

First World Health Summit in Berlin

The first World Health Summit, entitled “The Evolution of Medicine,” took place in Berlin on October 14-18, 2009. The conference was the brainchild of Berlin’s Charité school of medicine, which hosted the event in cooperation with the Université Paris Descartes. German Federal Chancellor Angela Merkel and French President Nicolas Sarkozy agreed to act as the patrons of the event. A total of around 700 experts from the worlds of science, politics and business assembled to discuss solutions to global health issues. “Good health is a fundamental human right, as well as an important economic factor,” stressed Professor Axel Kahn of the Université Paris Descartes, one of the two Presidents of the World Health Summit. “With an aging society, continuing inequalities, negligent actions and the resulting illnesses, this poses a real challenge. That is why every available resource must be mobilized,” demanded Mary Robinson, former President of

Ireland. She is also the chair of the GAVI Alliance, a non-governmental organization that champions healthcare for mothers and children in developing and newly industrialized countries, an improved health system in these nations and new technical solutions to provide access to medical care for all.

As part of the session on personalized medicine headed by Max Planck President Peter Gruss, and in light of constantly rising healthcare costs, the former Director of the National Institutes of Health (NIH), Elias Zerhouni, called for a paradigm shift in medicine, away from disease management and toward precision medicine that is capable of detecting and preventing diseases at the preclinical stage. Faced with an aging population and an increase in chronic diseases, the only way to reduce costs is through precise and personalized medicine, Mr. Zerhouni argued. The technological foundations are even now being laid by rapid devel-

opments in genome research, as well as in other fields of biology and in associated technologies. Experts regard climate change as the greatest global threat in the 21st century, holding it responsible for an estimated 300,000 deaths each year. And yet the subject of health was little more than a side issue at the recent Climate Conference in Copenhagen in December.

At the instigation of the Charité, a coalition of top-level international medical institutes and academies of science – the so-called M8 Alliance – was established during the World Health Summit. Its members “offer a guarantee of progress and accept responsibility for ensuring that every means available to academic medicine is exploited to achieve good health for all.” The Alliance aims to raise awareness of the urgency of global health challenges, and to intensify coordinated action on the part of politicians, civil society, industry and the medical community.

The Max Planck Society and Siemens Host a Future Dialogue



Some 40 years ago, in his book *The Limits to Growth*, Dennis Meadows sounded a warning that mankind was consuming resources at a faster rate than planet Earth could stand. At the Future Dialogue, hosted by the Max Planck Society and Siemens and attended by over 400 scientists, politicians and business managers, Meadows once again urged that “we must change our behavior.” As Max Planck Society President Peter Gruss emphasized, the challenge can be met only if science, industry and politics act together. Former German Foreign Minister Joschka Fischer argued that politicians must create a framework for more sustainable enterprise. Siemens, as CEO Peter Löscher explained, is already focused entirely on green technologies.

High-profile guests at the Future Dialogue: Siemens President and CEO Peter Löscher in conversation with Peter Gruss and Joschka Fischer (left to right). A video of Dennis Meadows’ presentation is available to download from <http://www.future-dialogue.org/en/highlights>.

“An entirely inadequate, halfhearted step”

Michael Hüttner is working on his doctorate at the Max Planck Institute for Biogeochemistry in Jena and is a member of the Young Expert Team representing the Global Observatory, a combined venture by young scientists set up to monitor the climate talks in Copenhagen.

Mr. Hüttner, are you frustrated?

Michael Hüttner: Yes, there is no other way to put it. From a scientific perspective, the minimal compromise that has been reached here is an entirely inadequate, halfhearted step in implementing the action plan agreed on in Bali.

What does the action plan call for?

Michael Hüttner: The nations attending the Bali climate conference in 2007 agreed to negotiate, over the next two years, a long-term global emissions reduction target with some ambitious medium-term targets for both industrialized and developing countries, as well as an effective system of monitoring these reduction commitments. At the same time, the industrialized countries promised financial support to assist the developing countries in adapting to climate change, introducing new technologies and reducing the emissions resulting from stripping and degrading their forests. Only in terms of financial commitments does the outcome of the Copenhagen conference go some way toward meeting expectations. Other than that, the notable feature of the Copenhagen Accords is the stated intention to limit the rise in average global temperatures to less than two degrees Celsius.

Just how binding is the two-degree guardrail?

Michael Hüttner: The final document is not an official United Nations resolution that requires a consensus between all nations. Instead of signing the document in recognition of its validity, the lead negotiators simply added an appendix confirming that they have noted it. This was the only way to arrive at any outcome at all. And in the end, the developing countries most affected were blackmailed into it. Had they objected, the aid commitments would have been null and void.

With almost 120 heads of state and government striving to reach agreement in Copenhagen, couldn't we have expected more to be achieved?

Michael Hüttner: The presence of so many senior statesmen and the huge commitment by society in general created a tremendous momentum that was not taken advantage of. It will be hard to recreate such a situation a second time.

Did you have the impression that the concerns of the scientists in Copenhagen found too little interest?

Michael Hüttner: The representatives of the German delegation consulted with us. For example, I had the chance to talk to the delegates about climate-related forestry policy – my field of research. Besides the official negotiations at these climate conferences, there are always fringe events where scientists present their latest findings. Normally the politicians are also there to listen, but this time, for example, German Development Minister Dirk Niebel stayed only long enough to deliver his own presentation and then left again. That shows the pressure under which the negotiations took place.

In what respects did the negotiators pay too little attention to the findings of science?

Michael Hüttner: Primarily in terms of the reduction targets needed to achieve the two-degree goal, and also the monitoring regulations that require states to document their efforts.

What reduction targets should the nations have set in order to achieve the two-degree limit?

Michael Hüttner: There is no direct causal relationship. We as scientists can only quote probabilities. There is a 50 to 70 percent chance that we will achieve the two-degree objective if, between now and 2020, the industrialized countries reduce their greenhouse gas emissions by 25 to 40 percent – relative to 1990 levels. The developing countries would have to reduce their emissions by 2020 by 15 to 30 percent relative to the present day.

So there is a substantial degree of uncertainty as to whether the two-degree goal will be met – even with much more ambitious reductions than those now agreed on?

Michael Hüttner:

Correct. Which is why I believe that the scientific debate should be followed up by a sociological debate on climate change. Society must ask itself: How great a risk are we willing to accept?

Take medications, for example: Who would be willing to accept even a 30 to 50 percent risk of serious side effects?

Bearing this in mind, is it sufficient for global emissions of greenhouse gases to peak between 2015 and 2020, and then slowly decline?

Michael Hüttner: From a scientific perspective, we really ought to be reaching the crest by 2015. If it takes until 2020 to reach that point, we would have to save 8 percent per year – the same amount as the EU tried to save over five years in the Kyoto protocol. That would be possible only with a huge economic effort.

So what will happen now?

Michael Hüttner: The first commitment period under the Kyoto protocol ends in 2012. In the future, there will presumably be, in addition to the Kyoto protocol with its strict rules on reductions and reporting, a second protocol with less stringent rules. Hopefully that is something the developing countries and the USA will then agree to. It will probably include another minimal compromise. However, I have hopes that the USA may change its stance once the elections to the House of Representatives next year are over and the Senate has reached a decision on the 17 percent reduction relative to 2005.



Michael Hüttner

LOEWE Center Launched in Marburg

Under the LOEWE program, the government of the German federal state of Hesse will make a total of 410 million euros in science sponsorship available through 2013. The LOEWE Center, inaugurated in Marburg in November, is dedicated to the fledgling research field of synthetic microbiology and bundles the broad-based microbiological expertise developed at the Max Planck Institute for Terrestrial Microbiology and the Philipps-Universität Marburg. Over the next three years, the LOEWE Center will receive 21 million euros in funding. This is the second LOEWE Center in which the Max Planck Society is playing a part – the state of Hesse has also already earmarked 15 million euros for a LOEWE Center devoted to lung and respiratory diseases with the involvement of the Max Planck Institute for Heart and Lung Research in Bad Nauheim.



Volker Nienhaus, President of the Philipps-Universität Marburg, with Science Minister Eva Kühne-Hörmann, scientists Bruno Eckhardt and Lotte Sogaard-Andersen, and Peter Gruss, President of the Max Planck Society (left to right).

The Lessons of Nature

Natural materials are comprised of very few components, yet they still possess a wide variety of microstructures. Nature needs just a tiny number of ingredients to create such composites as mother-of-pearl and teeth, which exhibit outstanding material properties such as high breaking resistance. In the

case of artificial materials, the opposite applies: generally, there are only a limited number of hierarchical levels, but a plethora of potential substances that can be combined.

A new program run by the German Research Foundation (DFG) is investigating the construction principles and

manufacture of hierarchically structured materials based on the models of nature. In 13 different projects involving more than 10 universities and Max Planck Institutes, scientists are attempting to develop high-performance materials inspired by insect hairs, nutshells and plants.

It Doesn't Have to Be Oil

The German Research Foundation (DFG) has approved eight million euros in funding for a new Collaborative Research Center (CRC/Transregio). Scientists from the Max Planck Institute for the Dynamics of Complex Technical Systems are joining with colleagues from the Otto von Guericke University Magdeburg, the TU Berlin and the TU Dortmund to study "integrated chemical processes in fluid multi-phase systems." They are seeking to develop new production processes that, in the future, will allow important basic crude-oil-derived chemicals to be replaced by comparable substances based on renewable raw materials. The funding is earmarked for a total period of 12 years.

Successful Result in the Contest for EU Research Funding

Max Planck Institutes were the recipients of a total of eight Advanced Grants awarded by the European Research Council (ERC) in 2009. This put the Max Planck Society in fourth place among the top research institutions in Europe (the CNRS, ETH Zurich and Cambridge University each received ten grants).

In Germany, the MPS tops the list, followed by the Ludwig Maximilian University Munich with three grants and the Technical University Munich and the Helmholtz Association with two successful applications each. The Advanced Grants can be applied for by established scientists. Six Starting Grants were awarded to Max Planck Society junior scientists in September last year.

New Supercomputer at the German Computing Center for Climate Research



A large part of the science underpinning the World Climate Conference in Copenhagen originated from the German High Performance Computing Center for Climate and Earth System Research (DKRZ) in Hamburg. The DKRZ has now taken delivery of a new 35-million-euro supercomputer funded by the German Federal Ministry for Education and Research. Codenamed “Blizzard,” the new climate computer

will allow the Center to forecast future climate changes with even greater accuracy. With a peak computing speed of 158 teraflop/s (floating point operations per second), Blizzard is around 60 times more powerful than its predecessor, and one of the world’s biggest supercomputers. Blizzard will even be able to model rotating storm systems and very small marine vortexes. In addition to studying the atmosphere and

One of the world’s largest supercomputers: Blizzard provided important data for the World Climate Conference in Copenhagen.

the oceans, with the new supercomputer scientists will be able to integrate processes that take place in ice, soil and vegetation, and their impact on carbon distribution, and thus also on the greenhouse effect.

On the Net



Diversity Is the Spice of Life

The website of the United Nations Association of Germany is a goldmine of information – and not just for school kids doing biology homework. Anyone with an interest in biodiversity can take a look at the image galleries of threatened animal and plant species and watch videos on the subject. Facts, figures and illustrative maps guide visitors through the history of the Convention on Biodiversity and the protection of species. This site successfully raises the curtain on the International Year of Biodiversity in 2010:

<http://www.dgvn.de/una-germany.html>

Dancing Inside Cells

An adult human being is made up of 100 trillion individual cells. Inside each of these cells, life follows a carefully choreographed routine: DNA is transcribed and translated into proteins that, in turn, are transported to the correct locations in the cell. A process that sounds as dry as dust when explained in a textbook becomes a work of art when biological animations are set to music and displayed using the latest computer technology. The “BioVisions” multimedia project undertaken by Harvard University is an open invitation to learn and be amazed:

<http://multimedia.mcb.harvard.edu/>

Age Research Online

The newly established Max Planck Institute for the Biology of Aging is now online with an attractively designed and informative website that is regularly updated. The site contains current news items, details of career opportunities and a clear description of the institute’s research focus and departments. A clear-cut color coding system also makes the site easy to navigate. Older visitors will also appreciate the facility to increase the text size, making the articles easier to read.

<http://www.age.mpg.de>

Lest We Forget

“The modern history of memory begins at the moment when one realizes that it is not just individuals who have the capacity to remember, but also collectives, nations, even cities,” says 2009 Max Planck Research Award winner Aleida Assman. The literary scholar, who is portrayed in this film, conducts research in Konstanz. Since the 1990s she has focused on the subject of cultural memory, remembering and forgetting. As a pioneer in the history of memory, she has frequently added a social dimension to debates on issues ranging from the Holocaust to the creation of a European culture of remembrance.

<http://www.filme.mpg.de>

Award-Winning Science Images

Whether by making art of science or seeing science through the eyes of art: Max Planck researchers regularly emerge as the winners of photographic competitions. Three of their pictures were singled out in 2009 as "Images of Research."



Top: Zebrafish grow in the space of three months from a fertilized egg cell to the stage of sexual maturity. The mouth aperture is already clearly identifiable in these two-day-old larvae. What look like eyes are indentations surrounded by lashes: the future olfactory organs. Scientists use these embryos as examples to study the development of tissue and organs. A genetic defect in the larva, shown here on the left, is causing problems in the development of the skin. Photo: Jürgen Berger, Mahendra Sonawane

Bottom: The dance of the praying mantis: As soon as this predator is in danger, she adopts a threatening posture. She displays her splendid coloring, spreads her limbs and throws her enemies into confusion. She is prepared at any moment to deal a lightning-fast counterblow with her hooked talons. Photo: Igor Siwanowicz





This colored scanning electron microscope image shows a white blood cell (dyed red) in the act of destroying tuberculosis bacteria (yellow). The bacteria are surrounded by the cell membrane of the scavenger cell, then drawn inside and rendered harmless.
Photo: Volker Brinkmann