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Editorial

Dear members and friends
of the Leopoldina,



Health is a precious commodity. The role of public health, nationwide healthcare, preventive health services and disease prevention

is to help all members of society maintain their health as best as possible. In recent years enormous achievements have been made in this field, such as the fight against AIDS, protection for non-smokers and the discovery of the causes of cardiovascular disease. Nonetheless, Germany has yet to realise its full potential in the sphere of public health. And in view of the huge challenges we are facing, a greater commitment should also be made to global health in the international arena.

To call attention to the future prospects of public health, the Leopoldina, acatech, and the Union of the German Academies have prepared and published the statement entitled "Public Health in Germany – Structures, Developments and Global Challenges" (see next item). It provides a starting point for a public debate on the many various aspects of healthcare that relate not only to medicine, but also to the social services, education and business sectors plus many other areas of society.

The subject is not an easy one to convey. This is partly due to its broad scope, but also because of a lack of a public health tradition in Germany. Yet I am optimistic that the academies' statement will serve to familiarise the public with the concept and deepen the understanding of the challenges involved in public health. We wish you a thought-provoking read!

Jörg Hacker



The statement on public health is presented to members of parliament in Berlin. From left: Working group spokesperson Detlev Ganten, Vice President of the German Bundestag Edelgard Bulmahn, and Leopoldina President Jörg Hacker.

photo: David Ausserhofer

Public Health in Germany

Statement on nationwide healthcare and disease prevention is presented in Berlin

Public health involves the science and practice of disease prevention, the increase of life expectancy, and the promotion of healthcare in general using comprehensive, structured measures at every level of society. On 16 June, the "Public Health in Germany – Structures, Developments and Global Challenges" statement was published. Prof. Detlev Ganten ML and his working group compiled this report together with international colleagues over one-and-a-half years. It was presented to the press and Members of the German Bundestag.

Public health is an integrative science; research findings are applied as practical measures to benefit the health of the population. This is why it is not only national strategies that are needed, but also cooperation in a European and global context.

Public health work requires cross-sector activities and engagement at every level of society. Whilst there are highly effective people and institutions working in the field, the academic structures in

research and teaching are fragmented. In spite of ongoing efforts and progress, these structures are not always aligned with national requirements and international standards. Public health research in Germany demands greater political support, better structures and more investment.

Strengthening public health at national level is closely linked with overcoming challenges faced in global health. Germany is in a position to be more engaged internationally – especially in areas where it has a wealth of experience, such as research, innovation, universal access to healthcare, and social security.

The statement outlines the public health objectives that Germany should be pursuing, as well as the academic structures that would facilitate these. It stipulates which structures are required in German health institutions in order to improve research, education, policymaking, and public awareness. (kh)

■ THE PAPER CAN BE FOUND HERE

Symmetry and asymmetry in science and art

The Leopoldina 2015 Annual Assembly in Halle (Saale): Chancellor Angela Merkel among the guests

Federal Chancellor Angela Merkel and Minister-President of Saxony-Anhalt Reiner Haseloff will be topping the guest list on the first day of the Leopoldina's 2015 Annual Assembly on 18 September. The event will take place at the Academy's headquarters in Halle (Saale). The members and guests can expect a special slant to the programme this year: the sessions will be structured in a way that reflects the diverse range of the Leopoldina's specialisms and will integrate various Classes and Sections.

This approach was chosen to match the nature of this year's "symmetry and asymmetry in science and art" theme, which has a particularly broad and deep significance that cuts across many scientific disciplines. We can encounter symmetries in almost all areas of human culture as they play an equally important role in the natural sciences, mathematics, art, music, technology, architecture, the humanities and cultural history.

In physics, for example, symmetries are linked to the conservation laws of energy and momentum. In chemistry, symmetries abound in spectroscopy and the structural theory of molecules and crystals. In biology, the evolution of molecular homochirality is just one example and, in medicine, the mirror symmetry of the human body is plain to see. From an epistemological perspective, the detection of symmetry violations in nature is essential because they make fundamentally non-observable quantities in symmetrical systems visible.

The choice of "symmetry and asymmetry" as this year's topic thus gives various fields of science and representatives from different Sections the chance to contribute to the event. "This year's theme not only gives researchers the opportunity to find out about the role of symmetries in other disciplines, it can also serve as a source of inspiration for their own discipline," explains Prof. Gunnar Berg, Vice President of the Leopoldina. The event should also provide an excellent opportunity for members from different Sections to meet and exchange ideas during the various sessions.

For this reason, this year's Annual As-



The conference's wide-ranging programme includes a lecture by Prof. Peter Jenni ML, who will speak about the long journey to the Higgs boson at CERN's Large Hadron Collider. photo: generalfm - fotolia.com

sembly was scientifically coordinated by a team of members from all Classes and Sections. The topic was proposed by Prof. Martin Quack ML, head of the "Molecular kinetics and spectroscopy" research group at ETH Zurich.

In his opinion, all lectures are equally to be recommended. Already on the Friday, a rich and varied range of events will be on the agenda: Angela Merkel's official speech will be followed by a keynote speech on "symmetry breaking in morality" by Prof. Dieter Birnbacher ML on the basic principles of our actions, followed by an evening lecture by Prof. Günther Hasinger ML, who will be asking: "Is the sky symmetrical?"

The connections between science and art will also become apparent in the Young

Academy's workshop on the Saturday, which will include contributions on choreography, mathematics and music theory. To round off the event, Prof. Andreas Kablitz ML and Prof. Anna Wienhard, alumni of the Young Academy, and Nobel laureate Prof. Daniel Shechtman will once more illustrate the overarching nature of the topic: the cultural scientist will talk about "symmetry as a structural principle of thought in the modern day", the mathematician will address "geometry through symmetry" and the physicist will focus on "Quasi-periodic materials – a paradigm shift in crystallography". (dw)

■ FURTHER INFORMATION CAN BE FOUND HERE

PRIZES AND MEDALS

On Friday 18 September, the following prizes and medals will be awarded on the occasion of the opening ceremony of the 2015 Annual Assembly: the Cothenius Medals for outstanding lifetime achievements in science, the Carus Medals for important scientific achievements, the Schleiden Medal, and the Mendel Medal. In addition, the Leopoldina will present its own Thieme Award for Medicine and the Leopoldina Prizes for Junior Scientists, as well as the Georg Uschmann Award for the History of Science.

“Detect, understand, heal?”

Leopoldina Lecture on the subject of optogenetics, and Class III symposium for medicine

Optogenetics is the science of using light to trace and control processes in the brain. In his Leopoldina Lecture on the evening of 8 July, Prof. Karl Deisseroth ML (Stanford University, US) presented the optogenetic method that he largely developed himself: CLARITY. This method makes the individual structures and brain activity during different behavioural patterns visible in the brains of mice. This means that researchers can identify which cells are activated in a state of fear, for example. It represents a critical development in understanding the functionality and interaction between different areas of the brain, and should help us recognise the mechanisms of depression and other illnesses.

In the class symposium the next day, Prof. Gesine Hansen ML (Hannover), Prof. Claus Bachert ML (Ghent), Prof. Jutta Gärtner ML (Göttingen), Prof. Jose-Alain Sahel ML (Paris), Prof. Heidrun Potschka ML (Munich) and Prof. Marion Kiechle ML (Munich) gave presentations on their current research projects under the title “Detect, understand, heal?” One focus of the symposium was prevention. This topic was addressed by Gesine Hansen in her presentation on preventing and treating allergies, as well as by Marion Kiechle in her paper on the prevention and treatment of hereditary breast and ovarian cancer.

Early contact with allergens reduces the risk of allergies and asthma

Gesine Hansen spoke about research on asthma, which is the most common chronic illness affecting children in Germany. Environmental factors are critical in causing the high number of sufferers. Hansen’s research suggests that the behaviour of mothers is significant, since a child’s immune system is influenced during and directly following the birth, as well as in the uterus. Mothers should avoid risk factors such as smoking and obesity before the pregnancy. Caesarean sections also increase the chances that a baby will suffer from asthma by at least 20 percent.

Possible allergens should however not be avoided. In fact, the opposite is true: the risk of allergies and asthma is reduced

New members of Class III



The new members of Class III are presented with their membership certificates: From left: Prof. Heidrun Potschka (Munich), Prof. Bernd Walter Böttiger (Cologne), Prof. Frank Bradke (Bonn), Prof. Ulrich Gembruch (Bonn), Leopoldina Secretary-General Prof. Jutta Schnitzer-Ungefug (Halle), Prof. Marion Kiechle (Munich), Prof. Reinhard Hickel (Munich), Leopoldina President Prof. Jörg Hacker (Halle), Prof. Maria Teschler-Nicola (Vienna, Austria), Prof. Darius Moradpour (Lausanne, Switzerland), Prof. Jutta Gärtner (Göttingen), Prof. Karl Deisseroth (Stanford, USA), Prof. Andreas Neubauer (Marburg), Prof. Erwin Tschachler (Vienna, Austria), Prof. José Alain Sahel (Paris, France), Prof. Claus Bachert (Ghent, Belgium), Class III spokesperson Prof. Hans Konrad Müller-Hermelink (Würzburg).

Foto: M. Scholz

if a mother exposes her embryo and child to allergens at an early stage. Early contact allows the child to develop a tolerance that prevents the immune system from overreacting to allergens at a later stage. The population of bacteria in a person’s body also plays a role in this process – the so-called “microbiome”. In summary, whilst mothers should avoid risk factors, they should come into contact with potential allergens. This builds a tolerance in their child’s immune system.

In her presentation, Marion Kiechle from Munich explained how external factors also influence the chances of developing cancer. She focuses on breast cancer, which is the most common type of cancer affecting women in Germany. The latest research conducted by Kiechle shows that a selective and systematic change of lifestyle can reduce the risk of developing

breast cancer by 50 percent. Even men and women who are genetically predisposed to an illness can significantly reduce the risk through healthy nutrition, by consuming less fat and eating more fruit, vegetables and whole-grain products.

Consortium for treating breast and ovarian cancer

Over the past few years, Kiechle has established a consortium of hospitals that offer special consultation hours, and which look to apply research findings in treatment. The common goals are to coordinate activities for improving the treatment of breast and ovarian cancer, to research new treatment methods, and, if possible, to prevent outbreaks of cancer through targeted prevention strategies.

(hst)

Environment and Health symposium

Experts from Africa and Germany address the consequences of environmental pollution

Cyclists riding around the busy streets of a Chinese metropolis wearing face masks have become representative of an unavoidable fact of modern life: in many countries, more and more people have to face the impact of environmental factors on their health. This was the issue addressed by the Academy of Science of South Africa, the Ethiopian Academy of Sciences, the Ghana Academy of Arts and Sciences and the Leopoldina in the Environment and Health symposium.

The event was co-organised by Prof. Jean Krutmann ML, Düsseldorf, and took place from 1 to 3 June 2015 in Pretoria, South Africa. Scientists from sub-Saharan Africa and Germany and numerous local guests held lectures and round table talks to discuss the effects on human health brought about by air and water pollution, UV radiation and metal exposure.

The evening keynote given by Prof. Jacqueline McGlade, Chief Scientist of the United Nations Environment Programme, was one of the highlights of the symposium. The UN representative spoke on



Researchers from South Africa and Germany met in Pretoria to discuss the consequences of environmental pollution on human health.

photo: ASSAF

“Outlooks for a healthy planet and human well-being“.

In addition, 22 young scientists from Germany and various African countries presented their current research activities

in the field of environment and health in poster sessions and discussed them with the participants. The Volkswagen Foundation provided substantial funding for the event. (jn)

Brain structures and functions

2nd German-Turkish Science Dialogue held in Bochum

Why are we the way we are? In a bid to find answers to this question, researchers around the world are studying the architecture of the brain. New findings are leading to exciting conjectures on the evolution of the brain and the formation of complex thought. These were discussed in the 2nd German-Turkish Science Dialogue, which took place on 16 June at the Ruhr-Universität Bochum.

The human brain is the most complex living structure in the known universe. It can store more information than any current supercomputer and has the capacity to form thoughts, ideas, hopes, dreams and fantasies. It is our brain that makes us human. And it is not just brain researchers who are pursuing the holy grail of deciphering neural control mechanisms and functions. Thanks to the combined efforts of researchers from various fields,

enormous progress has been made over the past two decades, enabling even complex issues to be investigated in detail, yet the journey to truly understanding the human brain research has only just begun.

The further development of neuroscience cannot be just a national endeavour; it depends on a free exchange of ideas across national borders. The symposium was prepared and moderated by Prof. Onur Güntürkün ML of Ruhr-Universität Bochum. Renowned neuroscientists including Prof. Nikos Logothetis ML (Max Planck Institute for Biological Cybernetics, Tübingen), Prof. Fuat Balci (Koç University, Istanbul), Prof. Huseyin Boyacı (Bilkent University, Ankara), Prof. Tamer Demiralp (Istanbul University) and Prof. Ricarda Schubotz (WWU Münster) presented their research findings.

(lb)

Leopoldina Human Rights Committee meets in Bern

The Leopoldina Human Rights Committee (HRC) regularly organises the “Human Rights and Science” symposium to discuss cases of oppression and human rights violations in the field of science.

This year, the event was co-hosted for the first time by the HRC and the Swiss Academies of Arts and Sciences. Under the title “The Human Right to Science: New Directions for Human Rights in Science”, scientists from various European countries and representatives from the spheres of politics and society met in Bern on 22 May to discuss the global protection and enforcement of human rights in science. A special focus of the event was international seed policy. The next HRC “Human Rights and Science” symposium will take place in Slovenia in autumn 2016. (jn)

Young Academy: new members - international guests

Awards for winners of the first European prize question at this year's ceremony

At this year's ceremony held on 6 June, the Young Academy in Berlin welcomed ten new members and, together with other European Young Academies, awarded prizes for the best answers to the prize question "Who Gets Carried Away by Europe?".

As member of the advisory board for the Commerzbank Foundation, laudator Prof. Jan-Hendrik Olbertz presented a total of five awards to the competition winners, which an international jury had selected from a shortlist of the best entries. The competition included entries from 17 countries.

Dr Chris Thomale and Prof. Jule Specht warmly invited the new members to take part in the Young Academy's interdisciplinary dialogue and its work at the interface between research and society. Ten outstanding young scientists from various disciplines have been appointed.

(av)



New presidium and new spokesperson: The newly elected presidium of the Young Academy (left to right): Lawyer Dr Emanuel V. Towfigh, immunologist Dr Angelika Riemer, musicologist and composer Dr Gordon Kampe, who is also the new spokesperson, political scientist and media studies researcher Dr Evelyn Runge, and lawyer Dr Florian Meinel.

photo: David Ausserhofer/Junge Akademie

Cross-border energy policy

German and French academies present statement

In early summer last year, four academies – the Leopoldina, acatech, the Académie des sciences and the Académie des technologies – launched the Franco-German "Round Table on Energy Transition". Over the course of several workshops, German scientists and experts from the energy industry drafted a joint statement. This statement was presented in Paris on 10 July on the sidelines of a UN scientific conference ahead of the COP21 UN Climate Change Conference in December 2015.

In the statement, the academies advocate a closer partnership between Germany and France in the areas of energy research and policy. They point out that in spite of

their different national approaches to the energy transition, the countries face common challenges and could thus benefit from closer cooperation.

Potential areas of collaboration include energy efficiency, electricity grids, mobility, renewable energies, energy storage, fusion, and the safety and disposal of nuclear waste. The statement also emphasises the significance of social aspects, which are sometimes neglected in the context of the energy transition. It also calls for a systemic approach to the issue and an energy policy that cuts across national borders.

(rn)

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EASAC General Assembly

The biannual general assembly of the European Academies Science Advisory Council (EASAC) took place at the Royal Netherlands Academy of Arts and Sciences (KNAW) in Amsterdam on 21 and 22 May. In the course of the meeting, whose main topic was the EASAC work programme, the representatives of the member academies had the chance to talk to Director-General of the European Commission's Joint Research Centre (JRC) Vladimír Šucha.

Šucha took part in the event with a view to establishing a stronger connection between the two organisations. A Dutch government representative and the newly elected KNAW president, Prof. José van Dijk, also attended the event.

(csd)

People

Deceased Members

■ Johannes Heydenreich

20 June 1930 – 24 June 2015 | Halle (Saale)

Physics

Physicist Johannes Heydenreich conducted research in the field of electron microscopy. By interpreting electron-optical images, he gained new insights into the surface structure of a diverse range of materials. Heydenreich, who was elected a member of the Leopoldina in 1986, also researched faults in semiconductors.

■ Heinrich Nöth

20 June 1928 – 26 June 2015 | Munich

Chemistry

Munich-born chemist Heinrich Nöth researched the structures and bonding properties of hydrogen, boron, phosphorous and aluminium. His investigations into these main-group elements were mostly based on X-ray structure analysis and nuclear magnetic resonance spectroscopy. Both in terms of his research findings and in his work as president of the German Chemical Society, he rendered outstanding services to chemical research in Germany.



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Jägerberg 1
D-06108 Halle (Saale)
Telefon: +49-345/4 72 39 – 800
Telefax: +49-345/4 72 39 – 809
presse@leopoldina.org

Editing:

Caroline Wichmann (cw)
Julia Klabuhn (jk)
Daniela Weber (dw)

Other Editors:

Prof. Dr. Jutta Schnitzer-Ungefug (jsu) (responsible according to the German press law)
Prof. Dr. Dr. Gunnar Berg ML (gb)
Hannes Junker (ju)

Other authors in this issue:

Dr. Christian Anton, Scientific Officer, Department Science - Policy - Society (ca)
Lucian Brujan, Senior Officer, Department International Relations (lb)
Dr. Christiane Diehl, Deputy Head International

Relations Department; Executive Director, EASAC Secretariat (csd)

Prof. Dr. Rainer Godel, Project Director, Centre for Science Studies (rgo)

Anna-Maria Gramatté, IAP Project Assistant, Department International Relations (amg)

Dr. Kathrin Happe, Scientific officer, Deputy Head of Department Science – Policy – Society (kh)

Annegret Kuhnigk, NASAC and IAP Project Assistant (ak)

Dr. Ruth Narmann, Deputy Head International Relations Department (rn)

Dr. Jan Nissen, Senior Officer, Department International Relations (jn)

Dr. Henning Steinicke, Scientific Officer, Department Science – Policy – Society (hst)

Angelika Winnen, Young Academie (aw)

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Abbreviations:

ML = Member of the Leopoldina