



EUROPÄISCHE AKADEMIE

zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen
Bad Neuenahr-Ahrweiler GmbH

Direktor: Professor Dr. Dr.h.c. Carl Friedrich Gethmann

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FOCUS

Thoughts on climate research and policy

Hans von Storch, Hamburg/Geesthacht, and Nico Stehr, Friedrichshafen

The climate issue requires both scientific analysis and political decision-making. Perceiving climatic impacts, possibilities and necessities through the lens of political interests will hardly achieve long-term success. Quite to the contrary, a dispassionate scientific analysis is needed to present the various options in detail and thus to enable normative political decisions. To this end, climate research is in need of self-reflection. Fundamental scientific values such as contradiction, openness, sustainability, independence of individuals and falsification, enable science to unfold its potential as an action-guiding knowledge provider. For this purpose, the natural sciences need input from the social sciences, cultural studies and a discerning public.

Knowledge of climate change

The global climate – what we call the statistics of our weather – is changing due to the impact of human activities. Temperature frequency distributions are presently witnessing a shift towards higher values that will continue almost everywhere in the foreseeable future; sea levels are rising and rainfall quantities are changing. Some, but not all, extremes will change. The primary motor behind these changes is the release of greenhouse gases. That is the *scientific construct* behind man-made climate change.

But what is the public’s perception of climate change? That the climate is changing because of humanity. That the weather is less reliable than it used to be, and that the seasons are less predictable. Extreme weather takes on catastrophic, unheard-of shapes. What is the reason behind this? Human greed and stupidity. The mechanism behind it: justice – the revenge of nature. If our climate changes, civilisation is jeopardised; entire cultures will perish, such as Viking settlements in Greenland. That is the *media-cultural construct* of climate change, consistent with *our culture* and perpetuated by *our media*.

These two constructs compete in their interpretations of a complex environment; they are two “actors” in the knowledge market.

Of course, the practice of science is also influenced by the construct of media and culture because scientists themselves are always also caught up in their own culture. Their culture conditions their perception, guides them in their scientific research and their readiness to accept certain answers as argumentatively sufficient.

Post-normal science

If science must remain uncertain in its concrete statements, if scientific statements are of great practical import to formulating policies and making urgent decisions while affecting societal values, then that kind of science is less and less driven by pure “curiosity” but rather by the usefulness of its possible statements to decision-making and politics. It becomes “post-normal” (Funtowicz and Ravetz, 1985). Methodological quality no longer occupies centre stage, but rather societal acceptance.

Science in its post-normal stage relies on its consistency with cultural constructs. Knowledge claims are not only raised by recognised scien-

tists, but also by other experts serving specific interests.

Climate research is presently in a post-normal state. Its inherent uncertainties are enormous since future projections must be made, and such futures can only be presented in the form of models and under conditions which have yet to be observed. This lack of knowledge has nothing to do with incapacity on the part of the scientists. Rather the problem lies in the scarcity of available facts and the incomplete nature of instrumental data – it spans much too short a period for the collection of reliable data necessary for the description of climatic variations across decades and centuries. Naturally, arguments exist which favour one answer or the other, and some considerations of plausibility allow us to exclude certain developments as unlikely or even impossible. However, there remains a degree of uncertainty which may not substantially diminish for many years to come.

Under such circumstances, representatives of societal interests tend to pick those knowledge claims which best support their position. The scientifically untenable film *The Day After Tomorrow* has been praised for increasing public awareness; political and scientific achievements were mixed up when the Nobel Peace Prize was awarded to Al Gore and the IPCC; professors have explained to the public – from a scientific angle – the supposedly inevitable reactions to the climate change. In addition to such alarmist tendencies, there is also the sceptical counterpart, manifesting itself in such creations as Micheal Crichton's *State of Fear* or the film *The Great Swindle*.

None of this can be considered what is rather vaguely described as “good science” where critical inquiry, clever testing and unconventional ideas result in real progress, rather than just being useful in the implementation of a policy which is perceived as being right.

The honest broker

But how should scientists deal with the present post-normal situation when both claims – conducting good science and giving sound advice to the public – are accepted as legitimate? For the analysis to achieve depth and substance it needs the help of the social sciences and cultural studies. Up to now, these two fields of study have more or less stood on the sidelines, while in fact there exist some excellent examples of successful supplementary social science research, e.g., the “Honest Broker” analysis by Roger A. Pielke, Jr. (Pielke, 2007).

According to this analysis, there are five types of scientists who engage in communication with the public in different ways. “Pure scientists” are essentially driven by curiosity and have little interest in putting their research results in a societal context. “Science arbiters” enable a correct understanding of indisputable scientific facts.

Both types fit well into “normal” science which is able to answer questions with a high degree of certainty, and whose answers are non-controversial regarding possible societal applications. “Issue advocates” invest their scientific competence in the furthering of a value-oriented agenda. The consequences of scientific insight are narrowed to an interest-compliant “solution”. The “honest brokers” widen the scope of practical options, thus enabling the political process to choose the “solution” which is desired by society. The fifth type refers to the “stealth issue advocates” who are, by way of their actions, “issue advocates”, while pretending to be “science arbiters” or “honest brokers”.

Obviously, the “honest broker” is best suited to enable society to choose solutions to its controversies, despite uncertain knowledge about interconnections and possibilities, in a manner which is both rational and consistent with its values.

Sustainability

Science is a social activity which has the objective of *creating new knowledge*. Just like any other social activity, science can be conducted sustainably – or not.

Society expects science to create knowledge in order to aid in the understanding of a complex environment. Why do we entrust “science” with this role? The answer lies in the methods used by science. Scientific methods ensure that we are usually offered “coherent” interpretations allowing for actions which lead to the desired outcomes. “Incorrect” interpretations do occur, but tend to be rare. They are usually discovered sooner or later and replaced by a “coherent” interpretation.

According to science theorist Robert K. Merton (Stehr, 1978; Grundmann, 2010), there are a few significant principles, such as disinterestedness and organised scepticism which present an idealisation which can never be fully realised. However, such principles do describe what the public views as a prerequisite for accepting knowledge claims. Only if such principles are respected, scientific practice can be conducted in a sustainable way, or, more specifically, only then will the public, the media and decision-makers listen to our current post-graduate students as closely 20 years from now as they listen to us scientists today.

So, where does climate research stand when seen in the light of Merton's criteria? *Do self-serving interests influence research results?* There is no agreement on this matter: Two camps, the “sceptics” and the “alarmists”, vehemently argue with each other over the political usefulness of their statements, while both groups only partly accept results as “correct” if they contradict their fundamental convictions. *Do knowledge claims undergo critical analysis*

and attempts at falsification by critical professional colleagues? – This area also has its deficits. Gradual scepticism is accepted, while radical scepticism is punished by exclusion from the science community. In publicly debated cases over the past four months, falsification has been obstructed by the withholding of data required for duplicating the analysis.

In recent months, public trust in climate research has significantly eroded. For instance, SPIEGEL magazine questioned people as to whether they were personally fearful of climate change. In 2006, 62% agreed, while in 2010 only 42% agreed; in the US, Gallup asked people whether they believed the dangers of climate change were exaggerated; in 2006, 30% agreed, while in 2010 this figure had risen to 48%.

This erosion of trust is fundamentally based on a change of perception, since the key scientific messages about man-made climate change outlined above remain just as plausible as before. The problem is that these key messages have been complemented with more messages – for instance regarding the extinction of species or the number of heat-related deaths; these are interesting scientific hypotheses, but they are again and again used argumentatively as politically relevant facts. The exaggerations in the report made by the second IPCC working group can be named as relevant examples. These exaggerations, while minor in scale, contradicted the principle of sustainability in scientific practice. They made the representations by the IPCC look like a “bubble” which, in the eyes of the public, has now burst.

It is imperative that sustainability be restored; the most important element in this process is to restore the different functions of “politics” and “science”. It is the task of politics to arrive at decisions which have comprehensible and normatively acceptable consequences; science, however, must explain interconnections, independent of normative systems. Politics must not hide behind would-be scientific necessities – such necessities do not exist in climate policy, just as the goal of reducing global warming to two degrees in relation to the pre-industrial status quo has little scientific grounding. Science must not be guided by the political usefulness of its statements. Politics and science may co-operate well as a team, but their roles and functions are completely different.

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Professor Nico Stehr, Ph.D., F.R.S.C., is Professor for Cultural Sciences at the Zeppelin University (Karl-Mannheim-Chair) in Friedrichshafen. For further information on literature please e-mail to hvonstorch@web.de.

PROJECT GROUPS

Nanoparticles for medical purposes.**Technical, medical, and ethical aspects**

■ On 1 May 2010, the Europäische Akademie started a new project on nanoparticles for medical purposes.

Nanotechnology surely is endowed with enormous potential for medical innovation and economic revenue. However, this technology also bears potential risks that may cause considerable social, ethical and legal problems. Questions to be dealt with are, for example, the following: What are the moral boundaries for using human materials and animal models for this research? What will determine social acceptance of nanotechnological applications in medicine? Are there any moral boundaries of introducing nanotechnology into our life world? How should a balanced legal regulation of research and application of nanotechnology look like? Though public concern about these issues cannot be ignored, the scientific study of these risks is still in its infancy. Nanoparticles, an especially promising application of nanotechnology in medicine and the main focus of this project, show, due to their smallness, novel physical properties affecting their toxicological behaviour. These physical properties are only partially known so far, thus, a risk evaluation – balancing medical benefits versus adverse effects – is methodologically demanding since it has to be performed under partial ignorance. Further points of interest are adverse health effects on third parties such as medical personnel and pollution of the environment.

The project aims at an interdisciplinary memorandum on the social, ethical, and legal implications of applying nanotechnology for medical purposes. The project group consists of European scholars from different fields of nanotechnology with hands-on experience in the application of nanotechnology in medicine, complemented by experts on ethical and legal issues of research.

The project is part of the EU-funded NanoDiARA consortium which is co-ordinated by the Europäische Akademie Bad Neuenahr-Ahrweiler GmbH.

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Interdisciplinary research and transdisciplinary claims of validity

■ On 28 May 2010, the working group held its second regular meeting in Bad Neuenahr-Ahrweiler. The members discussed relevant topics and keywords to be included in an outline of the methodological study on interdisciplinarity. A corresponding catalogue will

be finalized within the next few weeks. Papers were given on the structural character of advisory acting (Georg Kamp), on problems of scientific based policy advice (Carl Friedrich Gethmann) and on the advisory role of technology assessment (Gerd Hanekamp). Finally, Kamp's contribution on the interdisciplinary praxis of the sciences was thoroughly discussed, especially with respect to premises and conditions of interdisciplinary research as well as regarding its differentiation from transdisciplinarity. Both Kamp's and Gethmann's paper have already been published as foci of the academy's Newsletter 98 and 60.

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CONFERENCES

Ethics and technology assessment – is there an “ethicization” of technology?

■ This question was the central focus of the 10th conference on technology assessment (TA) organized by the Austrian TA-Institute (ITA) from 31 May until 1 June 2010 in Vienna with more than 100 participants. The event gave an interesting survey of the current discussions, also in the field of participative TA.

Nowadays ethics is increasingly used by both opponents and supporters of technical progress in their argumentation. Due to this ethical boom TA has to discuss its position(s), especially as new areas within science are emerging: What kind of existing ethical standards are adequate for the latest developments in science such as synthetic biology? Do we need new standards with growing intervention depth of new technologies?

During the first day of the conference the phenomenon of ethicization was discussed both theoretically (e.g. the boom of ethicization; ethical clarification instead of moralization) and by demonstration of examples (nanotechnology; robotics). On the second day specific subjects were focused in workshops (e.g. synthetic biology; climate protection).

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NEWS

Meeting of the Sponsors' Club

■ The 14th board meeting of the Sponsors' Club of the Europäische Akademie took place on 6 May 2010. The sponsors welcomed one new member and discussed the new topic of this year's Ahrtal Talks; it will take place on 17 November 2010 in the town hall of Bad Neuenahr-Ahrweiler and the topic will be: “Will the Deutsche mark come back?” (disputants: Universitätsprofessor Dr. rer. pol. Karlhans Sauernheimer, University of Mainz, and Universitätsprofessor Dr. jur. Dr.-Ing. E. h. Dieter Spethmann, University of Düsseldorf). The next board meeting will take place on 2 September 2010 when a new chair will be elected.

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Night of Science 2010 in Bonn

■ Both the work of the Europäische Akademie and various topics of the academy's current projects were presented in Bonn in an exhibition tent during the Night of Science 2010. Dr.-Ing. Bert Droste-Franke, Dipl.-Phys., gave a lecture on “Welche Energietechnologien sind langfristig nutzbar?” (Which energy technologies are realisable in the long run?). Other scientific members of staff of the Europäische Akademie held lectures to pupils and students and discussed the topics with them (see “Lectures” in this Newsletter edition). For further information about the Night of Science 2010 in Bonn see www.bonner-wissenschaftsnacht.de.

PUBLICATIONS

Margret Engelhard

■ “Neues Leben? Möglichkeiten und Herausforderungen der synthetischen Biologie”, in: *Die Politische Meinung*, 488 (6/2010), 31–35

Thorsten Galert

■ “Das optimierte Gehirn – Potenziale und Risiken des pharmazeutischen Enhancements psychischer Eigenschaften”, in: *Technikfolgenabschätzung – Theorie und Praxis* 19/1 (2010), 67–70

CURRENT PROJECTS OF THE EUROPÄISCHE AKADEMIE

- **Deep brain stimulation in psychiatry. Guidance for responsible research and application** (duration 10/08–9/11)
- **Energy storages and virtual power plants for the integration of renewable energies into the power supply. Potentials, innovation barriers and implementation strategies** (duration 1/09–6/11)
- **Clinical research on vulnerable populations** (duration 12/08–6/11)
- **Radioactive waste. Technical and normative aspects of its disposal** (duration 10/08–9/10)

LECTURES

Bert Droste-Franke

9/6/2010

■ “Energy related projects at the Europäische Akademie GmbH”

Kick-off Meeting, IEA ECES, Annex 26, Fraunhofer UMSICHT, Oberhausen

25/6/2010

■ “Welche Energietechnologien sind langfristig nutzbar?”

Night of Science 2010 in Bonn

Margret Engelhard

27/5/2010

■ “Synthetische Biologie? Chancen und Risiken einer neuen Technologie”

Ringvorlesung Ledomo des Fachbereichs Agrarwissenschaften, Universität Kassel

25/6/2010

■ “Synthetische Biologie: Leben aus dem Reagenzglas?”

Night of Science 2010 in Bonn

Thorsten Galert

4/6/2010

■ “Psychostimulanzien für die Leistungsgesellschaft – Ethische Probleme des Neuro-Enhancements”

Pharmacon, Bundesapothekerkammer, Meran, Italy

16/6/2010

■ “Die Bedeutung des Authentizitätsbegriffs für die Ethik des Neuroenhancements”

Oberseminar (Universitätsprofessor Dr. Dr. h.c. Carl Friedrich Gethmann), University of Duisburg-Essen

Carl Friedrich Gethmann

10/6/2010

■ “Die Aktualität der Phänomenologie. Über-

legungen zur De-Naturalisierung und De-Mentalisierung der transzendentalen Subjektivität”
Inaugural lecture (honorary professorship), University of Cologne

11/6/2010

■ “Das menschliche Genom als Vorgabe und Aufgabe”

Conference “Jenseits des Menschen”, Center for Interdisciplinary Research, University of Bielefeld

21/6/2010

■ “Die ethischen Präsuppositionen der Technikfolgenabschätzung. Ein Revanchefoul”

Colloquium on the occasion of Universitätsprofessor Dr. rer. nat. Armin Grunwald's 50th birthday (KIT, Technical University of Karlsruhe)

22/6/2010

■ “Gibt es ein Recht auf Mobilität?”

PRO Flughafen e.V., Frankfurt am Main

Kristin Hagen

24/6/2010

■ “Was können Tiere fühlen und denken, und was hat das damit zu tun, wie wir mit ihnen umgehen (dürfen/sollen)?”

Night of Science 2010 in Bonn

Ulrike Henckel

24/6/2010

■ “Darf man Selbstmord verbieten?”

Night of Science 2010 in Bonn

Georg Kamp

24/6/2010

■ “Verantwortung für radioaktive Abfälle”

Night of Science 2010 in Bonn

PERSONALITIES



■ Jens-Peter Schneider holds a chair in German and European administrative law including energy law and is director of the European Legal Studies Institute at the University of Osnabrück. In 2009 he was offered a chair of administrative science by the German University of Administrative Science Speyer and a chair of public law by the University of Freiburg.

He studied law and economics at the Universities of Marburg and Freiburg and holds a doctor's degree in law of the University of Freiburg (Dr. jur). He received the *venia legendi* at the University of Hamburg with a comparative analysis of the liberalization of energy markets in the USA, the UK and Germany taking into account also EU energy law.

Schneider was a visiting research fellow at the University of Oxford and guest professor at the Andrassy University Budapest. He is founding member of the Dornburg Study Group on Administrative Law in Europe, key member of the interdisciplinary Osnabrück Jean-Monnet Centre of Excellence in European Studies and co-coordinator of ReNEUAL – the research network on EU administrative law.

His teaching and publications address German and European public law as well as energy law. He is co-editor of a leading German handbook on energy law (3rd edition forthcoming). He worked as an expert in the field of energy law for several ministries, private enterprises and the German national Academy of Sciences Leopoldina.

Universitätsprofessor Dr. jur. Jens-Peter Schneider is Professor of German and European administrative law at the University of Osnabrück. He is member of the current project group “Energy storages and virtual power plants for the integration of renewable energies into the power supply. Potentials, innovation barriers and implementation strategies” of the Europäische Akademie (duration 1/09–6/11).

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