech, the Union of German Academies and the Leopoldina launched the initiative “Energy Systems of the Future” (ESYS) – a mammoth project bringing together more than 100 experts in interdisciplinary Working Groups to prepare options for the implementation of a safe, affordable and sustainable energy supply.

Raise public awareness

Prof. Dr. Ferdi Schüth ML, Director of the Max Planck Institute for Coal Research, describes. “The energy transition requires scientific support. Much of what was previously said on the issue was not exactly characterised by a high degree of

expertise,” explains Schüth, who headed the ESYS Working Group “Interactions within the energy system”, among other roles.

“ESYS shows that complex societal issues like the energy transition need and benefit from science-based support,” Schüth adds. Also Böhning-Gaese is optimistic that the planned statement will be noticed by society at large, just like the



Ferdi Schüth

“The energy transition requires scientific support. Much of what was previously said on the issue was not exactly characterised by a high degree of expertise.”

Photo: Markus Scholz

ESYS studies. “Species extinction needs public attention,” she states. We often forget that the decline in the number of species not only has a financial impact on agriculture, but that the disappearance of entire species will also have a psychological and emotional effect on humans, says Böhning-Gaese: “Butterflies and birds also contribute to people’s well-being.”

BY BENJAMIN HAERDLE

Choosing the best in their fields

Gunnar Berg, Vice President of the Leopoldina, discusses the selection of new members.



Gunnar Berg has been Vice President of the Leopoldina since 2010.

Photo: David Ausserhofer

The Leopoldina only accepts the best scientists in their respective fields as members. How are the members selected and how are they organised? Vice President Prof. Dr. Dr. Gunnar Berg ML explains.

Mr Berg, you are a member of the Leopoldina's Presidium. What does the Presidium's work involve?

The Presidium deals with questions of content. For example, we have to decide which topics to publish statements on. We also discuss issues concerning classes and sections, and, of course, the selection of members. The Presidium has the last word here too.

Members are grouped into four classes. What does that mean?

Class is an academic term that covers scientific disciplines. We have four classes, divided into a total of 28 sections. The sections could be compared to school subjects – chemistry, physics, earth sciences.

Originally, there were only two classes: natural sciences and medicine. The other two were added in the mid-1990s. Why is that?

Looking back, it was lucky for us that we didn't have any other classes prior to 1990. That meant that we didn't have anything to do with social sciences,

as they were called in East Germany, which saved us a fair amount of trouble. When the Leopoldina began to provide policy advice, it became clear that natural sciences and medicine alone were not enough for us to do justice to the role, because even topics that are firmly rooted in natural sciences or medicine always have an impact on society.

Economic, psychological, political and ethical issues all play a major role.

The members of the Leopoldina are outstanding scientists. How do you ensure that only the best are selected?

Each class is allowed to propose a certain number of new members every year. But at least three members of the class have to back a proposal before it can be submitted to the Presidium for a decision. This means that the class has to agree on their proposals, which is difficult because there are always many more proposals than places available. We often have lively discussions. For the final round of the process, each

class can only nominate as many scientists as there are places.

With such rigorous preparations for the selection process, does the Presidium ever reject candidates?

Oh yes, certainly! The Presidium is more than just a rubber stamp – we really do take a thorough look. We're familiar with all the proposals and we sometimes ask nitpicking questions. It isn't always easy, because of course the scientists up for consideration are all extremely capable!

Which member – and their research – do you find particularly fascinating?

All of them! However, I'm a physicist, so I find Stefan Hell's work truly outstanding.

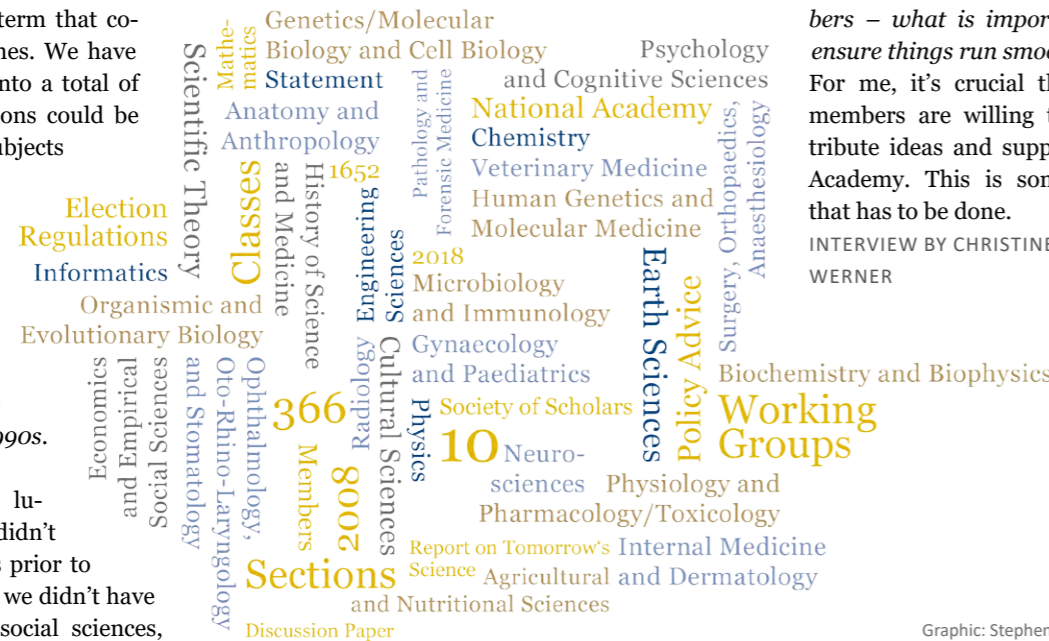
The same Stefan Hell who received the Nobel Prize in 2014 for developing super-resolved fluorescence microscopy.

Yes – but he was already a member before he was awarded the Nobel Prize. What impresses me about Stefan Hell is that he took the classic method of microscopy and developed it to the point that he really transcended boundaries. Female scientists whose work I find particularly interesting include Antje Boetius, who does fascinating marine research, and the physicist Petra Schwille, who is working on reconstructing a cell in its original form.

Classes, sections, more than 1,500 members – what is important to ensure things run smoothly?

For me, it's crucial that the members are willing to contribute ideas and support the Academy. This is something that has to be done.

INTERVIEW BY CHRISTINE WERNER



Graphic: Stephen Ruebsam

Getting scientists talking

The Leopoldina Centre for Science Studies facilitates interdisciplinary projects since 2012.

The range of disciplines covered by the Leopoldina as Academy of Sciences comprises almost all areas of research; in keeping with the Academy's centuries-old tradition, the largest group by far is made up of the natural sciences and biomedical subjects. When the Leopoldina was named National Academy, it was emphasised that the particular task of an Academy is to provide the space and the time for interdisciplinary debates.

The Academy has the obligation to explore scientific and societal issues in both a historic and a modern context. Even back in 1652, the Academy's founding fathers saw it as their task to recruit the most distinguished members in order to promote the research of the day and to publish, thereby establishing a broad scientific discourse which went beyond the limitations of the respective discipline. The objective was to inspire these excellent scientists to think collaboratively.

This remains the Academy's goal today as a learned society – and to accomplish it, the history of science and medicine is just as important as epistemology and philosophy of science. The Leopoldina Centre for Science Studies was founded in 2012 with the goal of bringing together the various activities in these fields and providing "thinking space" for historical

and modern issues. The research at the Centre for Science Studies has three primary objectives. Firstly, the Centre examines the Leopoldina's history with a focus on its scientific discourse, its importance for scientific policy and its international connections, while always considering how historic circumstances, conflicts and insights can be relevant to modern issues.

The Centre's second objective is to enter into dialogue on transdisciplinary issues with representatives of medicine, natural sciences and life sciences in order to ask critical questions concerning science studies, the self-reflection of the sciences. This also makes a fundamental contribution to the Leopoldina's policy advice. All scientists involved must be aware that they are operating in an area of conflict between science and politics, in order to be able to offer independent, science-based policy advice. The third objective is research. The Centre for Science Studies initiates and supports dedicated



Heinz Schott is Presidium Appointee for Archive, Library and Long-Term Projects.

Photo: David Ausserhofer

research projects, such as the long-term project working on the correspondence of the evolutionary biologist Ernst Haeckel, which is receiving funding from the Union of German Academies. His complete correspondence is being transcribed, digitalised and published with annotations.

The Centre for Science Studies helps to strengthen the Leopoldina's image as an active Academy of Sciences, thanks to public events and externally funded projects as well as to visiting scholars and fellows who spend some time working on their research projects in Halle, enriching the Leopoldina's work with their presence. The Leopoldina's work also enjoys public exposure thanks to a fellowship programme aimed at international academics and a new summer school which is set to continue long term. The international clout of the Centre for Science Studies is reflected particularly clearly by its joint projects with other national Academies, such as the Royal Society (London) and the French Académie des sciences (Paris).

BY PROF. DR. HEINZ SCHOTT ML AND PROF. DR. RAINER GODEL

RAINER GODEL IS HEAD OF THE LEOPOLDINA CENTRE FOR SCIENCE STUDIES.



"World Views. From Globe to Globalisation" was the title of an exhibition organised at the Leopoldina Centre for Science Studies in 2013.

Photo: Markus Scholz

We're lucky to have this house

Jutta Schnitzer-Ungefug, Secretary General, on the Leopoldina's Main Building in Halle

The Leopoldina's Main Building, which is also referred to as the "White House", is located on Jägerberg in Halle an der Saale. Prof. Dr. Jutta Schnitzer-Ungefug describes how the imposing building has become a place for scientists and researchers to meeting and share ideas in the years since 2012.

These days, the Leopoldina's "White House" is well known far beyond Halle. How did this come about?

It was a stroke of luck that allowed us to make the building our home in 2012. The federal state government made it possible for us to purchase the house, which was in need of renovations. The federal government then supported the renovation work as part of its stimulus package. Today, it's a wonderful home for us and has certainly made its mark on the public too. The building also reflects how deeply rooted the National Academy is in the state of Saxony-Anhalt and in Halle in particular.

The National Academy is headquartered in the state of Saxony-Anhalt. Don't some of your guests ask why Halle was chosen over Berlin?

Yes, that's a question we hear relatively often. It has to do with our history. The Leopoldina initially moved around the country, following each new President to a new university town. In 1878, the Leopoldina had a President from Halle for the second time. And from that time on, we never left.

Around 130 men and women work at the Leopoldina. Some of them have told us what makes their work so special. The administrator Stefanie Schneider says that entering the "White House" for her job interview was an "amazing feeling". For her, working at the Leopoldina means that she has found her place. At the Annual Assemblies, she also picks up on issues such as demographic change. "That concerns all of us." And when she is on the tram, her little daughter calls out at the Leopoldina's stop: "Look, mummy, that's where you work! And it is a great feeling to say: 'Yes, that's where I work.'"

"It's my dream job," says Dr. Danny



Jutta Schnitzer-Ungefug, Secretary General of the Leopoldina Photo: David Ausserhofer

And why should a National Academy automatically be located in the capital city? Having a little distance from the world of politics can even be a good thing. We receive plenty of support from the federal state government in Berlin but our work develops here in Halle. And that's the way we like it.

What effect does the Leopoldina have on Halle as a place of scientific research?

There is a diverse range of research being carried out in Halle. There are not many cities this size that boast such a large number of Fraunhofer, Leibniz and Max Planck Institutes as well as a prestigious university. We interact with all of them and we often hold joint events. The Academy is not an ivory tower, it has an effect on its surroundings. Part of giving policy advice

"My dream job Leopoldina" thought that I would one day be working here". He is now around as an

Weber. As Head of Archive and Library, he maintains two kilometres of shelves containing documents on the history of the Leopoldina, amongst them the privilege granted by Emperor Leopold I in 1687. He is convinced that "original documents have a unique aura, and archived objects are as close as you can get to historic reality". This is why it is so important to preserve the documents for future generations, he says.

When Torsten Thielemann celebrated his coming-of-age ceremony in the ballroom in 1984, he "never would have

is being in touch with ordinary citizens. A government can only pass successful laws when they have the support of the people. In this context, we see ourselves as a place for dialogue and communication.

The Long Night of the Sciences is a very special event held every year ...

Yes, once a year we prepare a special programme to display the Academy in all of its diversity. We also organise Heritage Day and regular tours of the building. I particularly value working with young people, seeing the enthusiasm in their eyes. I'm constantly impressed by the kind of questions and ideas they come up with. We need to motivate these young people so that in time they might choose a career in the sciences. We have to focus our efforts on the future of our society. Our children and young people.

So the Leopoldina's work concerns the future of our society?

The sciences are changing, they are becoming more diverse and more complex. It is up to us to explain these complex issues in a way that people can understand. This is going to be crucial.

What are your hopes for the future of this building?

I hope that a great many enthusiastic people will come here and see how essential the sciences are for our collective future.

INTERVIEW BY CHRISTINE WERNER

366 years as an independent academy and society of scholars



1652

Founding

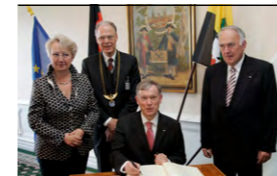
The "Academia Naturae Curiosorum", the oldest continuously existing academy in the world today, is founded in Schweinfurt/Germany. Together with leading scholars of their time, the founders set out to "... explore nature for the glory of God and the good of mankind". Motto for this ambitious goal is *Nunquam otiosus* (Never idle).



1878

Settling in Halle

After years of travel while changing location following its respective president, the Leopoldina eventually settles in 1878 in the Prussian university town Halle on the river Saale.



2008

National Academy

The German Academy of Natural Scientists is appointed to the German National Academy of Sciences on 14 July 2008. In the presence of Federal Minister of Education and Research Annette Schavan, Leopoldina President Volker ter Meulen and Minister President of Saxony-Anhalt Wolfgang Böhmer (f.l.t.r.), the President of the Federal Republic of Germany Horst Köhler (sitting) signs the guest book as patron of the Leopoldina.



2011

Renewable energies and preimplantation genetic diagnosis

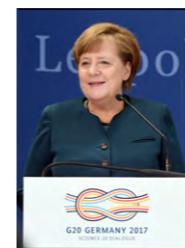
The statement on preimplantation genetic diagnosis discusses legal regulation and a possibly limited authorization of this procedure. An ad hoc statement provides energy and research policy recommendations after the events in Fukushima.



2012/13

Bioenergy

The statement elaborates on the chances and limits of bioenergy.



2017

Summit consulting

In cooperation with other National Academies, the Leopoldina provides scientific advice to the G7 and G20 summits. German Chancellor Angela Merkel speaks at the presentation of the recommendations of 2017.

1677/87

Imperial recognition and independence

Emperor Leopold I. recognises the Academy with the Imperial Signum by confirming its statutes and guarantees independence from the ruling dynasties of the individual countries. The Leopoldina is endowed with the Imperial Privilege, inter alia, complete freedom of censorship for their publications. The Academy carries the name Leopoldina ever since.



1933–1989

Time of National Socialism and the GDR

The era of National Socialism also leaves its mark on the Academy. Members and the leadership of the Academy alike yield to the Nazi regime. The Leopoldina is able to largely preserve its independence during the GDR years. The history of the Leopoldina during the first half of the 20th century was examined in a research project at the Humboldt University in Berlin.



2010

The XXVI. President

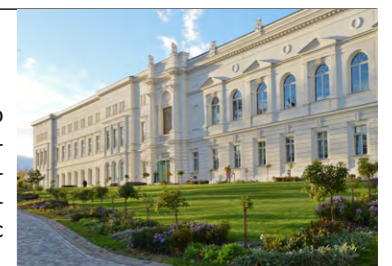
Jörg Hacker becomes the first full-time President of the Leopoldina, seen here on the day of the hand-over ceremony with the chain of office, which was donated in 1955 by members from West-Germany and the founding town of Schweinfurt/Germany.



2012

New headquarters

The Leopoldina relocates to its new headquarters at Jägerberg in Halle (Saale). More centrally positioned, the Leopoldina now gains greater public awareness.



2015

Genome editing and palliative care

In 2015 the statements on palliative care in Germany and on the opportunities and limits of genome editing received the biggest response.



2018

Central topics

Important topics the Leopoldina addresses are digitalisation and reproductive medicine. All topics and publications of the Leopoldina at www.leopoldina.org/en/science.





www.leopoldina.org