



Leopoldina
Nationale Akademie
der Wissenschaften

Leopoldina news

2/2016

Deutsche Akademie der Naturforscher Leopoldina –
German National Academy of Sciences

Halle, 7 April 2016

Tracking down memory



Interview with Nobel laureate Eric Kandel ML
about prions, the Aplysia sea slug and more
Lecture on 27 May in Berlin

SOCIETY

P 2



How much outside help
do we need?
Leopoldina Discussion on
immigration

COMMUNICATION

P 4



What modern farming
has to accomplish
Participants in seminar
programme report back

INTERNATIONAL ISSUES

P 5



„Brain and Eye“
symposium
Neuroscientists meet in
India

Editorial

Dear members and friends
of the Leopoldina,



the Leopoldina has a long history; it is one of the oldest academies of science in the world. With such a prominent past comes an obligation to cast light on the various historical epochs that the institution has passed through and to critically assess the activities of its leaders and members. In particular, the Leopoldina bears a great responsibility to address recent history.

An important contribution to this reappraisal of the past was published in late February by academic publisher be.bra – the monograph „Die Leopoldina: Die Deutsche Akademie der Naturforscher zwischen Kaiserreich und früher DDR“ about the institute’s history from the final years of the German Empire to the early years of the GDR. Authors Rüdiger vom Bruch, Sibylle Gerstengarbe and Jens Thiel provide a nuanced overview of the Academy’s activities during the first half of the 20th century.

I would like to express my heartfelt gratitude to Dr vom Bruch’s project team at Humboldt-Universität zu Berlin, which was funded by the Alfred Krupp von Bohlen and Halbach Foundation. Thanks are also due to the academic advisory council that supported the project, in particular medical historian Prof. Wolfgang U. Eckart ML.

This publication is just one step in the process of reappraising the Leopoldina’s history. In late May the monograph will be discussed in a workshop run by the Leopoldina. The event will also present other research projects that address the Academy’s recent past. I hope that the event will generate a high level of interest and inspire fruitful debate.

I wish you a thought-provoking read.

Rüdiger vom Bruch

Could immigrants help soften the impact of demographic change?

The Leopoldina and the Halle Institute for Economic Research host a panel discussion on immigration



Participants in the panel discussion were (from left): Prof. Josef Ehmer, University of Vienna, Prof. Christine Langenfeld, Chairwoman of the Expert Council of German Foundations on Integration and Migration, moderator Dorothea Siems of Die Welt newspaper, Prof. Norbert F. Schneider, Director of the Federal Institute of Population Research, Prof. Klaus F. Zimmermann, Director of the Institute for the Study of Labor, Prof. Barbara John of the Paritätische, and Prof. Reint E. Gropp, Ph.D., President of Halle Institute for Economic Research.

photo: Markus Scholz

Over the coming decades, it is extremely likely that Germany’s population will decrease and its average age increase. This situation will give rise to a number of socio-political challenges and opportunities, all brought together under the term “demographic change”. At the same time, the number of immigrants and asylum seekers arriving in Germany is rising. At times, hope is expressed that these new immigrants will be able to help German society overcome the economic challenges that demographic change poses. Whether this hope is justified and, if so, what conditions must be met for immigration to have a positive effect, was the topic of a panel discussion held on 3 March at the Leopoldina in Halle. The event brought together experts in the fields of demography, economics, law and history and attracted an audience of around 200.

Improving education and training opportunities for immigrants

The discussion organised by the Leopoldina and the Halle Institute for Economic Research (IWH) concluded that the integration of immigrants arriving in

Germany is a long-term task that should be addressed as soon as possible – as to avoid repeating mistakes that have been made previously with regard to immigration.

Differentiating between types of immigration

Particularly as regards the highly important areas of education and training, an adequate infrastructure needs to be put in place as soon as possible. Participants in the panel discussion believe such an infrastructure is currently lacking. During the discussion a suggestion was also made to officially recognise partial qualifications – for example, in cases where immigrants already possess the practical skills required for a job.

The reception of asylum seekers for humanitarian reasons is one area; the controlled immigration of qualified workers is quite another. As some of the experts repeatedly pointed out, this could be another important strategy in dealing with the looming shortage of skilled workers.

(sw)

No plans to retire

Interview with Nobel laureate Eric Kandel / lecture on 27 May in Berlin

The 86-year-old Prof. Eric Kandel ML is one of the leading neuroscientists in the world. He co-hosts a television show on brain research and goes in to work at his New York laboratory almost every day. In May, the Nobel laureate comes to Berlin to give a Leopoldina Lecture on his latest findings about memory. Science journalist Lilo Berg caught up with Kandel prior to the lecture.

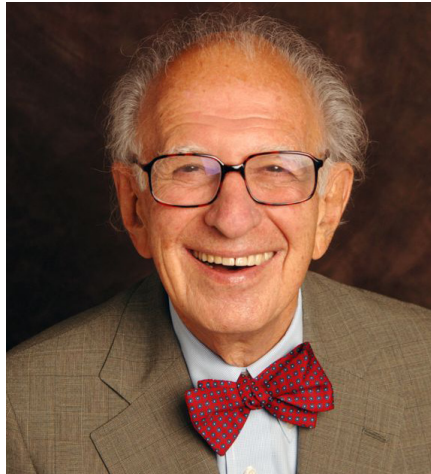
In Berlin you will be speaking about the importance of functional prion-like proteins in the persistence of memory. Is your lecture aimed only at specialists?

Kandel: Absolutely not – anyone with an interest in the topic can come along. I would actually have preferred to talk about something more for a general audience such as my recent book on art and science for example. But my hosts wanted me to give a lecture on my current research on the persistence of memory.

How do you explain this research to non-scientists?

Kandel: I've been studying proteins – known as prions – for around 15 years now. These prions can form aggregates that transmit diseases of the brain including Creutzfeldt-Jakob disease and Alzheimer's disease. However, my laboratory studies have discovered that not all prion variants are harmful. There appear to be a class of prion-like proteins that we call "functional prions". The class of functional prions we have been studying has a normal function in maintaining long-term storage of memories.

These findings have been published in journals in recent years. Will your talk in Berlin also cover some as yet unpublished



Eric Kandel photo: © Eve Vagg, Columbia University

discoveries?

Kandel: Yes. For example, I will be talking about a newly discovered prion variant named TIA. This molecule is also beneficial in that it absorbs psychological stress when the levels get too high. However, in our experiments they only displayed this protective function in female test animals. We have a few ideas about this, which I will explain in my talk.

In the year 2000, you received the Nobel Prize in Physiology or Medicine for your research into the function of memory. At the same time, you conducted your first experiments with prions. What made you decide to take this direction?

Kandel: I received the Nobel Prize for providing evidence that memories are stored in the connections between neurons known as synapses – and that memory storage leads to a change in the strength of synapses. To store short-term memories, neurons modify pre-existing proteins and produce functional changes in the way that neurons communicate with one

another. With the storage of long-term memories, the number of synaptic connections actually increases and certain proteins have to be synthesized anew. In my lab, we are interested in exactly what happens when long-term memories are created – this is how we came across the beneficial functional prions. We have already deciphered some of the properties of these functional prions, but there is still much to learn.

You are now 86 years old. What are you still hoping to achieve?

Kandel: I have a full life behind me; I don't need to achieve anything else. But I take great pleasure from the fact that I can still conduct research in my own laboratory. I go to the university almost every working day. I have a lot of pleasure doing a TV show, The Charlie Rose: Brain Series, of which I am the co-host. I am also in no rush to stop writing; I am currently working on an essay about the world-renowned Prinzhorn Collection at Heidelberg's University Hospital, which exhibits artworks by psychiatric patients.

How do you manage all of this?

Kandel: I try to stay active, both mentally and physically. The best way to keep your memory fit is through learning – and there is no age limit to learning. I try to swim most days, I play tennis, and I go on long walks at the weekend.

And you never dream of retirement?

Kandel: No. Retirement is poison and the statutory retirement age is nonsense – Germany should abolish it.

■ LONG VERSION OF THE INTERVIEW

LEOPOLDINA-LECTURE WITH NOBEL LAUREATE ERIC KANDEL

Neuroscientist Eric Richard Kandel was born on 7 November 1929 in Vienna. In 1939, he and his family emigrated to the United States. Kandel studied medicine in New York with the intention of becoming a psychiatrist and psychoanalyst, but ended up turning his attentions instead to experimental research, predominantly on the sea slug *Aplysia californica*. He has been a professor in the Departments of Physiology and Psychiatry at Columbia University in New York since 1974. In 2000, Kandel received the Nobel Prize in Physiology or Medicine along with Swede Arvid Carlsson and American Paul Greengard, for their discoveries concerning signal transduction in the nervous system. Kandel has been a Member of the Leopoldina since 1989.

On Friday 27 May, Kandel will speak at the Humboldt-Universität zu Berlin, giving a lecture entitled: "The Role of Functional Prion-Like Proteins in the Persistence of Memory: A Perspective" (Senatssaal, Unter den Linden 6, 10117 Berlin, 6:30 p.m.). Admission is free. (lb)

Agriculture: blending the traditional with the modern

MDR reporters Maren Beddies and Iris Völlnagel share their experiences from the third seminar programme for journalists

When we first met in autumn 2014, at the beginning of the seminar programme for journalists entitled “Between High-tech and Tradition – What Modern Farming has to Accomplish”, our expectations were just as varied as the group itself: 15 scholarship holders from radio, television and print media, including a journalist from weekly paper *Das Parlament* and editorial staff from German consumer organisation *Stiftung Warentest*. Most of us were hoping to delve deeper into the fabric of modern farming, establish contacts with experts, understand connections in the system, and acquire specialist knowledge. In short – to become experts ourselves.

It soon became clear that the diversity of the participating media would benefit both us as journalists as well as the researchers. Our discussions on specialist issues and media policy were not only confined to the seminar sessions; they also continued well into our breaks.

The first trip on our “Diving into Science” programme was to Braunschweig in Lower Saxony. Most of us were unaware of the city’s importance with regard to agricultural research. We visited the Johann Heinrich von Thünen Institute, which actively advises the German federal government on matters of agriculture, forestry and fishing. Here we engaged in an intensive discussion with Prof. Hiltrud Nieberg, who has been a member of the Federal Ministry of Food and Agriculture’s Scientific Advisory Board on Agricultural Policy since 2012. Prof. Folkhard Isermeyer, President of the Thünen Institute, was also a valuable partner – he dedicated a lot of his time to us and explained complex connections within the system in a way that was easy to understand. Many participants also enjoyed the opportunity to take a close look at a state-of-the-art tractor at TU Braunschweig.

The second programme was on our home turf as Leipzig-based journalists, but we still covered plenty of new ground. On the first day we visited the National Academy of Sciences Leopoldina in nearby Halle (Saale). The following day we had an excursion to the Leibniz Institute of Plant Genetics and Crop Plant Research in



Seminar participants at the Wiesengut research station (top); one of the herd of Limousin cattle kept at Wiesengut (left) – most recently, the hot topic has been soil as a crucial resource (right)

Fotos: CW / RBSG (2)



Gatersleben, where cold stores house one of the world’s largest seed banks (on a par with the international Spitsbergen seed vault), containing seeds from almost all species of plant in the world. Every year, the institute sends around 30,000 samples to farmers and researchers.

At the Julius Kühn Institute for Resistance Research and Stress Tolerance in Quedlinburg, researchers demonstrated

how gene-based techniques can help build resistance to pests. This was followed by a lively discussion between participants and scientists on the topic of genetic engineering.

Our third destination was Bonn. Director of the Centre for Development Research at the University of Bonn, Prof. Joachim von Braun, proved to be an excellent dialogue partner on the topic of global agricultural issues. At the University of Bonn’s teaching and research station for organic agriculture Wiesengut, we learned about how organic crop and livestock farming function best. Prof. Ulrich Köpke and his team showed us in a practical and clear way how organic farming can work in a mutually beneficial way for people and nature.

The final destination for this fourth seminar programme was Munich, and we had mixed feelings as we headed there. We were excited to learn more about bio-economy, animal breeding and nutrition, but we were sad that the programme was coming to an end. However, now that we are all farming experts, I’m sure we will meet again at some other agricultural media event.

(mb/iv)

SEMINAR PROGRAMME

A few days ago, the project’s advisory board, which has an equal number of scientists and media experts, met to decide on the topic of the fifth “Diving into Science” seminar programme for journalists. From autumn 2016 to spring 2018, 15 selected journalists will have the opportunity to dive into the world of “big data”. Project partners the Robert Bosch Stiftung and the Leopoldina are currently preparing the call for new scholarship applicants. Interested participants will soon be able to apply at:

WWW.TAUCHGAENGE-WISSENSCHAFT.DE

Current research findings on the topic of sight

Joint symposium of the Indian and German science academies held in Hyderabad (India)

As part of their strategic partnership, the Leopoldina and the Indian National Science Academy (INSA) held a joint symposium “Brain and Eye” in Hyderabad, India, on 1 and 2 February. Prof. Brigitte Röder ML of Universität Hamburg and Prof. Dorairajan Balasubramanian ML of LV Prasad Eye Institute in Hyderabad were responsible for the event’s scientific coordination.

Sight is the most complex of all our senses, and to understand it requires co-operation between various disciplines. The event brought Indian and German scientists together from fields including neurobiology, psychology, genetics and computational neurosciences, to present findings from experimental, theoretical and clinical research relating to the topic of sight. The presidents of both academies, Prof. Jörg Hacker ML and Prof. Raghavendra Gadagkar ML, participated in the event, along with a number of well-established experts in their fields and many Indian junior scientists.

The day after the symposium, Brigitte Röder ML gave a public lecture in



Participants in the “Brain and Eye” symposium

photo: INSA

LV Prasad Eye Institute’s main auditorium entitled “Sensitive Phases in Human Brain Development”. This lecture was organised jointly by the Leopoldina, the German Research Foundation and the Goethe-Zentrum Hyderabad. In his welcoming address, President Hacker took the opportunity to introduce the Indian public to the diversity of German research and to describe to the work of the Leopoldina as the national academy of sciences to all those present.

Prof. Hacker gave another public talk

on 4 February at the German House of Research and Innovation (DWIH) in New Delhi, an event organised by the Leopoldina, the German Embassy in India, and the DWIH. In his speech entitled “Science and Society – Infectious Diseases as an Example”, he described the causes and backgrounds to antimicrobial resistance and its consequences for society. During the lecture, he emphasised the Leopoldina’s national and international work in the area of policy advice, particularly with regard to the activities of the G7 academies.

(rn)

Providing policy advice worldwide

InterAcademy Panel Conference in South Africa

The Conference of the InterAcademy Panel (IAP), the global network of science academies, took place from 28 February to 1 March in Hermanus, South Africa, with a focus on the topic of “Science Advice”. The conference attracted more than 200 participants from over 80 countries, making it the largest IAP Conference to date. It was organised by the President of the Leopoldina Prof. Jörg Hacker and the President of the Academy of Science of South Africa (ASSAf) Prof. Daya Reddy, and was held to mark 20 years since the founding of ASSAf. The opening lecture by South African Minister of Science and Technology Naledi Pandor highlighted the importance of ASSAf as a body that has provided science-based policy advice for the democratic development of South Africa over the past 20 years. The participants then held conference presentations

and panel discussions addressing the issue of how national governments and global organisations like the UN incorporate scientific findings into their work.

Following the conference, the IAP

General Assembly elected a new Executive Committee and confirmed that Prof. Volker ter Meulen ML, former President of the Leopoldina, will serve for three further years as Co-chair of the IAP for Science. Prof. Krishan Lal, former President of the Indian National Science Academy (INSA), was newly elected as Co-chair. In addition, the General Assembly confirmed that developments over the past years have



The newly elected Executive Committee for 2016-2019.

photo: Ed Lempinen

contributed to closer cooperation among the three global academy networks: the InterAcademy Panel (IAP), the InterAcademy Council (IAC), and the InterAcademy Medical Panel (IAMP). Today, the new InterAcademy Partnership brings together more than 130 national science and medical academies with the goal of making better use of synergies in global science-based policy advice. (amg)

People

Deceased members

■ Bodo Christ ML

4 February 1941 – 30 January 2016 | Freiburg im Breisgau

Anatomy and anthropology

Embryologist Bodo Christ was especially active in the fields of early embryogenesis and developmental biology. Christ developed fundamental insights into the genesis of body wall metamerism, which have led to a deeper understanding of the development of the spine and ribs. Christ was a member of the Leopoldina from 2001. From 2006 to 2010, Christ was a deputy member of the Senate of the Anatomy and Anthropology Section.

■ Rudolf Haag ML

17 August 1922 – 5 January 2016 | Fischhausen-Neuhaus

Physics

Rudolf Haag worked on the rigorous mathematical formulation of quantum field theory. The Haag-Kastler axioms take an algebraic approach to quantum field theory, while the Haag-Ruelle theory formalises scattering theory. Haag's theorem demonstrates the inconsistency of the interaction picture of quantum mechanics. Through his research, Haag contributed significantly to the fundamental definition of terms in quantum field theory. Haag became a member of the Leopoldina in 1980.

■ Hayaishi Osamu ML

8 January 1922 – 17 December 2015 | Osaka, Japan

Chemistry

Hayaishi Osamu was a Japanese biochemist who studied the enzymatic oxidation process in cells. He discovered oxygenases and thus the way in which enzymes oxidise organic substrates. For most of his life, Osamu was Professor of Medical Physics at Kyoto University. Osamu was a member of the Leopoldina from 1978.

■ Marco Mumenthaler ML

13 July 1925 – 30 January 2016 | Zurich

Organismal and evolutionary biology

In the field of clinical neurology, Marco Mumenthaler specialised in peripheral neurological disorders and muscle diseases. He was President of the Swiss Neurological Society from 1969 to 1971. Mumenthaler's neurology textbook is still regarded as the standard work today. Mumenthaler became a member of the Leopoldina in 1978.

■ Dietrich Plester ML

23 January 1923 – 18 October 2015 | Tübingen

Ophthalmology, Otorhinolaryngology and Stomatology

Ear surgeon Dietrich Plester utilised microsurgical methods to help to improve

his patients' hearing. Plester conducted field trips to Sudan and Ethiopia to carry out his research on physiological hearing loss in the aging process. His main interest was the physiology and pathology of the middle and inner ear. Plester was a member of the Leopoldina from 1984.

■ Fritz Taege ML

16 June 1928 – 28 September 2015 | Halle (Saale)

Ophthalmology, Otorhinolaryngology and Stomatology

As Director of the Dental Prosthetics Polyclinic at Martin Luther University Halle-Wittenberg for many years, Fritz Taege contributed significantly to the reputation of dental research in Halle. As a scientist and physician, he dealt mainly with problems relating to prosthetics in dental, oral and maxillofacial medicine. Taege became a member of the Leopoldina in 1986.

■ Ole Wasz-Höckert ML

18 August 1918 – 23 October 2015 | Helsinki

Gynaecology and Paediatrics

Ole Wasz-Höckert conducted investigations in the field of neonatology. He used phoniatric methods to diagnose brain damage in newborns. Wasz-Höckert will be remembered as one of Finland's leading paediatricians. Wasz-Höckert was a member of the Leopoldina from 1978.



Leopoldina
Nationale Akademie
der Wissenschaften

Imprint

Deutsche Akademie der Naturforscher Leopoldina – Nationale Akademie der Wissenschaften

Jägerberg 1
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) (verantw.)
Prof. Dr. Dr. Gunnar Berg ML (gb)
Anna Baltrusch (ab)
Hannes Junker (ju)

Other authors in this issue:

Maren Beddies, journalist (mb)
Lilo Berg, journalist (lb)

Anna-Maria Gramatté, Scientific Officer, Department Science - Policy - Society (amg)
Dr. Ruth Narmann, Deputy Head International Relations Department (rn)
Iris Völlnagel, journalist (iv)
Dr. Stefanie Westermann, Scientific Officer, Department Science - Policy - Society (sw)

Photo credits:

Title: © niclasprimola – fotolia.com; © highwaystarz – fotolia.com; © Caroline Wichmann; © Adrian Niederhaeuser – fotolia.com

Design:

Agentur unicom, Berlin

Copyright

For the Leopoldina newsletter the copyright and all other rights are held by the Deutsche Akademie der Naturforscher Leopoldina – Nationale Akademie der Wissenschaften, Jägerberg 1, 06108 Halle (Saale), Germany. Redistribution, including in the form of extracts,

is permitted for educational, scientific and private purposes if the source is quoted (unless otherwise explicitly indicated by the article in question). Permission must be sought from the Leopoldina for commercial use

Links to external Websites:

Für alle in Leopoldina aktuell befindlichen Hyperlinks gilt: Die Leopoldina bemüht sich um Sorgfalt bei der Auswahl dieser Seiten und deren Inhalte, hat aber keinerlei Einfluss auf die Inhalte oder Gestaltung der verlinkten Seiten. Die Leopoldina übernimmt ausdrücklich keine Haftung für den Inhalt externer Internetseiten.

Unsubscribe:

Eine Abmeldung vom Newsletter „Leopoldina aktuell“ ist jederzeit möglich, Bitte senden Sie dazu eine E-Mail an presse@leopoldina.org.

Abbreviations:

ML = Member of the Leopoldina