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Editorial

Dear Members and Friends of the Leopoldina,



2016 has been an eventful year for the Academy. I would like to briefly mention a few highlights here from the diverse range

of themes and wealth of events this year has seen.

In 2016, it was the Leopoldina's turn to chair the Alliance of Science Organisations in Germany. Alongside statements on issues such as open access and the promotion of young scientists, the Alliance initiative "Understanding animal research" was also launched this year. The Academy's science-based policy advice focused on issues such as population-based longitudinal studies and the relationship between medicine and economics.

Scientists from different parts of the world gathered in Halle in September for the Academy's Annual Assembly, whose central theme this year was "The Sciences in Intercultural Dialogue". The sharing of knowledge across national borders was also intensively promoted through collaboration with our partner academies. For example, we held joint symposia with the science academies of India, Korea and South Africa. Just recently, the Leopoldina and the Israel Academy of Sciences and Humanities organised a symposium on the topic of brain research and artificial intelligence, and the second Joint Science Conference of the Western Balkans Process took place in May.

This small selection of our activities all have one common goal – to provide society with independent advice based on excellent, cutting-edge scientific knowledge, on the national level and beyond.

I wish You a thought-provoking read.

Jörg Hacker



The speakers of the Leopoldina Symposium at the Saxony-Anhalt Representation to the Federation

photo: David Ausserhofer

The 2030 Agenda and the Role of Science

Leopoldina symposium on "The Turn to Sustainability?" in Berlin

On 18 October, more than 125 representatives from the fields of science, politics and civil society convened at the Saxony-Anhalt Representation to the Federation to discuss the role of science and the challenges involved for science policy and research funding in Germany in the implementation of the Agenda 2030 for Sustainable Development. The Agenda was adopted by the United Nations in 2015.

In her opening speech, Federal Minister for Education and Research Prof. Johanna Wanka, emphasised the key role of science in sustainable development.

The principle of freedom of research puts science in an excellent position to use its findings to provide society, business and politics with independent advice and contribute to the implementation of Agenda 2030. At the end of her speech, Leopoldina President Prof. Jörg Hacker handed Federal Minister Wanka the report of the UN Secretary-General's Scientific Advisory Board of which Prof. Hacker has been a personal member since 2014. The short scientific presentations in the morning focused on the key points of Agenda 2030: the world population, climate change, economic development, peace and cooperation. The speakers, including Prof. Wolfgang Lutz ML, UN Board Member

Prof. Carlos Nobre and Prof. Eva Kondrosi ML, outlined the contribution of their respective disciplines to the key points of the Agenda and emphasised that sustainable development will only be achieved if it is based on a comprehensive understanding of science.

The panel discussion in the afternoon was chaired by Dorothee Dzwonnek, German Research Foundation (DFG) Secretary General and centred on the implications of Agenda 2030 for science policy and research funding in Germany.

Dr Georg Schütte, State Secretary at the Federal Ministry of Education and Research (BMBF), stressed the potentially conflicting priorities between sustainability, freedom and excellence in science. Other speakers were DFG President Prof. Peter Strohschneider ML, President of the German Academic Exchange Service (DAAD) Prof. Margret Wintermantel, President of the Max Planck Institute Prof. Martin Stratmann and former Director General of CERN, Prof. Rolf-Dieter Heuer ML, and former spokesperson of the Junge Akademie, Prof. Sibylle Baumbach. The symposium "The Turn to Sustainability? The Agenda 2030 and its Implications for Science and Policy" was sponsored by the BMBF.

(chw)

“A trauma is always also an injustice“

Interview with Weizsäcker Award winners Maggie Schauer and Thomas Elbert

Dr Maggie Schauer and Prof. Thomas Elbert ML received the Carl Friedrich von Weizsäcker Award 2016 for their work in the field of psychotraumatology. Their systematic research on the consequences of extreme stress has produced important findings. They have developed effective methods of intervention that can help survivors of violence and human rights violations return to normal life and have thus contributed to the advancement of a peaceful society.

Ms Schauer, Mr Elbert, you have developed narrative exposure therapy. This is said to help victims of violence return to normal life. How does it work?

Schauer: It works if survivors are able to process their experiences by using special trauma treatment methods and if these experiences are also understood as human rights violations both in therapy and by society. A sexual assault or exposure to organised violence such as war and torture is always also an injustice. Recognising this is an integral part of the rehabilitation process.

Where is the therapy being applied?

Schauer: We developed this form of therapy together with Prof. Frank Neuner for countries where there are very few mental health structures, such as the crisis regions in Africa and Asia. We adapted the treatment to suit each cultural group and scientifically tested our procedures on a regular basis. However, even in Europe we are now confronted with the fact that we do not have adequate means to treat the psychological problems of the many traumatised people.

Elbert: Mental health treatment programmes can help communities with many traumatised persons get back on their feet. The World Bank is supporting a large-scale project of ours in Congo. One part of this project involves helping women who have suffered extreme sexual violence return to normal life. But we also asked ourselves what motivates the perpetrators to commit such atrocities? Based on our findings on this point we have developed a module to help members of armed groups to break out of the cycle of violence.



Maggie Schauer and Thomas Elbert are honoured by the Leopoldina and the Stifterverband.

photo: private

Mr Elbert, what organic changes occur as a result of trauma?

Elbert: The whole organism changes, even the brain goes through a process of reorganisation. Different processing routes in the brain are activated in traumatised persons. To fight for survival, the brain quickly switches into “alarm” mode. This is very stressful for the whole body. If this happens all the time and without reason as it does with trauma survivors, they soon become physically ill as well. With successful treatment, the brain switches back to “peace” mode.

There are also many traumatised people among the refugees coming to Germany.

Schauer: In our view, a mental health crisis is unfolding all over the world due to the many wars that are reaching far into civil society. There are a growing number of people in crisis areas whose parents were already subjected to war

and brutality and who are now at daily risk of violence themselves. The focus in these regions must be on mental health. This must also be taken into account when it comes to integration. I can't take part in an integration measure if I can't sleep or have flashbacks.

What does the Carl Friedrich von Weizsäcker Award mean to you?

Schauer: The award acknowledges the very essence of our work. And it also demonstrates the forward-looking approach of the Academy and the Stifterverband, and that they are aware of the huge task facing society. And with the Leopoldina...

Elbert: ... we have the backing of one of highest-ranking authorities in research – which gives our research findings more weight in the political debate.

INTERVIEW BY CHRISTINE WERNER

THE CARL FRIEDRICH VON WEIZSÄCKER AWARD

The Carl Friedrich von Weizsäcker Award of the Stifterverband is awarded to scientists or research teams whose work has made a significant contribution to tackling the great challenges facing society today. It is endowed with €50,000 and conferred eve-

ry two years, together with the Leopoldina. The award will be presented to Dr Maggie Schauer and Prof. Thomas Elbert ML on 13 December by Leopoldina President Prof. Jörg Hacker ML and Stifterverband President Prof. Andreas Barner. (jk)

The causes of educational inequalities

Class IV symposium and lecture on learning and education systems

This year's Class IV symposium, which took place on 17 November, was dedicated to the topic of educational inequalities. The event was jointly chaired by Prof. Gebhard Kirchgässner ML, Class IV spokesman, and former Class IV spokesman Prof. Gereon Wolters ML. Prof. Hartmut Esser ML gave the Leopoldina lecture on the preceding evening.

In his lecture on "Education systems and educational poverty: Does the (strict) differentiation based on performance really (only) reinforce educational inequalities?", Hartmut Esser ML (University of Mannheim) provided accessible criticism of the assumption that early differentiation in educational pathways significantly exacerbates social and ethnic disparities in educational attainment. He also went on to say that the binding nature of educational recommendations does not reinforce the impact of origin in the education system as educational inequality is sometimes driven more by parents from educationally disadvantage backgrounds not following the recommendation to send their children to an academic secondary school.

Lecture on medicine and education in the ancient world

The symposium on the following day began with a lecture by Prof. Karl-Heinz Leven ML (Friedrich-Alexander-Universität Erlangen-Nürnberg) entitled "enkyklios paideira, hobby doctors, idiotai – medicine and education in the ancient world." Leven provided interesting insight into the importance of education in the classical discourse and the dissemination of medicinal knowledge outside of the medical profession. Sections of the Corpus Hippocraticum, for example, were written for non-professionals and were intended to educate the interested general public in medical matters.

In the next lecture, Prof. Jürgen Mittelstraß ML (University of Constance) presented six theses on the future of education in a knowledge society. He said that education develops people's power of judgment and goes far beyond the mere accumulation of knowledge as such. This makes it indispensable as an orientation aid in a knowledge society, in order



New members of Class IV

The new members of Class IV were presented with their membership certificates on 17 November. From left: Leopoldina Secretary-General Prof. Jutta Schnitzer-Ungfug (Halle), Prof. Carsten Reinhardt ML (Bielefeld), Prof. Anne Maass ML (Padua, Italy), Prof. Karl Gegenfurtner ML (Gießen), Prof. Ulrike Hahn ML (Hamburg), Leopoldina President Prof. Jörg Hacker ML (Halle).

(jk)/Foto: Markus Scholz

to strengthen its understanding of itself, its history, its identity and its future. In this context, the humanities are an integral part of modern and mature societies as without their theories self-reflection would not be possible.

Are some educational disadvantages a historical constant?

A historical empirical perspective on the topic of educational inequality was provided by Prof. Heinz-Elmar Tenorth ML (Humboldt-Universität zu Berlin) in his lecture "The continuity of 'educational inequalities'". Based on developments over the course of the last 100 years, Prof. Tenorth demonstrated that the frequently claimed continuity of educational inequality does not, in fact, exist. For example, the structural disadvantage of the rural population in accessing education, which was postulated as recently as the 1960s,

is no longer an issue today. The exception to this trend towards equalisation are new social disparities, such as the emergence of a so-called risk group who do not have a school-leaving qualification.

The symposium was rounded off with a lecture by Prof. Wolfgang Schneider's ML (Julius Maximilian University of Würzburg) on "Approaches to educational equity in pre-school and school". Based on the findings of the PISA Study 2000, which concluded that language support schemes should preferably commence before children start school in order to compensate the disadvantages of "at risk children" with speech problems most effectively, he outlined some programmes and approaches to boosting language skills in preschoolers. He said that the findings made so far are very promising, but more long-term assessments of such studies are required to monitor their durability.

(amg)

Seminar programme for journalists hosted in Paris

Recent developments in infection research discussed at Institut Pasteur and Académie des sciences



In October, the Académie des sciences and the Institut Pasteur hosted the Infectious Diseases seminar programme for journalists, organised by the Leopoldina in partnership with the Robert Bosch Foundation. The event, which was also attended by Leopoldina President Prof. Jörg Hacker, gave 15 editors of renowned German media the chance to learn more both about the conventions of scientific diplomacy and about the latest developments in research on infectious diseases.

(dw)/photos: Antoine Antoniol /Robert Bosch Stiftung

First Chinese-German symposium on individualised medicine in Xi'an

The Leopoldina is intensifying its relations to Chinese partners. To this end, a cooperation agreement was concluded this year with the Chinese Academy of Engineering (CAE), the parent academy of the Chinese Academy of Medical Sciences (CAMS).

The first joint initiative launched as a result of the agreement was the First Sino-German Symposium on Individualised Medicine that took place in Xi'an, China from 9 to 12 October. Prof. Dr. Hans Konrad Müller-Hermelink ML, Prof. Dr. Xuetao Cao ML und Prof. Dr. Maode Lai ML were responsible for the scientific coordination of the symposium. Prof. Bärbel Friedrich ML opened the event on behalf of the Leopoldina President.

The event began with a discussion on the fundamental aspects of individualised medicine. Presidium member Prof. Thomas Lengauer ML spoke about the role of bioinformatics in the personalised treatment of HIV infections. Prof. Matthias Schwab ML presented research into individually divergent reactions to medication in the context of pharmacogenomics.

The core theme of the symposium was

individualised cancer treatment. Contributions to this topic included talks by Prof. Michael Hallek ML on chronic lymphocytic leukemia and by Prof. Peter Lichter ML and Prof. Andreas von Deimling on DNA sequencing in the treatment of brain tumours. Towards the end of the symposium, a broader view was taken by looking at the application of individualised treatment to lifestyle-based and rare diseases, for example through the talk by Prof. Jutta Gärtner ML on neurodegenerative diseases in children and young adults. Prof. Georg Ertl ML ventured an outlook into the future development of research on individualised medicine. He underlined the importance of information technology, while warning against ignoring both the individual welfare of patients and the social and ethical aspects involved.

The symposium showed that the field of individualised medicine is not yet receiving as much attention in China as it is in Germany, but that research in this area is steadily increasing. This topic is sure to play a central role in the future cooperation between the Leopoldina and CAMS.

(rn)

Support following flight and migration

The current flight and migration movements in Europe are also affecting numerous scientists who are leaving their home countries due to war and persecution. The Human Rights and Science symposium on "Human Rights and Refugees" was held by the Leopoldina's Human Rights Committee and the Slovenian Academy of Science and Arts on 29 and 30 September in Ljubljana to focus on this issue.

The participants first discussed the contexts and consequences of the latest migration of refugees to and within Europe. Various initiatives were then presented that support suppressed scientists and those seeking asylum. For example, the Alexander von Humboldt Foundation presented the Philipp Schwartz Initiative, which enables German universities and research institutes to offer researchers at risk a full scholarship for 24 months. The next Human Rights and Science symposium will be on the topic of "Human Rights and the Arctic" and take place in cooperation with the Council of Finnish Academies in September 2017 in Helsinki, Finland.

(jn)

Water management in urban regions

How do we want to live in the future? Twenty-six German and Brazilian young scientists discussed this central question in the context of the urban water sector in the workshop “How do we want to live tomorrow? – Perspectives on water management in urban regions” that took place in Essen from 4 to 7 October 2016. The event was organised by the Leopoldina, the Brazilian Academy of Sciences (ABC) and the Centre for Water and Environmental Research of the University of Duisburg-Essen (ZWU).

The young scientists from Germany and Brazil worked in groups and in plenary sessions to identify and discuss the most important research topics for the future of urban water management. The main themes were integrated water catchment area management, hazardous micro pollutants, sustainable wastewater treatment systems as well as information flows and public participation. Experts from science, water management and research funding gave additional feedback.

The results of the discussions will be



At a workshop on water management in urban regions, young scientists from Brazil and Germany

published as a science policy statement in spring 2017. Prof. Peter Fritz ML (Leipzig) and Prof. Klement Tockner ML (Berlin/Vienna) were responsible for the scientific coordination of the workshop on the part of the Leopoldina and Prof. José Tundisi,

São Carlos, on the part of ABC. The project was financed by the German Federal Environmental Foundation (DBU). The workshop in Essen was part of a series of events on the water sector initiated by the Leopoldina and the ABC. (jn)

German-African symposium in Berlin

Global spread of infectious diseases in focus

Infectious diseases can spread quickly nowadays due to people's increasing global mobility. Cross-border dialogue is therefore required on the causes and the containment and management of infectious diseases. The Leopoldina, the Academy of Science of South Africa (ASSAf) and the Max Planck Institute for Infection Biology (MPI-IB) held the symposium entitled “New Research Perspectives on Infectious Diseases in Africa and Germany” from 24 to 25 October 2016 in Berlin to discuss the latest scientific findings in HIV, tuberculosis, neglected infectious diseases and vaccines.

The event, designed for African and German young scientists, was coordinated by Prof. Stefan Kaufmann ML, MPI-IB, on behalf of the Leopoldina, together with Prof. Quarraisha Abdool Karim, Columbia University, US, and the University of KwaZulu-Natal, South Africa, on behalf of the ASSAf. The general public showed great interest in the symposium. A high-



Lively discussions during the symposium

photo: David Ausserhofer

light of the event was the evening panel discussion on “Ethical dimensions in clinical studies” with the participation of the German Chancellor's Personal Representative for Africa, Günter Nooke.

The symposium was financed by the Schering Foundation and the Robert Bosch Foundation. The next edition of the symposium is planned for 2018 in South Africa. (jn)

Policy advice on food security

The project on global policy advice on the topic of “Food and Nutrition Security and Agriculture” headed by the Leopoldina has produced its first reports. The project has received €1 million in funding from the Federal Ministry of Education and Research since 2015 and is directed by former Leopoldina President Prof. Volker ter Meulen ML.

Over a period of three years, the global network of 130 national science and medical academies – the InterAcademy Partnership (IAP) – is compiling regional science-based analyses and recommendations in Europe, Asia, Africa and America. The preliminary drafts of the respective reports from the four regions of the world have now been released. They will be summarised in a global report targeted at actors in the global policy regime such as the World Health Organization, the World Bank and the United Nations. (csd)

Personalia

Deceased Members

■ Stefan Jentsch ML

29 May 1955 to 29 October 2016 | Martinsried

Biochemistry and Biophysics

Stefan Jentsch, most recently head of the Molecular Cell Biology department at the Max Planck Institute of Biochemistry, researched the regulation of cellular processes by ubiquitin. Jentsch also carried out research on determining the X-ray structures of biomolecules. Stefan Jentsch was admitted to the Academy in 1998.

■ Susan Lindquist ML

5 June 1949 to 27 October 2016 | Boston, US

Genetics/Molecular Biology and Cell Biology

Molecular biologist Susan Lindquist researched the gene functions of neurodegenerative diseases such as Parkinson's and Alzheimer's using yeast proteins. Her interdisciplinary approach to the research areas of genetics and molecular and cell biology particularly distinguished her work. Lindquist was the first Director of the Whitehead Institute for Biomedical Research at the University Cambridge, US. Susan Lindquist became a member of the Leopoldina in 2004.

■ Manfred Neumann ML

15 December 1940 – 9 July 2016 | Bonn

Economics and Empirical Social Sciences

Manfred Neumann was one of Germany's most renowned economists and was also held in high international esteem. His academic work, particularly in the fields of monetary theory and monetary policy, made him an influential observer of the currency reform both in the scientific and in the social discourse. Manfred Neumann was elected to the Leopoldina in 1999.

■ Manfred Sumper ML

28 December 1942 to 23 October 2016 | Regensburg

Biochemistry and Biophysics

Biochemist Manfred Sumper was a pioneer in the field of evolutionary biochemistry. As well as discovering new protein classes in molecular biology – primarily the embryogenesis of *Volvox*, the reproductive behaviour of a type of multicellular green algae, Sumper researched the silicatisation of single-celled algae known as diatoms, whose cell walls are made of silica. Manfred Super was elected to the Leopoldina in 2000.

■ Jaques-Henry Weil ML

3 February 1934 to 6 October 2016 | Strasbourg, France

Genetics/Molecular Biology and Cell Biology

French molecular biologist Jacques-Henry Weil researched the protein synthesis of macromolecules in plants and investigated transfer RNA genomes in chloroplasts and mitochondria. As the founder and director of the Institute for Molecular and Cellular Biology of the CNRS in France, Weil also organised regular pan-European symposia and workshops for the European Molecular Biology Organization. Jacques-Henry Weil was admitted to the Leopoldina in 1987.



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Abbreviations:

ML = Mitglied der Leopoldina