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Dialogue between academia and society



Jörg Hacker, XXVI. President of the Leopoldina.

Photo: Karsten Möbius

Renewable energies – artificial intelligence – genome surgery: dig a little deeper, and hiding behind catchphrases like these you will find scientific discoveries and technological innovations which have already started to rattle the foundations of our society. But if these developments are to help shape our future, what objectives should they serve, and what methods should they employ? Before being able to discuss these questions in an informed way and reach responsible conclusions, it is important to have a wide range of the latest research findings readily available at your fingertips. That is why we have every right to expect science not only to make new discoveries, but to pass on this knowledge in a way which we can understand, and to establish reliable means by which the scientific world can enter into dialogue with the public and politicians.

Since being designated the National Academy of Sciences ten years ago, the Leopoldina has assumed a pivotal role in the dialogue between academia and society. The Leopoldina tackles a wide range of evidence-based issues which have serious repercussions for society, and will continue to do so – on a national and international level and in close collaboration with other academies and organisations. I would like to thank every scientist, whose dedicated voluntary work makes such activities possible in the first place, as well as the partners and sponsors who promote our dialogue with society.

In addition to expressing my gratitude, I have a request to make, which is related

to the fact that socially-relevant progress in pure and applied research is increasingly the result of interactions between specialist areas and fields of technology. One example is to be found where digitalisation meets the life sciences: we are able to use genome surgery to alter the genetic information of living creatures quickly and efficiently. This is opening up completely new potential applications, including in medicine, but an essential prerequisite is the ability to make an automated analysis of complex volumes of data. Thus (bio) informatics has assumed a vital role in advancing our knowledge in the field of the life sciences.

We must recognise such seminal forms of collaboration between disciplines at an early stage in their development if we want to help the public and politicians to assess their consequences for the worlds of life and work. That is why there is a need for scientists who are truly lateral thinkers – who recognise no boundaries between the disciplines in which they conduct their outstanding research. The future success of the Leopoldina will be bound up more than ever before with their dedicated work.

That is why I should like to ask you, our readers, to look beyond the well-trodden paths of dialogue between academia and society, and to join us in striking out in a new direction with a view to making early insights into the future lines along which research and research applications will develop in the future. This is the only way of ensuring that an academic hub such as the Leopoldina can successfully live up to its role in the highly integrated scientific community of the 21st century.

Jörg Hacker



Photo: German Federal Government/Steffen Kugler

Federal President 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.“

■ ALL VOICES

Action to assist traumatised refugees

Position paper by the Leopoldina and the Berlin-Brandenburg Academy of Sciences

Refugees arriving in Germany have often experienced enormous levels of violence before and during their flight, and may have lived through life-and-death situations or witnessed traumatising incidents. The circumstances in which they find themselves and the difficulties they encounter once they reach their destination can also cause psychological stress. Taken together, these experiences can be so difficult to cope with that a large number of refugees suffer ill-health, both physical and mental. The many refugees suffering from serious psychological stress require urgent help. Otherwise, this could lead to serious negative consequences: for the sufferers and their children themselves, and for society as a whole.

Refugees suffering from psychological stress are often unable to cope with everyday life, enter into trusting social relationships, or learn a new language. However, these activities are crucial if they are to integrate into society, work productively, and lead a fulfilling life.

In April the Leopoldina published a position paper on traumatised refugees and the urgent need for assistance, with a view to drawing attention to the above

issues and drawing up recommendations for politicians and society on how to provide more effective help to those affected in this way. Basically, it is a question of tackling the mental suffering of refugees at an earlier stage and with more appropriate strategies. A series of measures was outlined.

In order to identify more clearly who is actually in need of help and what treatment might be required in individual cases, the authors are calling for Directive 2013/33 of the European Union to be implemented in full in Germany. This directive requires people with a particular need for protection to be identified and given the appropriate care.

Some of the refugees in question will require professional trauma therapy adapted to their specific needs. But for many others, more rapidly available, low-threshold and easily accessible assistance might make a crucial difference. In particular, this includes the provision of psychosocial support, direct integration into social networks, and making targeted efforts to alter their behaviour.

There is also a need for the development and expansion of training oppor-

tunities for psychotherapists in the diagnosis and treatment of trauma-related disorders.

Overall, the care system in Germany is only partly ready for the treatment which needs to be provided. We therefore propose that the current care model be complemented: professional psychotherapy should continue to be offered only by licensed psychotherapists or psychiatrists. Additional low-threshold assistance could, however, be provided by specially trained individuals: so-called peer advisors.

These would normally be people familiar with both the language and cultural background of the affected party, but also with life in Germany. They could support, guide and advise refugees suffering from psychological stress as their 'health pilots', as well as liaising and interpreting for them, and explaining the German way of life. Following additional training as trauma advisors, certain elements of their treatment could be delegated to them, so that they could also support the recovery of traumatised refugees.

(hst, sw, kh)

Position paper considers artificial photosynthesis

If one generates energy from wind power or solar cells, it can prove technically challenging to store the excess power during strong winds or sustained sunshine. Artificial photosynthesis might be one way of solving this problem.

In the middle of May, the Leopoldina, acatech (the German National Academy of Science and Engineering) and the Union of German Academies of Sciences and Humanities presented a position paper on this very subject in Berlin. A recommendation was made to consider artificial photosynthesis in energy turnaround scenarios to a greater extent in the future. The process enables solar energy to be stored in energy-rich chemical bonds such as hydrogen,

methane, methanol or ammonia. The stored energy could then be released again as it was needed. In this way, even more complex substances – such as fossil fuels like coal, crude oil or natural gas – could be substituted as energy carrier.

The Academies regard artificial photosynthesis as a suitable way – but by no means the only one – of making energy and raw material systems more climate-friendly. Pure research should be better coordinated and combined with industrial research. Methods of artificial photosynthesis could be developed to the level of major technical applications, which would promise clear advantages over other alternatives. (ak)



Natural photosynthesis serves as a role model to store energy in chemical compounds.

Photo: Anthony Rossbach on Unsplash

Feeding the world: the threat caused by climate change

Leopoldina lecture and a Class II Life Science Symposium cover a broad spectrum of disciplines

On Wednesday 23 and Thursday 24 May, the members of Class II met for their annual scientific symposium at the Leopoldina in Halle (Saale). After certificates had been presented to the 18 new members, Prof. Dr. Joachim von Braun ML delivered the evening lecture.

The Leopoldina lecture delivered by Prof. Dr. Joachim von Braun ML (Centre for Development Research, Bonn) put it in a nutshell: climate change represents a threat to our ability to feed the world. Climate change is already a reality today, and Professor von Braun illustrated with great clarity how we can tell that it is man-made. Since 1750, some 2,000 billion tonnes of fossil carbon have been released into the atmosphere in the form of carbon dioxide. At the same time, the population of the earth has grown in leaps and bounds, and will probably number nine billion people by 2050. To feed them all, we would probably have to increase food production so that it covered the needs of twelve billion people – at least if today's consumer behaviour, the present inequitable distribution of foodstuffs in the world, and current levels of food waste remain unchanged.

Extreme weather events are already becoming more common

Professor von Braun went on to say that we should bear in mind that extreme weather events are already becoming more common and will continue to do so, and that the situation will become particularly critical, including – and especially – for agriculture. Extreme periods of drought will be more frequent, as will extreme flooding. Some of this will be caused by heavy local downpours, such as we are experiencing even here and now. Insurance companies are already recording losses in the billions of dollars per annum around the world. And this doesn't even take into account the uninsured losses suffered in the poorer countries which are often also the worst affected. In other words, the actual economic impact is probably considerably higher.

The agronomist from Bonn explained that food production plays a dual role in connection with climate change. On the one hand, agriculture itself makes a major

The new members of Class II



On Wednesday, 23 May, the new members of class II received their membership certificates. From left: Prof. Dr. Volker Haucke ML (Berlin), Prof. Dr. Dario Leister ML (Munich), Leopoldina Secretary-General Prof. Dr. Jutta Schnitzer-Ungefug (Halle), Prof. Dr. Bernd Fleischmann ML (Bonn), Prof. Dr. Dirk H. Busch ML (Munich), Prof. Dr. Katayoon Dehesh ML (Riverside, USA), Prof. Dr. Heyo K. Kroemer (Göttingen), Prof. Dr. Dorothee Kern ML (Waltham, USA), Prof. Dr. Helga Rübsamen-Schaeff ML (Wuppertal), Prof. Dr. Jens Brüning ML (Cologne), Prof. Dr. Joachim von Braun ML (Bonn), Prof. Dr. Bill S. Hansson ML (Jena), Prof. Dr. Erin Schuman ML (Frankfurt am Main), Prof. Dr. Julian Schroeder ML (La Jolla, USA), Leopoldina-Präsident Prof. Dr. Jörg Hacker ML (Halle), Baron Prof. Dr. Peter Piot ML (London, UK), Prof. Dr. Michael Sattler ML (Munich).

Photo: Markus Scholz

contribution to climate change through greenhouse gas emissions and its enormous consumption of water. On the other hand, agriculture is affected more than most other sectors by the repercussions of climate change.

So what can be done to ensure that the world has enough to eat in the future? An answer must be found to this question, according to Professor von Braun, irrespective of whether or not people believe what scientists have to say about the causes of climate change. There is no alternative but to change the way we farm.

New plant breeding and cultivation strategies

One important objective is to regulate water consumption so that yields remain stable even in regions which are becoming increasingly arid. Current forecasts show that the Mediterranean area and the Amazon region will suffer from more frequent droughts in the future. Professor von Braun also showed that new plant breeding

and cultivation strategies could stabilise agricultural production. At the same time, it is important to improve the carbon content of the soil by adopting more sustainable methods of cultivation.

He summed up by stating that there was no denying that it would only be possible to avert the most serious consequences of climate change and still be feeding the world in a hundred years' time if the international community works together on practicable political solutions, rather than individual nations attempting to deal with the problem on their own.

On the following day a total of 14 new members of the Leopoldina from Germany, Great Britain and the USA – all high-ranking specialists in the life sciences – talked of their latest research findings. The wide spectrum covered by their work was evident from their presentations on structural biology, infection research, cancer treatment, stem cell research, photosynthesis and cell transport routes. (hst)

More rigorous licensing procedures for pesticides

A group of Leopoldina experts discusses on environmentally-friendly plant protection

Synthetic pesticides are harmful to ecosystems and biological diversity. The risks associated with their use have been systematically underappreciated in the past. This was explained by a group of experts led by environmental chemist Prof. Dr. Andreas Schäffer (Aachen) in a discussion paper published by the Leopoldina in May: 'The Silent Spring – On the need for sustainable plant protection'. The scientists are calling for more rigorous licensing procedures for pesticides so that their impact on the environment can be managed more effectively.

Insufficient attention is paid to many of the ecological effects of pesticides in current licensing procedures. In particular, their harmful impact when used in practice is barely touched upon. This consideration is also reflected in the ban on three neonicotinoids which was ratified by the European Court of Justice and was also imposed in May.

Thus pesticides are constantly having to be banned years after they were licensed for use, because their presence can often be detected in the soil and waterways for much longer than was assumed at the time of licensing. The eleven experts are therefore proposing a measuring system which could be used to observe and verify the long-term effects of pesticides



Synthetic plant protection ensures high yields, for instance of maize. Yet the licensing procedures for pesticides upon which we have relied in the past have outlived their usefulness.

hoto: Samuel Zeller on Unsplash

on ecosystems – after they have first been licensed for use in a restricted area and for a limited period of time.

Moreover, it is often common practice in agriculture to apply more than one pesticide at the same time, yet insufficient research has been conducted into how a combination of different agents affects the environment. The authors recommend that licensing procedures for pesticides be adapted so as to take greater account of agricultural practice and the actual en-

vironmental situation when making risk assessments.

Finally, future investigations should examine how non-target organisms are affected by these agents. Taking the weed killer glyphosate and the group of neonicotinoid pesticides as examples, the group of experts was able to demonstrate the shortcomings of current licensing procedures and the changes which need to be introduced.

(ca, hst)

Evaluating reforms in the financial markets – lessons from research

Why and how is it possible to verify the efficacy of regulations systematically in some fields of policy, while in others this is (still) not the norm? This question was tackled by the Deutsche Bundesbank and the Leopoldina in late May at the workshop in Halle (Saale) on evaluating reforms in the financial markets by learning lessons from other policy areas and disciplines.

It was the first time either institution had collaborated with the other. The workshop was the brainchild of Prof. Dr. Claudia M. Buch and Prof. Dr. Regina T. Riphahn ML, Vice Presidents of the Bundesbank and the Leopoldina respectively. A large number of Academy members joined in as speakers and discussants.

Labour market policies, health servi-



Claudia Buch, Vice President of the Deutsche Bundesbank, summed up the outcome of the workshop with the Leopoldina. Photo: Deutsche Bundesbank

ces and family-related benefits, such as the parental allowance, are all subjected to academic evaluation. Regulation of the banks, however, lacks such scrutiny, despite being urgently demanded after the financial crisis. The G20 states agreed on an evaluation framework at a political level. The participants discussed what we could learn from our experience in the aforementioned areas.

One of the conclusions drawn by the workshop was that evaluation should be an integral part of any design of political regulations from Day One. Embedding long-term independent and verifiable impact studies in such regulations, perhaps by law, would be a helpful means by which one could identify the effects of policies.

(kp)

“It came as a complete surprise”

Volker ter Meulen recalls the days when the Leopoldina was designated the National Academy

Anyone listening to the radio on 16 November 2007 would have been among the first to hear the news: the Leopoldina was to be the National Academy of Sciences. The then President of the Deutsche Akademie der Naturforscher Leopoldina, Prof. Dr. Volker ter Meulen ML, found out during a visit to the Indian state of Rajasthan. “It came as a complete surprise – and of course I was absolutely delighted”, as he recalls ten years later.

This announcement by Federal Research Minister Annette Schavan took everyone aback in 2007. It had been expected that a new national academy would be established instead. Indeed, the German Council of Science and Humanities had pleaded for this in 2004. It believed that none of the existing academies was structurally capable of assuming the responsibilities of a national academy.

So wasn't the need for a national academy questioned in the first place?

Quite the contrary: the importance of such an institution was raised repeatedly – including in political circles. The former Chancellor Helmut Schmidt first supported the idea not long after reunification, and Federal Chancellor Helmut Kohl spoke out in favour of it in 1994 in a government statement. Scientific organisations also wanted a national academy to represent the interests of German science effectively on international committees.

The agonising debate culminated in the Minister's surprise announcement. But why was the decision made in favour of the Leopoldina?

Perhaps the 2007 G8 summit in Heiligendamm was partly responsible. In the run-up to it, the Leopoldina had invited the Presidents of the Academies of the G8 nations and five other states to Halle, so that they could formulate science-based



Volker ter Meulen, President of the Leopoldina, is handed the certificate on 14 July 2008 by Federal Research Minister Annette Schavan; the Deutsche Akademie der Naturforscher Leopoldina is now the National Academy of Sciences.

Photo: Jens Schlüter

position papers together on some of the topics to be raised at the summit. It became clear as a result that the Leopoldina was well able to handle this sort of policy consultation.

What sort of resistance had to be overcome? And who – or what – helped you in this?

Our main support came from Minister Schavan. She was a skilful proponent of the cause. Some of the federal states initially rejected the idea of appointing the Leopoldina. Yet only three months later, in February 2008, the decision was ratified unanimously in the Federal and State Commission. Federal President Horst Köhler was also a forceful supporter of the Leopoldina. The decision-makers were influenced by a historic alignment of the stars. It also helped our cause that at the time, about 30 percent of our members came from non-German-speaking countries. In 2010, the European Academies' Science Advisory Council (EASAC) relocated to Halle, which can be regarded

as a vote of confidence by the National Academies of the EU member states.

How do you see the position of the Leopoldina today?

It has developed exponentially over the last ten years. The Leopoldina is now an active working academy and society of scholars of national and international standing. It is represented on numerous international academic boards and is heavily involved in the preparation of scientific documents for German and global policy committees. Its collaborative ventures with the Union of German Academies and acadtech have proved successful, and a number of joint position papers have already been published.

How has that expressed itself in the public domain?

One example I could mention is our position paper on pre-implantation diagnosis in 2011. We have it on the word of leading politicians that it was cited in parliamentary discussions. Another important example: after the reactor disaster at Fukushima in the spring of 2011, politicians asked us for a position paper on the energy turnaround. And we actually succeeded in submitting a statement in only six weeks. After that, there were many additional papers; two recently appeared on the topics of plant protection and traumatised refugees.

What still has to be done?

We need to raise our international profile even more in a few areas. There are outstanding collaborative ventures on a bilateral level with other academies and academy networks. Our truly excellent publications would find a wider audience if we produced them in English and distributed them actively in Europe and beyond.

VOLKER TER MEULEN INTERVIEWED
BY LILO BERG



The Independent Group of Scientists of the United Nations met with experts at the Leopoldina Symposium in Berlin. Georg Schütte, Secretary of State at the Federal Ministry of Education and Research, and Jörg Hacker, the President of the Leopoldina, also had an opportunity to exchange views. Fotos: D. Ausserhofer

‘Brain power’ as a key factor in sustainability

Leopoldina Symposium prepares UN development report

On 13 June 2018, the Leopoldina organised the international symposium, ‘Brain Power for Sustainable Development’ in Berlin. At its heart lay the question of how Agenda 2030 and the sustainability goals of the United Nations could be implemented in a targeted and coordinated way.

With the symposium, the Leopoldina was addressing both the public and the international group of experts appointed by the General Secretary of the UN, who are currently preparing the ‘Global Sustainable Development Report 2019’, one of the ‘flagship’ reports of the United Nations. “Many of the decisions we make every day are unsustainable”, as the President of the Leopoldina, Prof. Dr. Jörg Hacker ML, summed up the current situation. At the same time, he underlined the scientific approach adopted by the symposium: “If we wish to achieve global sustainable development which takes equal account of ecological, economic and social factors, then we must understand more clearly the foundations upon which we base our actions, and find concrete ways of enhancing the cognitive skills we require for a successful transformation of sustainability.” That science can also make an important contribution to this was also stressed by Dr. Christophe Eick, Federal Foreign Office Coordinator for Sustainable Development.

The event kicked off with a discussion about what was meant by ‘brain power’ by Prof. Dr. Wolfgang Lutz ML, a Senator of the Leopoldina and member of the UN group of experts, the ‘Independent Group of Scientists’ (IGS), Leopoldina board member Prof. Dr. Frank Rösler ML, Prof. Dr. Sabina Pauen, and Prof. Dr. Ralph Hertwig ML. The experts agreed that cognitive skills, such as those of abstraction, planning and problem-solving, could be developed through interaction with genetic disposition, brain development and social experience, and tweaked and improved in a targeted way. This was particularly feasible in early childhood, but would also be possible at later stages of life.

The close connection between brain power and sustainable development was

then illustrated by scientists from different faculties in relation to the subjects of health, the reduction of poverty, economic development, education, climate change and the environment.

The focus then shifted to the connectivity of the brain power concept to the global discourse on sustainability: inspired by the keynote address of Dr. Georg Schütte, Secretary of State at the Federal Ministry of Education and Research (BMBWF), the members of the IGS – Prof. Dr. Eeva Furman (Finland), Prof. Dr. Eun Mee Kim (Korea) and Dr. David Smith (Jamaica) – held a discussion with the two scientific coordinators of the symposium, Prof. Dr. Wolfgang Lutz ML and Prof. Dr. Frank Rösler ML. It became clear that brain power is a fundamental enabler of sustainable development, and could be one of the key factors in a coordinated implementation of Agenda 2030. In the morning, Prof. Dr. Peter Messerli, co-Chair of the IGS, had already explained the additional steps to be taken before the UN development report could be submitted to the Heads of State and Government of all of the UN member states next year.

Some 120 representatives from the fields of science, society and politics attended the symposium. As the National Academy of Sciences, the Leopoldina promotes dialogue on central issues of sustainability, including within the context of Agenda 2030. (rn, chw)

UN DEVELOPMENT GOALS

Agenda 2030 was adopted by all 193 member states of the United Nations in September 2015. At the heart of the global development agenda lie 17 targets for sustainable development (Sustainable Development Goals, or SDGs), which take account of the three dimensions of sustainability – the environment, the economy and social affairs – and for the first time claim global validity for all states.

■ SUSTAINABLE DEVELOPMENT

G7 Academies focus on global issues

Two position papers on the digital future and the Arctic habitat for the G7 summit in Canada



The G7 Academies introduced two issues for consideration by the Heads of State at the Canadian summit: the transformation of the Arctic as a result of climate change, and the consequences of digitalisation.

Photos: Martin Brechtl and P Fabian Grohs on Unsplash



The National Academies of Sciences of Germany, France, Great Britain, Italy, Japan, Canada and the USA prepared science-based recommendations for this year's G7 summit in La Malbaie, Canada, on Friday 8 and Saturday 9 June. These position papers considered the repercussions of global climate change on the Arctic as a habitat and natural environment, and the consequences of digitalisation for industry and the world of work.

The reports were prepared against a background in which the entire Arctic region is being fundamentally transformed as a result of climate change. This has repercussions for terrestrial and marine ecosystems, and impacts upon the people who live in and depend upon this environment. Meanwhile, digital technologies are responsible for fundamental changes in the economy, education and communication. Both statements by the G7 Academies proposed guidelines for

addressing these issues through change. Considerable importance was also attached to international research cooperation in both areas.

Experts from the Leopoldina played an

G20 POLICY ADVICE IN 2018

Under the leadership of the Argentinian Academy of Sciences, the National Academies of the G20 states are currently drawing up recommendations to improve global food security and for a more sustainable treatment of our soil. The position paper is to be submitted to Argentina's G20 Presidency at the Science20 summit on Tuesday 24 and Wednesday 25 July in Rosario, Argentina. The Science20 process of dialogue was established in 2017 by the German government so that scientists could be more closely involved in the G20 deliberations. The process was coordinated by the Leopoldina.

important role in drafting the statements under the guidance of the Royal Society of Canada. In mid-March, there was a final coordination of recommendations at a meeting of the G7 Academies in Ottawa, Canada. The position papers were presented to the public and politicians at two Science Summits, and discussed in detail: on 26 April a conference on digitalisation was held in Ottawa, and on Wednesday 23 and Thursday 24 May an event was held in Montreal on Arctic-related issues.

Advising the Heads of State and Government of the G7 states is a key strategic element of the Leopoldina's international policy consultation work. Together with the other G7 Academies, it identified scientifically relevant themes to be incorporated in the agenda of the G7 summit and at the same time widen its political focus. (mkk)

■ G7 STATEMENTS

German-African discourse on infectious diseases

Increasing global mobility has facilitated the rapid spread of infectious diseases. This means that there is an urgent need for a cross-border dialogue on their causes and treatment. To this end, the Leopoldina, the Academy of Science of South Africa, and the Uganda National Academy of Sciences organised a symposium in Durban, South Africa, in the middle of April on 'Surveillance and Response to Infectious Diseases and Comorbidities: An African and German Perspective'.

Young researchers from Germany and Africa held a wide-ranging discussion on the latest studies on HIV, tuberculosis, malaria and hepatitis C, and on the development of vaccines. They also talked about the existing possibilities of containing future outbreaks of infectious diseases on the African continent.

Prof. Dr. Stefan H. E. Kaufmann ML (Berlin) coordinated the symposium on behalf of the Leopoldina. Prof. Dr. Thomas Mettenleiter ML (Greifswald-

Riems) and Prof. Dr. Axel Brakhage ML (Jena) led the panel discussion entitled, 'One Health', and delivered keynote lectures.

Prior to the event, the African partners also organised a science policy workshop to introduce the junior researchers present to political consultation in the context of infectious diseases. The next in the series of symposia, which was launched in 2016, will be held in Uganda in 2020. (jn)

Political rapprochement in South East Europe

Convergence, cohesion and cooperation in the Western Balkans are multi-layered processes



The some 80 participants at the 4th Joint Science Conference of the Western Balkans Process met at the Accademia Nazionale dei Lincei in Rome.

Photo: Vittorio Tulli | Consiglio Nazionale delle Ricerche

'The path is the goal: convergence, cohesion and cooperation in South East Europe' – this was the motto of the 4th Joint Science Conference of the Berlin Process held from Wednesday 30 May to Friday 1 June in Rome, Italy. The conference brought together around 80 top representatives of National Academies, Rectors' Conferences, research organisations, transfer and innovation facilities and distinguished scientists from the 14 participating countries of the Berlin Process. It was organised

jointly by the Leopoldina, the Accademia Nazionale dei Lincei, and the Italian National Research Council. In 2018, the UK holds the presidency of the Berlin Process. Poland has now also joined the Process.

The conference focused on three main topics: the subject of 'smart growth' was discussed as a strategic goal for the future. 'Smart growth' stands for economic growth and societal prosperity based in particular on education, research and innovation. A 'West Balkans Action Plan for

Smart Growth' will contain recommendations pooled under the of the European Commission's 'Smart Specialisation Strategy'.

When discussing the topic of 'Convergence and Cohesion', it was pointed out that convergence is not exclusively an economic process, but also has social, institutional and scientific aspects. 'Round tables', led in each case by a Chief Scientific Advisor from the government and a representative for educational and scientific convergence, should assume national responsibility for this. In order to help South East Europe catch up with the EU, special cohesion instruments will still be needed.

In terms of 'Cooperation and Conciliation', it was agreed that dealing with the past is a lengthy process. Education, science and the involvement of the younger generation play a decisive role in this. Possible work strands were sketched out to help make a start towards rapprochement and reconciliation.

The results of the conference in Rome informed preparations for the West Balkans Summit of Heads of State and Government which is to be held on Tuesday 10 July. The next conference will be organised in conjunction with the Royal Society in London, UK, in 2019. (lbb)

■ WESTERN BALKANS PROCESS

Israel Academy and Leopoldina meet to discuss neurosciences

The latest research findings on the functioning of nerve cells, synapses and their interactions in neuron clusters were discussed at the 6th Inter-Academy Symposium of the Leopoldina and the Israel Academy of Sciences and Humanities. The two institutions launched a series of conferences on the neurosciences together in 2008, which have since been held at regular intervals in Israel and Germany.

The 6th symposium in early May was entitled, 'From Synapses to Circuits in Health and Disease', and met with an enthusiastic response from scientific circles in Berlin, attracting an audience of more than 120. Distinguished experts engaged in in-depth discussions with junior research-



Participants from Israel and German came together for a group photo.

Photo: David Ausserhofer

chers; more than twenty young German and Israeli scientists presented posters. The conference also focused on encouraging German-Israeli research cooperation.

The scientific coordinators of the symposium from the Leopoldina were Prof. Dr. Peter Riederer ML, Prof. Dr. Helmut Kettenmann ML, Prof. Dr. Ad Aertsen ML, Prof. Dr. Arthur Konnerth ML, Prof. Dr. Peter Hegemann ML and Prof. Dr. Dietmar Schmitz. Grants were awarded by the German Neuroscience Society to enable young German scientists to attend. The 7th Inter-Academy Symposium will be held in Israel in 2020.

(jn)

Global agriculture in the sights of European academies

InterAcademy Partnership presents its report in Brussels

The European National Academies of Sciences presented their report on 'Food and Nutrition Security and Agriculture' (FNSA) in Brussels towards the end of April. The event was led by Prof. Dr. Volker ter Meulen ML (Würzburg), the former President of the Leopoldina and President of the InterAcademy Partnership (IAP: a



Joachim von Braun, Director of the Centre for Development Research in Bonn, explains the IAP report on food security.

Photo: EASAC

global network of Academies of Sciences), together with Prof. Dr. Joachim von Braun ML (Bonn). After explaining the report, John Bell (representing the Directorate General for Research and Innovation of the European Commission), highlighted areas of intersection with other EU initiatives. Members of the European Parliament and representatives of the Regional Office for Europe and Central Asia of the FAO (the Food and Agricultural Organisation of the United Nations) later joined other experts for a panel discussion.

The report and its presentation to the EU are embedded in the FNSA project funded by the Federal Ministry of Educa-

tion and Research (BMBF), which the IAP has been conducting and the Leopoldina coordinating since 2015. The aim is to develop recommendations on food security and sustainable agriculture for national governments around the world, as well as for the EC, the African Union Commission, and global stakeholders such as the WHO and the FAO. Over the past three years, the regional academy networks of Europe, Africa, America and the Asia-Pacific Region have also been submitting position papers in relation to this. (csd)

■ REPORT FOOD SECURITY

General Meeting of the Global Young Academy

The 8th International Conference and Annual General Meeting of the Global Young Academy took place from 7 to 11 May in Pattaya, Thailand, bringing together 114 GYA members and alumni. The Annual General Meeting (AGM) officially opened on 8 May with a welcome by Leopoldina Secretary General Prof Dr Jutta Schnitzer-Ungefug.

Following the opening, 45 young scholars and scientists (23 female and 22 male) were officially inaugurated, pushing the GYA's gender balance to 57% male and 43% female. The conference addressed the topic 'Forever Young? Sustainable and Healthy Longevity through Science and Technology', with a key-note address by Prof Harald zur Hausen (Heidelberg, Germany) and diverse panels on the individual, social and environmental aspects of sustainability and health.

Throughout the conference, members contributed to the drafting of a conference statement, which will be published in June 2018. At the AGM, the GYA also elected new leadership: 11 new and returning members to the Executive Committee for 2018/19, including Co-Chairs Tolu Oni (UK) and Connie Nshemereirwe (Uganda). (jp)

■ GYA ANNUAL GENERAL MEETING

Some five hundred postdoctoral students received Leopoldina grants

A meeting of former holders of Leopoldina scholarships took place for the eleventh time in late March. They presented the results they had achieved while benefiting from this support. The financial assistance they were given helped the postdoctoral researchers to pursue their own projects at the most distinguished research centres for their particular discipline in another country. After spending two or three years abroad, many have now returned to Germany where they have formed their own working groups or joined new research projects.

When they met in Halle, six scientists presented their current research in-

terests in detail, and provided an insight into topics which are currently occupying scientists – and not just in Germany. For instance, Dr. Clemens Ullmann (Exeter, UK) explained how marine calcite shells can help reconstruct the palaeo-environment. Dr. Stefanie Hautmann (Zurich, Switzerland) talked about the causes and processes of volcanic eruptions, whilst Prof. Dr. Nadja Freund (Bochum, Germany) described her research onto an animal model for bipolar disorder. Prof. Dr. Sabine Becker (Kaiserslautern, Germany) discussed fluorescence sensors for zinc identification in biological media, and Dr. Andreas Eberlein (Ingolstadt, Germany)

talked about the quantum criticality and competing orders in correlated electron systems. Vice President of the Leopoldina Prof. Dr. Gunnar Berg ML chaired the interdisciplinary discussion followed.

Nearly five hundred young researchers have received funding since 2009. This has been made possible by grants from the Federal Ministry of Education and Research and the Saxony-Anhalt Ministry for Economic Affairs, Science and Digitalisation. And the research they have been conducting is clearly paying off: on a long-term average, one fifth of the scholarship holders are being appointed to senior academic positions. (ac)

Antje Boetius wins Communicator Prize

Marine researcher from Bremen awarded for communicating her deep-sea research results

The marine researcher and microbiologist Prof. Dr. Antje Boetius ML, who was appointed Director of the Alfred Wegener Institute in Bremerhaven in 2017, has been awarded the Communicator Prize of the German Research Foundation and the Donors' Association for the Promotion of German Science and Humanities. The honour is in recognition of her dedication to passing on discoveries she has made in the fields of deep-sea and polar research and to answering questions about the academic system and scientific communication. She is to be presented with the prize in Bonn on Monday, 2 July.

Antje Boetius was able to demonstrate the existence of microbial colonies of sulphate-reducing bacteria and of methanotrophic archaea on the ocean floor. These micro-organisms consume the methane which exists in enormous quantities in the oxygen-free environment of the seabed, and thereby ensure that only some of this greenhouse gas – which can be 25 times

as harmful as carbon dioxide – is released into the atmosphere.

The jury emphasised Boetius' self-perception as a scientist for whom the dissemination of research work and discoveries and her commitment to the dialogue between science, politics and society, are all of a piece. Her work as a communicator has three main focal points: The 'Deep-sea adventure' about which she wrote a non-fiction book in 2011, the subject of 'Man and the ocean – the opportunities and risks of global change', on which she has delivered numerous lectures, and science as a career option for women.

Antje Boetius was appointed Professor of Geomicrobiology in 2009. From 2014 she chaired the steering committee of 'Wissenschaft im Dialog' (WiD). She was engaged as the scientific advisor for the scientific film festival 'Silbersalz' (Silver Salt), which is being held in Halle in June this year. The Leopoldina elected Antje Boetius to its Earth Sciences Section in 2009. (ak)



Deep-sea and polar researcher Antje Boetius was presented with the 2018 Communicator Prize of the Donors' Association.

Photo: Alfred-Wegener-Institut / Martin Schiller

Benno Parthier and Volker ter Meulen awarded Orders of Merit

Former Presidents of the Leopoldina honoured for their commitment to science in Saxony-Anhalt

The former Presidents of the Leopoldina, Prof. Dr. Benno Parthier ML and Prof. Dr. Volker ter Meulen ML, were presented with the Order of Merit of the State of Saxony-Anhalt by Prime Minister Dr. Reiner Haseloff on a Friday in early May. This was the state's way of recognising their outstanding service to Saxony-Anhalt as a centre of scientific excellence.

Benno Parthier made a particular contribution to science in Saxony-Anhalt during his time as President of the Leopoldina by preparing the academic society to cope with the completely new challenges facing it as part of the pan-German scientific system. The molecular biologist was a member of the Leopoldina from 1974, and served as its President from 1990 to 2003.



The two former Presidents of the Leopoldina, Benno Parthier and Volker ter Meulen (l to r), were awarded the Order of Merit of the State of Saxony-Anhalt.

Photo: State Chancellery of Saxony-Anhalt/Ines Berger

Volker ter Meulen, Parthier's successor in the office of President, strengthened the Leopoldina's international links with other institutions. As a result, he was partly responsible for the Leopoldina being

designated the National Academy of Sciences in 2008, in consequence of which, Saxony-Anhalt's reputation as a centre of scientific excellence was also enhanced. The virologist and medical researcher Volker ter Meulen joined the Leopoldina as a member in 1984, and was its President from 2003 to 2010. He continues to serve in an advisory capacity on the Board of the National Academy and is an active proponent of cooperation between international Academies of Sciences. The Order of Merit of the State of Saxony-Anhalt is the highest

honour awarded to individuals to whom the state owes an outstanding debt of gratitude. The number of living recipients is limited to 300; it has been awarded 28 times thus far. (ak)

German editors welcomed at Stanford University

‘Dives into Science’ journalism course has been delving into the world of research for five years

The fifth journalism course on ‘Data. The raw material of the future?’ ended with a seminar in Palo Alto, USA, in March. With Prof. Dr. Thomas Südhof ML, a Nobel Prize Laureate in Medicine, at their side, Prof. Dr. Bernd Girod ML and Prof. Dr. Alexander Waibel ML were able to field questions from the 15 copy editors at Stanford University. There were also visits to the Stanford Robotics Lab and the Stanford Linear Accelerator Center. Board member Prof. Dr. Thomas Lengauer ML made a major contribution to the success of the occasion as an expert and advisor.

The issues under discussion ranged from artificial intelligence to virtual and augmented reality, multimodal and multilingual communication, and visualisation in astrophysics. The programme, which included visits to start-ups and new entrepreneurs in Silicon Valley, was rounded off with a discussion session with post-doctoral researchers, who are pursuing projects in San Francisco, Pasadena and San Diego with grants from the Leopoldina.

The ‘Dives into Science’, which have been organised jointly by the Robert Bosch Foundation and the Leopoldina since 2012, concluded with a busy few days in Silicon Valley. The project has seen a total of 75 journalists from trans-regional media receive training in subjects which are equally relevant from a scientific or a social viewpoint.

(dw)



Fifteen journalists found out more about artificial intelligence, robotics and algorithms at the Stanford University.

Photo: Ross Marlowe

World-class standing researcher, teacher, and clinician

Leopoldina mourns the loss of longstanding Vice President, Prof. Dr. Dr. h.c. mult. Otto Braun-Falco

BY PROF. DR. ENNO CHRISTOPHERS ML*

On Monday, 9 April 2018, Prof. Dr. Dr. h.c. mult. Otto Braun-Falco ML, Vice President for Foreign Affairs of the Leopoldina from 1989 to 1995 and Spokesperson of the Dermatology Section from 1982 to 1990, died at the age of 93. During his lifetime, he was a role model, critical observer and inspiring colleague in the world of dermatology, and one of its most prominent figureheads. Enno Braun-Falco led the way in terms of putting new methods into practice, initially in his research into the ultrastructure of the skin, as well as in



Prof. em. Dr. Otto Braun-Falco.

Photo: Leopoldina Archive

the areas of immunohistology, biochemical analysis, the immunopathology of the skin, and early detection of HIV-related problems. His textbook on dermatology and venereology is regarded as a standard work of reference. He lived through a period extending from the revolutionary re-orientation of classical dermatology to the scientific medicine of today.

After graduating in medicine from the University of Mainz in 1948, he submitted his postdoctoral thesis in 1954. In 1960, he was appointed an adjunct professor, and in the following year was offered the Chair in Dermatology and Venereology at the University of Marburg. In 1967 his creative energy resulted in him being called to take up a post at the Ludwig Maximilians University in Munich. He remained the Director of Munich Skin Clinic from 1966 until his retirement in 1991. He was rewarded for his scientific achievements by being offered chairs in Cologne, Vienna and Zurich, all of which he declined.

As a teacher, Otto Braun-Falco passed on his enthusiasm to young doctors; he was full of ideas, inspiring, receptive to new approaches, and able to create a good-humoured environment. The everyday routine of the clinic benefited from his genuine Rhenish conviviality.

He was proud of the many honours bestowed upon him, including the Gold Cothenius Medal of the Deutsche Akademie der Naturforscher Leopoldina in 1997, the Great Federal Cross of Merit, the Bavarian Order of Merit, the Bavarian Order of Maximilian for Science and Art, and the Imperial Japanese Order of the 'Rising Sun with Golden Rays'. From 1999, he served as the Chair of a sponsorship society, the Adolf-Butenandt-Förderkreis.

* Enno Christophers has been a member of the Deutsche Akademie der Naturforscher Leopoldina – now the National Academy of Sciences – since 1985, and was the Director of Kiel University Dermatology Clinic until 2004

Dedicated campaigner for academic freedom

Leopoldina mourns the loss of longstanding Vice President Prof. Dr. Dr. h. c. Gottfried Geiler

BY PROF. DR. PHILIPP U. HEITZ ML*

On Saturday 28 April 2018, Prof. Dr. Dr. h.c. mult. Gottfried Geiler ML, the longstanding Vice President for Medicine of the Leopoldina, died at the age of 90. Gottfried Geiler's academic career was almost entirely associated with Leipzig. It was at the city's university that he trained as a doctor and pathologist, was awarded his doctorate in 1952, and submitted his postdoctoral thesis in 1961. In the same year, he was appointed to a lectureship position. Twenty-one years were to pass before he was appointed an associate professor in 1982.



Prof. em. Dr. Gottfried Geiler.

Photo: Sebastian Willnow / Universität Leipzig

Politically-motivated restrictions notwithstanding, he built up his own group of dedicated staff with whom he discovered the underlying mechanisms of the pathogenesis of rheumatoid arthritis through the use of modern immunopathological methods. He was a professional mentor to his undergraduates, colleagues and doctoral students, and something of a father figure. He also gained international recognition on account of his many scientific works and frequent appearances as a lecturer.

He was elected to the Leopoldina as early as in 1969, appointed to the Board in 1976 as its Medical Secretary, and re-elected on two occasions; in 1989, he was then elected Vice President for Medicine. He held the office until 1999, during what was a momentous period both for him and for the Academy. Thus as Dean of the Medical Faculty, he dedicated himself to structural renewal and personnel reform at the University of Leipzig from 1990 to 1995. He devoted the force of his personality to

advocating for greater academic freedom, and built up new research structures in the post-1989/90 period with a remarkable degree of energy. In recognition of all he had done for the Leopoldina, the latter paid tribute to him in 2002 with its highest award: honorary membership. Thanks to his great emotional intelligence, Gottfried Geiler was admired as a constructive, far-sighted mentor in every echelon of his work.

Professor Geiler found his early election to the Leopoldina – a centre of intellectual freedom, interdisciplinarity and open scientific communication across political and geographical boundaries – truly enriching. It opened up broad international horizons to him, even before 1989.

* Philipp U. Heitz has been a member of the Deutsche Akademie der Naturforscher Leopoldina – now the National Academy of Sciences – since 1989, and was until 2004 the Spokesperson for Pathology and Head of the Pathology Department of the University of Zurich, Switzerland.

People

The cultural and literary scientist **Aleida Assmann ML** and her husband, the Egyptologist Jan Assmann, have been selected as the joint recipients of the Peace Prize of the German Book Trade. Tribute was paid to the couple for the concept of 'cultural memory' which is reflected in the works of both authors. Aleida Assmann, who has been a member of the Leopoldina since 2003, conducts most of her research on the subjects of historical amnesia and the culture of remembrance. The Peace Prize of the German Book Trade is awarded annually during the Frankfurt Book Fair.

Ulla Bonas ML, Professor of Plant Genetics at Martin Luther University, Halle-Wittenberg, and Vice President of the Leopoldina, has been appointed the new Scientific Director of the Alfred Krupp Wissenschaftskolleg in Greifswald. She follows in the footsteps of Bärbel Friedrich ML, who held the post from 2008. As Scientific Director, she will develop objectives and course content for the college's scientific work programmes. Professor Bonas has been a Vice President of the Leopoldina since 2015.

Lorraine J. Daston ML, Director of the Max Planck Institute for the History of Science, has been awarded membership of the division for humanities and social sciences of the Austrian Academy of Sciences. A scientific historian, she conducts research into ideals and practices of rationality, especially within the context of the history of science and ideas in Europe. Her work includes a study of the history of argumentation and the moral authority of nature. She has been a member of the Leopoldina since 2002 in the History of Science and Medicine Section.

Plant biologist **Caroline Dean ML** is to receive the L'Oréal UNESCO For Women in Science Award in honour of her services to research. Caroline Dean studies the mechanisms of seasonal timing in plants. She is particularly interested in the molecular control of flowering time following extended periods of cold temperatures, and how

flowering mechanisms adapt to changing climatic conditions. She has shown that, depending on how cold it is, a conserved chromatin switching mechanism controls the expression of a gene which suppresses flowering. She has been a member of the Organismic and Evolutionary Biology Section of the Leopoldina since 2008.

Computer scientist **Markus Gross ML** was the recipient of the 2018 Distinguished Career Award of the European Association for Computer Graphics (Eurographics). The body awards the prize twice yearly to scientists who have made outstanding technical contributions to the field of computer graphics. The professor at the Swiss Federal Institute of Technology in Zurich established the Computer Graphics Laboratory (CGL) at the Department of Computer Science and has been a Director of Disney Research Zurich (DRZ) since 2008. In 2011, Markus Gross was elected a member of the Leopoldina.

The 2018 Blaise Pascal Medal for Physics has been awarded to **Peter Hänggi ML** for his contribution to our understanding of fluctuations in statistical mechanics, in conditions of thermal equilibrium and non-equilibrium. A professor at the University of Augsburg, he is recognised as the founder of the field of Brownian motors. These are components driven by Brown noise which can be used for directed motion on a micro and nano-scale in combination with non-equilibrium states. Peter Hänggi, who joined the Leopoldina in 2003, is its thirteenth member to win this prize.

Jürgen Jost ML is the winner of the Science Prize of the Teubner Foundation for the Promotion of Mathematical Sciences. As well as teaching as an honorary professor at the University of Leipzig, he is also the Director and a scientific member of the Max Planck Institute for Mathematics in the Sciences in Leipzig. His academic work is mainly in pure mathematics, in particular the connections between geometry and analysis. He links his research into conceptual groundwork with speci-

fic applications in terms of the analysis and modelling of complex systems in the biosciences, cognitive and social sciences. Jürgen Jost has been a member of the Leopoldina since 2002.

Erika Fischer-Lichte ML, theatre scholar at the Free University (FU) in Berlin, has been elected an honorary member of the American Academy of Arts and Sciences. In addition to her activities as a senior professor at the Institute of Theatre Studies at the FU, Erika Fischer-Lichte has been the Director of the 'Interweavings of Theatre Cultures' International Käte Hamburger Centre since 2008. Her work, 'The Aesthetics of the Performative' is regarded as a milestone in theatre studies. Erika Fischer-Lichte has been a member of the Leopoldina since 2011 in the Cultural Sciences Section.

Nicolas Moussiopoulos ML, professor in the Faculty of Mechanical Engineering of Aristotle University in Thessaloniki (Greece), has been elected the Head of Engineering Sciences on the Scientific Council of the Hellenic Foundation for Research and Innovation (HFRI). The HFRI is considered the most important institution for the promotion of research and innovation in Greece. The main fields of research in which Nicolas Moussiopoulos is involved are the development of mathematical models to describe the spread of aerial pollutants in the atmosphere, as well as subjects such as sustainability and the rational utilisation of energy and raw materials. Nicolas Moussiopoulos has been a member of the Leopoldina since 2002.

Rolf Müller ML, the executive director of the Helmholtz Institute for Pharmaceutical Research in Saarland (HIPS) and Head of the Department for 'Microbial Natural Products', has won the 2018 Inhoffen Medal. The prize is presented at the Inhoffen Lecture, an event organised jointly by the Helmholtz Centre for Infection Research (HZI), Braunschweig University of Technology, and the sponsorship society of the HZI. A pharmacist and

natural products researcher, Rolf Müller has conducted research into the development of new antibiotics for use against (multi-resistant) pathogens. For instance, Rolf Müller and his research team have discovered a very promising agent and explained its modus operandi: cyclohexyl griselimycin inhibits the growth of tuberculosis germs and can even fight resistant bacteria. Rolf Müller has been a member of the Leopoldina since 2016.

Ole Petersen ML, Vice President of Academia Europaea – Cardiff Knowledge Hub at Cardiff School of Biosciences in Wales, UK, is the winner of the Walter B. Cannon Award Lectureship. The American Physiological Society (APS) is awarding the prize to Ole Petersen for his outstanding life's work as a physiologist. His research into calcium signal transmission, organelle dysfunction, and acute and chronic pancreatitis has won particular acclaim. Petersen has identified intracellular receptor mechanisms responsible for alcohol-induced pancreatitis. He has also demonstrated how these mechanisms can be suppressed. Ole Petersen has been a member of the Leopoldina since 2010.

Susanne Renner ML, visiting lecturer at the Department of Biology of the University of Missouri in St. Louis, USA, has been elected a member of the American Academy of Arts and Sciences. A specialist in the development of angiosperms, evolutionary biology and biogeography, she conducts research into evolution, biogeography and the taxonomy of flowering plants. Founded in 1780, the Academy of Arts and Sciences is one of the oldest honorary learned societies in the USA. Its areas of interest include projects, academic studies and publications in the fields of the humanities, education and art, global security and energy, science and technology, and social policy. In 2009, Susanne Renner was elected a member of the Leopoldina.

The chemist **Joachim Sauer ML**, professor at Humboldt University, Berlin, has been elected a 'Foreign Member' of the Royal Society, which assumes the role of a national academy of sciences in the UK, for his scientific achievements. Joachim Sauer's research combines quantum chemical ab initio processes with atomistic methods of computer simulation. This can be used to solve problems in the field of

zeolite catalysis. Joachim Sauer was elected to the Leopoldina in 2007.

Günther Schilling ML, for many years a Professor of Crop Physiology and Nutrition at Martin Luther University, Halle-Wittenberg, has been awarded the Order of Merit of the State of Saxony-Anhalt. This is the highest distinction awarded by the federal state, and is presented by its Prime Minister.

Gottfried Schmalz ML has been awarded the title 'Doctor honoris causa' (Dr. h.c.) by Juliu Hatieganu University in Cluj, Romania. His research focuses on verifying the tissue compatibility of dental materials and the development of new materials and test methods so as to reduce the number of animal experiments required. A former director at the Polyclinic for Tooth Preservation and Parodontology of Regensburg University Hospital, he has developed a close working relationship with his peers in the field of dental medicine in Cluj. Gottfried Schmalz was accepted as a member of the Leopoldina in 2006.

Jens Scholz ML, professor at the university hospital in Kiel/Lübeck, Schleswig-Holstein, is the recipient of the Golden Poppy Pin of the Convention of Professors of Anaesthesiology. This is partly in recognition of his research into cardiac contractility. He has also received the 2018 Pioneer Award of the National DRG Forum in Berlin. Jens Scholz is committed to reorganising the German health system for the age of digitalisation, and promotes projects in the fields of big data and robotics. He has been a member of the Leopoldina since 2006.

Peter Schuster ML is the holder of the newly-established Manfred Eigen Award of the Max Planck Institute for Biophysical Chemistry in Göttingen. The award was inaugurated in honour of Manfred Eigen, who won the Nobel Prize for Chemistry and was the founder of the institute. Peter Schuster himself is known for his studies into the theory of molecular evolution. He developed the model of the hypercycle and the quasispecies in close collaboration with Manfred Eigen. Peter Schuster has been a member of the Leopoldina since 1993, where he is in the Biochemistry and Biophysics Section.

Günter M. Ziegler ML, professor at the Free University in Berlin, has been elected as its President. A mathematician, he conducts research into questions related to discrete geometry, in particular the combinatorics of high-dimensional polyhedrons, algebraic and topological methods, and optimisation problems. He also works in the public arena, where he presents mathematics as a diverse and vibrant subject. He has been a member of the Leopoldina since 2009.

Jörg Hacker ML, the President of the Leopoldina, was awarded the citizen's prize, 'The Donkey that Walks on Roses', in Halle (Saale) for his dedication to promoting a knowledge-based society and the general good. The prize is presented by the Mitteldeutsche Zeitung, the neue theater Halle, and the Volksbank Halle, and has been rewarding social engagement since 2003.

New members of Class I

Liane G. Benning ML, German Geo Research Centre, Helmholtz Centre, Potsdam (Earth Sciences Section)

Horst Fischer ML, Dental Materials and Biomaterials Research (ZWBF), RWTH Aachen University Hospital (Engineering Sciences Section)

Dan Frost ML, Bavarian Geoinstitute of the University of Bayreuth (Earth Sciences Section)

Stefan Grimme ML, Institute of Physical and Theoretical Chemistry of the University of Bonn (Chemistry Section)

Gabriele C. Hegerl ML, School of Geosciences, The University of Edinburgh, UK (Earth Sciences Section)

Benjamin List ML, Max Planck Institute for Coal Research, Mülheim an der Ruhr (Chemistry Section)

Manfred Scheer ML, Institute of Inorganic Chemistry of the University of Regensburg (Chemistry Section)

Catharina Stroppel ML, Mathematical Institute of the University of Bonn (Mathematics Section)

Yuri Tschinkel ML, Courant Institute

of Mathematical Sciences, New York University, USA (Mathematics Section)

Viola Vogel ML, Department of Health Sciences and Technology, Institute of Translational Medicine, ETH Zurich, Switzerland (Physics Section)

Gerhard Weikum ML, Max Planck Institute for Computer Sciences, Saarbrücken (Informatics Section)

Thomas Wiegand ML, Fraunhofer Heinrich Hertz Institute, Berlin (Informatics Section)

Deceased members

■ Gustav V.R. Born ML

**29.7.1921 - 16.4.2018 | London, UK
Physiology and Pharmacology/Toxicology**

After researching and teaching at numerous institutions, including the Universities of Oxford and Cambridge in the UK, Gustav V.R. Born accepted a research professorship at the William Harvey Research Institute of St Bartholomew's Hospital Medical College in London in 1989. Gustav Born made extremely important findings during his career in relation to the physiology, pathophysiology and pharmacology of blood platelets, and their importance for haemostasis. He developed a photometric method of measuring and quantifying platelet aggregation. The 'Born aggregometer', a globally recognised research method, has been used in pure research into thrombocytes and played an important role in the verification of aspirin as an aggregation inhibitor. In 2001, Born was awarded the Ernst Jung Gold Medal in Medicine for his body of work. Gustav V.R. Born was elected to the National Academy of Sciences in 1971.

■ Rudolf Cohen ML

**13.6.1932 - 30.4.2018 | Unterhaching
Neurosciences**

After being called to a Chair in the Department of Psychology 1060 at the University of Constance, Rudolf Cohen very quickly established a research hub at the Centre for Psychiatry. His research subjects included mainly psychophysiological examinations of information processing in relation to chronic schizophrenics and behavioural therapy for schizophrenic and alcoholic patients. At the same time,

Cohen demonstrated great commitment to the German Research Foundation, and served as its Vice President 1992 to 1996. Thereafter, until his retirement in 2000, Rudolf Cohen served as the Rector of the University of Constance. He was awarded the Federal Cross of Merit (First Class) for his scientific work and for reorganising the University. He was elected a member of the Leopoldina in 1993.

■ Günter Dörner ML

**13.7.1929 - 30.3.2018 | Berlin
Physiology and Pharmacology/Toxicology**

From 1964 to 1997, Günter Dörner was Professor of Endocrinology and Director of the Institute of Experimental Endocrinology at Humboldt University in Berlin. He conducted research into differences in the brain caused by environmental and hormonal factors, and established a new research field: that of functional teratology. Günter Dörner demonstrated through his work that excessive concentrations of hormones, neurotransmitters and cytokines during critical phases in the development of the brain had the effect of endogenous teratogens and could be the cause of life-long malfunctions or illnesses. In 2002, he was awarded the Great Cross of Merit of the Federal Republic of Germany. Günter Dörner was elected a member of the Leopoldina in 1974.

■ Irenäus Eibl-Eibesfeldt ML

**15.6.1928 - 2.6.2018 | Starnberg
Organismic and Evolutionary Biology**

Irenäus Eibl-Eibesfeldt was Professor of Zoology at Ludwig Maximilians University in Munich from 1969 to 1996, and is regarded as the founder of human ethology. He studied issues related to behavioural development and communication in animals and people. The results of his research in the animal kingdom led to him dedicating himself to the creation of a film documentary which made a cultural comparison of human behaviour, and seeking answers to the question of which types of human behaviour were innate, and which were culturally determined. He also dedicated his life to nature conservation, and worked alongside UNESCO to protect the threatened Galapagos Islands. In 1995, Professor Eibl-Eibesfeldt was awarded the Great Cross of Merit of the Federal Republic of Germany. He was elected a member of the Leopoldina in 1977.

■ Horst Hagedorn ML

**29.10.1933 - 11.5.2018 | Würzburg
Earth Sciences**

After his early forays into research in Göttingen, Berlin and Aachen, Horst Hagedorn accepted the Chair in Geography I at the Geographical Institute of the University of Würzburg in 1971. His research work focused primarily on environmental and climatic conditions in arid regions, and the way in which they develop. His research took him to the central Sahara on multiple occasions. In Libya and Chad, Horst Hagedorn learned much about aeolian formation, namely how the surface of the land changes under the influence of the wind. As well as being committed to research and teaching, he was also involved in academic and higher education policy matters: for instance, he was Dean of the Faculty, a member of the Senate, and – from 1994 to 2000 – Vice President of the University of Würzburg. Horst Hagedorn won many awards for his services, including the Order of Merit of the Federal Republic of Germany with ribbon (First Class) and the Albrecht Penck Medal of the German Quaternary Association. Horst Hagedorn became a member of the Leopoldina in 1993.

■ Elisa Izaurralde ML

**20.9.1959 - 30.4.2018 | Tübingen
Genetics/Molecular Biology and Cell Biology**

Elisa Izaurralde was Director of the Department of Biochemistry at the Max Planck Institute for Developmental Biology in Tübingen from 2005, where she conducted research into mechanisms of gene expression and cellular transport routes. Her research led to the discovery of a new route for the exportation of RNA complexes from the cell nucleus, and she was able to describe crucial mechanisms of RNA metabolic processes. In 2008, she was declared the joint winner of the Gottfried Wilhelm Leibniz Prize of the German Research Foundation with Elena Conti ML, Director of Cellular Structural Biology at the Max Planck Institute in Munich, for her work on mRNA degradation. Elisa Izaurralde was elected a member of the Leopoldina in 2009.

■ Otto Kandler ML

**23.10.1920 - 29.8.2017 | Munich
Organismic and Evolutionary Biology**

Otto Kandler was Professor of General Bo-

tany at the Ludwig Maximilians University in Munich from 1968 until he retired in 1986. He made important scientific contributions to our understanding of plant photosynthesis, discovered fundamental chemical differences in the cell walls of bacteria and archaea, and – together with Carl Woese ML – established the classification of organisms in the three domains of archaea, bacteria and eukaryotes. Otto Kandler also studied the microbiology of milk and how to generate biogas from sewage and refuse. In 1992, he was awarded the Federal Cross of Merit (First Class). Otto Kandler was elected a member of the Leopoldina in 1971.

■ Josef Knoll ML

30.5.1925 - 17.4.2018 | Budapest, Hungary

Physiology and Pharmacology/Toxicology

Josef Knoll was a professor and, from 1962, Director of Pharmacology at Semmelweis University in Budapest, Hungary. His main area of research was psychopharmacology. His works on analysing how tranquilisers worked, in particular reserpine, as well as psychostimulants and phenethylamine, were of particular interest to his peers. His results led to the synthesis of a number of pharmaceuticals for therapeutic use. From 1967 to 1983 he was the President of the Hungarian Pharmacological Society. In 1985 he was awarded the Hungarian national prize, the Issekutz Prize. Josef Knoll was elected a member of the Leopoldina in 1974.

■ Baldev Raj ML

9.4.1947 - 6.1.2018 | Pune, India
Physics

Baldev Raj held the post of Executive Director at the Indira Gandhi Centre for Atomic Research (IGCAR) between 2004 and 2011. The physicist's work in the field of nuclear research delivered important findings on the non-destructive early detection of fatigue and oxidation processes which are of vital importance to the safety of reactors. In 2007, Baldev Raj received the Padma Shri Award, one of the highest civilian decorations in the gift of the Indian government. Baldev Raj was elected a member of the Leopoldina in 2008.

■ Klaus Riegel ML

14.5.1926 - 4.6.2018 | Munich
Paediatrics

Klaus Riegel was a former senior physician at Tübingen University Hospital (1965-67) and a senior physician at the paediatric clinic and polyclinic of Ludwig Maximilians University in Munich (1967-72). He specialised in the fields of perinatal respiration and respiration in infancy. From 1972 until his retirement in 1991, he was the Head of the Neonatology Department in Munich. Klaus Riegel specialised there in acid-base metabolism and quality assurance in perinatal and neonatal medicine. He was awarded the Federal Cross of Merit with ribbon in 1993 for his services to research. He became a member of the Leopoldina in 1984.

■ Jens Christian Skou ML

8.10.1918 - 28.5.2018 | Risskov, Denmark

Biochemistry and Biophysics

The Danish biophysicist Jens Christian Skou centred his research around the molecule adenosine triphosphate (ATP), which is extremely important for energy transfer in cells. The former Professor of Physiology at the University of Aarhus discovered the transport enzyme sodium-potassium ATPase (Na⁺/K⁺-ATPase), which transports substances through the cell membrane and thereby consumes ATP. This mechanism is important for maintaining cell volume, and plays a role in controlling the heartbeat. Defects in the sodium-potassium pump might be a possible cause of epilepsy. In 1997 he was awarded the Nobel Prize for Chemistry jointly with John Ernest Walker and Paul Delos Boyer for his contributions to the study of adenosine triphosphate (ATP). He was accepted as a member of the Leopoldina in 1977.

■ Charles Yanofsky ML

17.4. 1925 - 16.3.2018 | Stanford, USA

Genetics/Molecular Biology and Cell Biology

Charles Yanofsky took up a post as Professor of Biology at Stanford University, USA, in 1958, where he taught and carried out research for more than fifty years. He made discoveries on the relationships bet-

ween the structures of genes and proteins, discovered intermediate products of tryptophan biosynthesis, and identified the enzymes involved and the enzyme-coding genes. His research also increased our understanding of the genetic code, alterations to genetic material through mutation and attenuation, and a mechanism to regulate gene expression. In 2003, Yanofsky was awarded the National Medal of Science. This is presented annually by the President of the United States of America to up to twenty outstanding scientists. Charles Yanofsky became a member of the Leopoldina in 1976.

Leopoldina fellowship programme

New research fellows

Dr. Michael Kaminski from the Clinic for Internal Medicine IV, Nephrology and General Medicine, at Freiburg University Hospital is to spend 24 months at the Institute for Medical Engineering and Science in the Department of Biological Engineering of the Massachusetts Institute of Technology in Cambridge, USA. He will join the working group led by Prof. James J. Collins.

Dr. Eslam Khalaf from the Max Planck Institute for Solid State Research in Stuttgart plans to continue his research at the Department of Physics of Harvard University in Cambridge/MA, USA, under Prof. Ashvin Vishwanath.

Dr. Katharina Schmack from the Visual Perception Laboratory of the Clinic for Psychiatry and Psychotherapy of the Charité in Berlin has chosen to pursue her project at the Cold Spring Harbor Laboratory in New York, USA, where she will transfer to the research group led by Adam Kepecs PhD.

Leopoldina employees

Dr. Simon Rebohm has been working as a research associate in the Study Centre of the Leopoldina since June.



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