



# Europäische Akademie

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

Direktor:  
Professor Dr. Carl Friedrich Gethmann

## RESEARCH REPORT

2001 – 2002



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Bad Neuenahr-Ahrweiler GmbH

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## Foreword

The Europäische Akademie GmbH hereby presents its third research report, which refers to the period 2001/2002. This is in compliance with the plan announced in the foreword to the research report of 1996–1998 to submit a research report at intervals of every two years. The report now submitted refers to the first period after the five-year founding phase of the Europäische Akademie which was completed by an evaluation. As little has changed since then with regard to the structure of the research activities, the form and compilation of the report has fundamentally stayed the same. The projects which have already been described in earlier research reports are summarized in the appendix in order to permit a further overall view of the activities of the Europäische Akademie. For the same reason the prospective section of the report is also brought up to the latest state-of-the-art with regard to the planning. It concerns the projects of the fourth generation, the realisation of which is planned from 2003 to 2005.

Now that the projects of the third generation have been concluded or have reached the final phase, the chosen method concept of interdisciplinary research can be deemed successful and the instrument of interdisciplinary project groups, after the completion of 9 projects, can be said to have proved itself. Besides interdisciplinarity, the international character of the work has been further consolidated through the international membership of the working groups. As a consequence, the English language has been established to a great extent as the working language of the Europäische Akademie, as it is also evident in the present report. Furthermore, with the projects “Electronic Signatures” and “TAMI Technology Assessment in Europe: between Method and Impact” (a joint project required by the EU in combination with a number of scientific institutions) new variations were tested. In the meantime, the Europäische Akademie has successfully managed to recruit a considerable amount of external contributions (external contributions in 2002 more than 20%) into its subject fields and working structures. To take its place alongside the proven publication institutions, the scientific journal “Poiesis & Praxis” has been founded.

The report serves to document the interdisciplinary and international approach of the research activities of the Europäische Akademie. Through the work of the Europäische Akademie constitutionally disciplinary

science performs its task in providing scientific council to society. In this, science appears not as the object but as the subject of research on itself. Above all, through the spring and autumn conferences, the numerous expert meetings and the four publication institutions (scientific publication series “Ethics of Science and Technology Assessment” [“Wissenschaftsethik und Technikfolgenbeurteilung”], “Graue Reihe”, scientific journal “Poiesis & Praxis” and Newsletter) the scientific work is conducted in a way that affords full transparency for the pertinent scientific communities and the general public.

The results presented could only be achieved because many scientists were prepared and willing to devote time and energy to the project and study groups. The team of colleagues of the Europäische Akademie now comprises ca. 120 scientists, who, together with the 9 full-time employed scientists, form the “intellectual capital” of the academy.

Thanks are due to the partners, to the Bundesland Rhineland Palatinate (*Land Rheinland-Pfalz*) and to the German Aerospace Center (*Deutsches Zentrum für Luft- und Raumfahrt e.V.*) for their continued help and support. The project sponsorship of the Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung*) was a further indispensable basis for the scientific work. Through the founding of the non-profit association “Sponsors of the Europäische Akademie Bad Neuenahr-Ahrweiler” (*Förderer der Europäischen Akademie Bad Neuenahr-Ahrweiler*), the integration into the region has been further consolidated; special thanks is due to the Mayor of the town Bad Neuenahr-Ahrweiler, Dr. Tappe, who is also chairman of the “Sponsors of the Europäische Akademie, Bad Neuenahr-Ahrweiler”.

May this report serve to document to its readers that the work of the Europäische Akademie is fulfilling the expectations placed upon it.

Bad Neuenahr-Ahrweiler, March 2003

Carl Friedrich Gethmann

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# I. Scientific Concept

## 1. Mission and Aims

The Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen Bad Neuenahr-Ahrweiler GmbH is devoted to the scientific investigation and assessment of consequences of scientific and technological developments for the individual and social life of human beings and their natural environment. The main focus is to examine foreseeable medium and long-term processes which are influenced especially by natural and engineering sciences and by the medical disciplines. The Europäische Akademie bases its work on the assumption that the sciences have the task, beyond providing specialised scientific information, of also making *orientational knowledge* available. Therefore, an *interdisciplinary* approach is required, bringing together the results from natural sciences, engineering sciences and medical disciplines with thematically relevant studies in philosophy, jurisprudence, economics and social sciences. In addition, the foreseeable results of research and development are to be related *transdisciplinarily* to the expected societal needs and positions.

The Europäische Akademie implements its tasks by taking up and developing further approaches to technology assessment, the ethics of technology and medical ethics. The Europäische Akademie seeks to assist in finding a rational way for society to deal with the consequences of scientific and technological developments. This aim is mainly achieved by developing and recommending options upon which to act, with respect to long-term societal acceptance. The rational resolution of conflicts in the area of science and technology is an important prerequisite for long-term, reliable science and technology policy.

The work of the Europäische Akademie is mainly conducted by temporary interdisciplinary project teams. Members of the project groups are especially qualified scientists from universities and from non-university research institutions in Europe, and in special cases representatives of oth-

er social fields such as business. The project groups work together for two years in an independent manner. Transdisciplinary issues, involving several project groups, are dealt with in *study groups* by the staff of the Europäische Akademie and invited scientists.

## **2. Structure**

The Europäische Akademie was constituted on 11<sup>th</sup> March 1996 as a ‘gemeinnützige Gesellschaft mit beschränkter Haftung’, i.e. a non-profit corporation with limited liability. Its partners are the Bundesland Rheinland-Palatinate (*Land Rheinland-Pfalz*) and the German Aerospace Center (*Deutsches Zentrum für Luft- und Raumfahrt e.V. – DLR*). Managing director of the company as well as director of the academy is Professor Dr. phil. Carl Friedrich Gethmann, who is a full professor of applied philosophy at the University of Essen. The Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung*) contributes to the financing of the Europäische Akademie in the form of its project funding.

The *Partners’ Assembly* has formed a *Managing Committee* to which two representatives of the partners belong. It also nominated a *Scientific Advisory Board* which supports the Europäische Akademie in elaborating scientific goals and projects as well as in evaluating research results. The members of the different working groups form the *Council* (Kollegium) of the academy which is a forum for scientific exchange on subjects concerning the activities of the Europäische Akademie.

The number of staff members has been successively increased. Meanwhile, all positions for scientific and non-scientific staff have been filled in accordance with the currently valid organisational structure (cf. appendix V, section 4). In addition, it has been possible to fund the positions for three scientists from external sources. In the period under report, five doctoral candidates were employed at the Europäische Akademie (cf. section IV, 6.2) as well as three research fellows (cf. section IV, 7). One doctoral

candidate completed his doctorate at the Europäische Akademie (cf. section IV, 6.2). At present, there are nine scientific and seven non-scientific staff members working at the Europäische Akademie.

In the period under review, the following projects were completed and their results published: “Electronic Signatures”, “Robotics”, “Climate Prediction and Climate Precautions”, “Sustainable Development and Innovation in the Energy Sector” (cf. section II, 1). The project “Functional Foods”, funded by the Federal Ministry of Education and Research (BMBF) and the Rhineland Palatinate foundation, “*Stiftung Innovation des Landes Rheinland-Pfalz*”, is in its final phase of completion.

The Newsletter (*Akademie-Brief*), as the regular news organ of the Europäische Akademie, has meanwhile been published in its 35th issue; since issue number 16, the Newsletter has appeared mainly in English (cf. section IV, 3.3). In the meantime, from the publication “Graue Reihe” – intended for the documentation of materials on topical subjects from the scientific activities of the Europäische Akademie – the 32<sup>nd</sup> volume has now been published (cf. section IV, 3.2).

In the book series “Ethics of Science and Technology Assessment” (*Wissenschaftsethik und Technikfolgenbeurteilung*) – as a publication organ for the project reports and other monographs or anthologies concerning the work of the Europäische Akademie – 18 volumes have been published so far (cf. section IV, 3.1). The periodical, “Poiesis & Praxis”, as an international discussion forum for ethics of science and technology assessment (the third issue of which went into print at the end of the period under review) rounds off the spectrum of publication organs (cf. section IV, 3.4).

The internet homepage of the Europäische Akademie, where current information on projects, conferences as well as the current Newsletter can be found, is available at <http://www.europaeische-akademie-aw.de>.

### **3. Results and Scientific Integration**

#### **3.1 Results**

From the beginning the Europäische Akademie aimed at working on projects dealing with social problems generated by the whole spectrum of the sciences and not just a subset – be this the medical sciences or the technical sciences. Based on this broader approach the Europäische Akademie has realized a couple of projects that dealt with problems coming from areas as diverse as climate change, sustainable development and robotics. In the coming years too, this attempt to develop a common method for the study of scientific and technological advance will be carried on. In addition, the work on the methodological foundations used in its work has been continued as it can be seen from the publication list of the in-house and external publications of the staff members of the Europäische Akademie.

#### **3.2 Integration into the European Scientific Community**

Over the last years it happened that in the majority of projects run by the Europäische Akademie the working language became English. This concession to the development of scientific co-operation on the European level improved the international integration of the Europäische Akademie considerably – as it is reflected in the composition of the scientific council with members from currently 13 European countries. In addition, staff members of the Academy come from 5 European countries. It is hoped that this internationalisation of the Europäische Akademie will continue over the next years.

## **II. Results of Research**

### **1. Project Groups**

#### **1.1 Electronic Signatures. Cultural Controllability and Moral Justifiability (completed) (Elektronische Signaturen. Kulturelle Beherrschbarkeit und moralische Verantwortbarkeit)**

It is not unusual that technical developments, such as electronic signatures, come up against legal, social and cultural obstacles. Since such technical developments, on closer analysis, give rise to a series of questions, for example, in connection with costs, the improvement of cryptographic security and the strengthening of trust.

These questions – and others – involved in this complex issue were addressed in the course of an interdisciplinary European project entitled, “Electronic Signatures. Cultural Controllability and Moral Justifiability”, conducted at the Europäische Akademie. This was an obvious approach, since the only suitable way to recognize and grasp comprehensively the cultural and social implications of the new technology upon which electronic signatures are based is by viewing the issue from various interdisciplinary standpoints.

##### *1.1.1 Task Definition*

The trends and various forms of the IT products, already recognizable today, though still in the process of rapid development, are producing, at the same time, their own weaknesses and vulnerability – their systemically inherent “Achilles Heel”. That this real scenario, emerging within the information society, is not simply a figment of imagination is evidenced, among other things, by the lack of protection for digitalised intellectual property, new forms of commercial espionage and the lack of a legally binding regulatory framework for electronic trading.

The latter – also known as e-commerce – is a buzzword that is being used more and more frequently in connection with the internet. One of the decisive characteristics of e-commerce is the use of the decentralised and “insecure” internet. This is certainly one of the reasons why those users engaging in “online-shopping” are still demonstrating notable reserve. For one thing, the various traders seek to blame the lawmakers, but with the introduction of the Information and Communication Services Act (IUKDG), the legal basis has already been established. And for another thing, the users are allegedly much too security conscious and are said to be lacking in trust. The users, however, and this is proven by statistics, are indeed interested in participating in e-commerce without constraints. And this is where digital signatures, above all, particularly in view of the single European domestic market, shall become the driving force to enable users to avail themselves of the multifarious offers provided by electronic trading.

### *I. Electronic Signatures*

Seen from the technical point of view, an electronic signature represents a kind of seal, which is used to sign the electronic data in a similar way to a handwritten signature under a contract. It is based on a mathematical process, which, with the help of cryptographic methods, produces an electronic signature. This kind of intercommunication no longer requires paper, and handwritten, typed or printed script, in the wake of this changing form of society, is losing its significance. The electronic signature shall guarantee the authenticity and integrity of the digitally signed document.

Electronic signatures have many uses, such as, for example, for the electronic tax declaration, medical prescriptions, home banking, communication between physicians, clinics and pharmacies, for electronic commerce, for the exchange of documents between citizens and authorities, between different authorities, between business partners (e.g. for contracts) or for the issuing of electronic ID cards.

## II. Technical and Societal Aspects of the Electronic Signature

From the technical and legislative point of view, it is indeed possible, by means of the electronic signature, to achieve a more binding and concrete basis for e-commerce. Building upon this, efforts are currently being made to advance progress in the technical and organisational establishment of trust centres, such as TeleSec and D-Trust, in various fields of application for electronic signatures, like, for example, in some local governments (Media-Kom) and in the German Federal Administration (SPHINX). However, trustworthy electronic communication in global contexts, and this is long since nothing new, does not emerge solely on the basis of functioning technology and not only based on laws – almost automatically – but rather it must be rendered communicable as a social learning process.

The project of the Europäische Akademie set itself the task to draw into the centre of consideration some of the hitherto (as yet) unasked or (as yet) unanswered questions. Faced with the fundamental (cultural) “disruption” caused by the changeover from the personally handwritten signature to the electronic signature, and the complexity of the (technical, organisational and legal) structures and interactions between man and technology connected with it, questions and answers must be found in regard to the following issues:

- Cultural, moral dimensions
- Socio-psychological dimensions
- Compulsively security-conscious society (*Sicherungszwangsgesellschaft*)
- Legal dimensions
- Technical dimensions
- Economic dimensions
- Overall European dimensions

Not only from various disciplinary “access points” and “angles of view” but, on top of this, there must also be a dialogue, bridging the borders between all disciplines. Whereby, in view of the global aspects involved,

it is evident that an approach “centred on Germany” is inadequate and that, therefore, a trans-national view is needed.

*III. Recommendations, Assessments and Consequences*

“The introduction of electronic signatures will give new impulses to crisis-ridden online shopping”. This was the widely-voiced, unanimous opinion regarding the strategic importance of the electronic signature within the framework of a global, electronic service society.

Although this is nothing new, it is nevertheless becoming clearer and clearer that neither legislation – such as signature acts or guidelines – nor technology alone can achieve by themselves what is absolutely needed: to enable trustworthy, technically effected communication between partners who do not know each other, but who wish to maintain and cultivate their communication links via virtual, open networks.

It is not unusual that new technical developments – especially when their occurrence involves cultural changes – give rise to problems of acceptance. The problem derives primarily from the fact that the object under examination – advanced electronic signatures – is a highly complex issue. As already outlined, there are completely new kinds of legal, economic, social, psychological, cultural and philosophical questions, waiting to be answered in the form of practically oriented recommendations for action in order to transform, in a culturally controllable manner, the current blind flight into a historic, new, technical epoch.

The unusual thing is the small degree to which interdisciplinary considerations have been recognized and taken into account in the process accompanying the propagation of electronic signatures. For the specific, expert questions involved must not be seen and addressed separately. There exists, worldwide, hardly any established knowledge on which to base orientation in preparing to cope with the imminently approaching, targeted and deliberately occasioned cultural break – away from the personally handwritten signature towards the electronic signature – as a global, socially challenging learning process. Thus, for this synthesis, there is no alternative.

With this in mind, this project again picked up the findings left dormant from earlier discourse, which it then extended by adding supplementary questions of more recent date.

In principle, the project group proceeded in accordance with the following theoretical assumptions.

*Assumption 1:*

Digital signatures, applied appropriately, contribute to the success of electronic tele-cooperation. They open new perspectives on the way to the further development and implementation of the aims of data protection. The protection of citizens' privacy is placed on a new footing.

*Assumption 2:*

The way in which electronic signatures function cannot be comprehended by the citizen without further ado. Therefore, they are perceived as disturbing and used insufficiently. The required technology-friendly understanding of their role cannot necessarily be taken for granted. In consequence of this, electronic signatures will not constitute a real increase in security and what remains will merely be an assumed security.

*Assumption 3:*

The sensual experience so far involved in the act of signing and in recognizing the personal handwritten signature will be reduced to a formal process – to be performed by the computer. The human touch is no longer needed. “Trust” – as an inter-personal value – is degraded to a technical operation.

*Assumption 4:*

The unmistakable progress in Germany towards a new practice of electronic commerce and electronic services stands more and more conspicuously in the way of further European integration. In order to alleviate predictable

irritations and economic and social distortions and time-lags, success must be achieved in incorporating expectations within an overall European process. Only in this way the threat of reversing the progress achieved in a multi-medial service society can be avoided.

From this comprehensive claim, the yardstick for assessing the recommendations that have been worked out is derived. In this, it was necessary to develop the necessary substance in order to be able to approach the new potency of electronic signatures which doubtless appears to be on a historical scale, with scientific results that are, at least, on a level with today's assessable technical challenges.

The findings of the interdisciplinary study on electronic signatures were broken down and summarized according to topic fields, and recommendations were made under the following categories:

- General recommendations
- Cultural change
- Consumer protection, user protection and data protection
- Technical qualities
- Shaping, testing and dealing with risks
- Europe

The recommendations thus presented are to be understood as the cornerstones of a widened foundation. It is hoped that this will trigger the expected new impulses and that these are in accordance with the historically established principles of law, order and democracy. The integrated and precisely formulated recommendations provide the actors with the necessary, and so far lacking, knowledge base in such a way that invites them to reflect upon, orient and shape their own actions accordingly.

### *1.1.2 Working Method*

A preliminary project concept was presented to the Scientific Advisory Board in March 1999. In September 1999, the Scientific Advisory Board evaluated the work schedule submitted by the project group as positive.

The project group was appointed at the inaugural meeting on the 16<sup>th</sup> and 17<sup>th</sup> September 1999. In the first two meetings, the project group structured the field of work more precisely and discussed the first seed-texts on the issues of cultural controllability, the legal and technical dimensions as well as the history of the signature. Moreover, the planning was completed for the Kick-off Meeting of the group. The interdisciplinary discourse on the progressive questions of “The Cultural Controllability and Moral Justifiability of Digital Signatures” took place in Boppard on the 2<sup>nd</sup> and 3<sup>rd</sup> December 1999 in cooperation with the BSI (Bundesamt für Sicherheit in der Informationstechnik). Besides the members of the project group, further experts gave talks, presenting the various problem areas of digital signatures. These talks and the working groups of the Kick-off Meeting were attended during these two days by approximately 80 participants.

The starting point for the consultations of the selected body of experts was provided by the draft memorandum, the contents of which had been considerably further developed. On 19<sup>th</sup> July 2000 an initially even larger number of recommendations were evaluated at a workshop organised by the project group. By means of this preliminary expert evaluation, it was possible to receive impulses from a broader spectrum of the expert public and to bring these impulses into the on-going work of the project group. On 23<sup>rd</sup> November 2000, the memorandum was submitted to the Scientific Advisory Board of the Europäische Akademie.

### *1.1.3 Findings*

The establishment and development of trustworthy electronic communication requires an interdisciplinary process. Technology alone does not create trust and laws alone do not provide protection for trustworthy electronic communication in every day life. Therefore, the further development of trust in a new kind of security infrastructure demands a societal learning process. The research findings of the interdisciplinary project group of the Europäische Akademie on the cultural controllability and moral justifiability of digital signatures shall enable the perspective

assessment of the possible areas in which the aforesaid scientific and technical developments take place. With this in mind, the Europäische Akademie gives priority to addressing the relevant scientific and technological bodies, particularly on the national and European level. The results of the work of the project group will possess the character of recommendations and will be summarized in the form of a memorandum. These results shall trigger impulses in the complex, multi-level process of trust building through the various different societal actors – above all, the European Parliament, the Federal German Parliament, the parliaments of the federal states ; federal and state ministries; IT enterprises; the relevant lobbies and interest groups; the trades unions, the churches, consumer and data protection organisations; NGO's; training establishments.

#### *1.1.4 Publications*

Langenbach C J (1999) Didaktik im Spannungsfeld zwischen NetUse und IT-Sicherheit. In: BSI (ed) *Zur Didaktik der IT-Sicherheit. Interdisziplinärer Diskurs zu querschnittlichen Fragen der IT-Sicherheit*. SecuMedia Verlag, Ingelheim

Langenbach C J (1999) *Elektronische Unterschrift. Verliert der Bürger seine Identität?* Newsletter no. 15, Europäische Akademie, Bad Neuenahr-Ahrweiler

Ulrich O (1999) *Protection Profile – ein industriepolitischer Ansatz zur Förderung des ‚neuen Datenschutzes‘*, “Graue Reihe” no. 17, Europäische Akademie, Bad Neuenahr-Ahrweiler

Banse G, Langenbach C J, Ulrich O (1999) *Digitale Signaturen im Weitblick*, KES 99/5, SecuMedia Verlag, Ingelheim, pp 85 – 87

#### Final Report

Langenbach C J, Ulrich O (eds) (2002) *Elektronische Signaturen. Kulturelle Rahmenbedingungen einer technischen Entwicklung*, Springer, Berlin Heidelberg New York (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 12)

*1.1.5 Members*

Chair: *Dr. rer. pol. Otto Ulrich*

Referat Technikfolgen-Abschätzung, Bundesamt für Sicherheit in der Informationstechnik (BSI), Bonn

*Professor Dr. sc. phil. Gerhard Banse*

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Project Coordinator: Dr.-Ing. Christian J. Langenbach

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Duration: 9/99–11/01

## **1.2 Robotics. Options for Human Replaceability (completed) (Robotik. Optionen der Ersetzbarkeit des Menschen)**

### *1.2.1 Background and Tasks*

Robots must have at their disposal a range of basic skills if they are to be enabled to perform actions in the world. To these basic skills belong, for example, the ability to move (from place to place), which is frequently accomplished by means of wheels. Alternatively, “natural” ways of moving from place to place are copied by constructing legs, wings, scales, fins, etc. The capacity to perceive is achieved by cameras and other sensors from whose data a model of the surrounding world is created. The third important aspect consists in the ability to learn, whereby the learning of a sequence of movements, learning to interpret the model of the surrounding world and the learning of reflexive modes of orientation, e.g. how the robot perceives its own position in regard to its environment, are seen as the most significant fields. Robots that possess these capabilities are called “autonomous robots”.

Given that robots are developed by man in order to perform certain active tasks, then the artificial agent may be regarded in this context as a means to an end. On the other hand, should it prove impossible to develop a robot to perform a certain action, the task on hand remains unchanged and so man will seek to perform it by other means. In this sense, a robot can replace human capabilities. Thus the assessment of technical consequences accompanying a technical development may pose the question regarding human replaceability.

The perspectives of various scientific disciplines are encompassed in this question field (Decker 1997). Initially, the science of robotics can merely judge the technical replaceability of humans. The basis for this

judgement will generally consist of a catalogue of the requirements of a specific application. From the economic point of view, it must be considered whether such a replacement, business-wise or economically, will “pay off”. The legal disciplines decide who should bear responsibility for the actions performed by the artificial agent which, for example, can play a part in deciding questions of liability. These perspectives are directly coupled with moral aspects out of which ethical norms may be developed and with the aid of which human replaceability can be judged.

Particularly in the area of service robots, one of the most important fields of application for autonomous robots, the question arises as to the evaluation of human capabilities. After all, the term *service* is not only connected with attributes such as functionality, profitability, safety and reliability, but also with friendliness, communicability and understanding. In its research project, “Robotics”, the Europäische Akademie sets out to find criteria with the aid of which it is possible to deem human replaceability by artificial agents desirable or undesirable. The setting-up of an interdisciplinary group of experts has made it possible to take into account the different perspectives of the various individual disciplines. Monthly meetings over a period of two years provide the opportunity for intensive discussion which shall lead to the formulation of well-founded recommendations for action that are regarded as acceptable by all disciplines.

The case studies of the project have been selected from the field of medical application. Here are to be found many niches in which autonomous robots can be employed, such as for prostheses, in the care of patients or for surgical operations. At the same time, it is a field in which the aforementioned questions present themselves in a relevant context.

The findings of the research project were published in a memorandum (Christaller et al. 2001), in which, along with the recommendations for action, the chain of arguments leading to said recommendations is also presented. In this way the memorandum contributes to facilitating the political decision-making process when it is a matter of legislation or the

promotion of research, while on the other hand, it helps to provide the basis for well-founded discussion in our society.

### *1.2.2 Working Method*

Following the inaugural meeting on 5<sup>th</sup> February 1999, the Kick-off Meeting was held in April 1999, at which external experts contributed to widening the discussion basis for the project. The following ladies and gentlemen professors kindly followed the invitation to attend: Dr.-Ing. Rüdiger Dillmann (Institute für Process Computer Technology und Robotics, Karlsruhe University); Dr.-Ing. Rolf Eckmiller (Institute for Informatics VI – Neuroinformatics, Bonn University); Dr. Gudela Grote (Institute for Work Psychology, ETH Zürich); Dr. Fritjof Haft (Chair for penal law, penal proceedings law, law philosophy and law informatics, Tübingen University); Dr. Peter Janich (Chair 1 for Philosophy, Philipps-University Marburg); Dr. Thomas Metzinger (Philosophy Department, University of California at San Diego); Dr. Helge Ritter (Technical Faculty – Neuroinformatics, Bielefeld University); Dr.-Ing. Dr. h.c. Rolf-Dieter Schraft (Fraunhofer-Institut for Process Technology and Automation, Stuttgart).

The talks given at the Kick-off Meeting were published in volume 16 of the “Graue Reihe” of the Europäische Akademie (Decker 1999). On the occasion of the Kick-off Meetings it was agreed that the discussion contributions should be treated confidentially. For this reason, the discussion minutes were only distributed in writing to the members of the project group in order to permit the stimulus given by the external experts to find its way into the work of the project group.

At the so-called Mid-term Meeting, which took place in Bad Neuenahr-Ahrweiler from 3<sup>rd</sup> – 4<sup>th</sup> April 2000, the project group discussed its work up to that point with further external experts. The latter were called upon to evaluate the work already conducted by the project group as well as to nominate further aspects that needed to be considered. The results of these discussions, as well as the pertinent internal debates within the group, have been directly incorporated into the texts of the memorandum. The

following gentlemen professors kindly followed the invitation to attend: Dr. D. Birnbacher (Philosophical Institute, Düsseldorf University); Dr. van Eimeren (Institute for Medical Informatics and System Research GSF-Research Centre for Environment and Health, Oberschleißheim); Dr. A. Grunwald (Institute for Technology Assessment and System Analysis [ITAS], Karlsruhe); Dr. P. Janich (Institute for Philosophy, Philipps-University Marburg); Dr. W. Mazal (Institute for Labour and Social Law, Vienna University); Dr. T. Lüth (Surgical Robotics Lab, Charité Berlin); Dr. F.-W. Mohr (Clinic for Heart Surgery, Heart Centre Leipzig); Dr. L. Philipps (Institute for Law Philosophy and Law Informatics, Munich University).

At the project group meeting, held in Munich on 14<sup>th</sup> July 2000, the project group discussed the topic “The Direct Connection of Robots to the Human Nerve System”. For this purpose, Professor Dr. Henning Scheich from the Leibniz Institute for Neurobiology at Magdeburg University was invited to talk on this subject.

Since the beginning of this project, a total of 21 project group meetings have been conducted, most of which were scheduled for one day and therefore were held at Munich or Düsseldorf airports, respectively, in order to minimize traveling time. One meeting each was held at the Institute for Robotics of the ETH in Zürich, at the Institute for Autonomous Intelligent Systems of the FhG in St. Augustin near Bonn and at the Institute for Robotics und Mechatronics of the DLR Oberpfaffenhofen. In the laboratories of these institutes, the project group members were able to observe autonomous robot systems and gain an impression of the state-of-the-art.

The development of the so-called “seed texts”, running parallel to the continuing interdisciplinary discussion, was supported by the setting up of a virtual desktop. In this way, it was possible for all project group members to view and comment on each, respective, up-to-date version of the text.

### *1.2.3 Results*

The project group submitted the memorandum according to schedule to the Europäische Akademie’s Scientific Council for its perusal. The latter

evaluated and approved the study. Thus the study (Christaller et al. 2001) could be presented to political representatives, the press and interested members of the public in the House of Science (Haus der Wissenschaft) in Berlin on 28<sup>th</sup> November 2001.

In addition, the studies commissioned by the project group were also published (Christaller, Decker 2001). On the subject, “Natural Intelligence. Concepts, Development and Measurement” a study was conducted by Dr. phil. Dipl. Psych. B.O. Hütter from the RWTH Aachen to distinguish the parallels and the borders between the terms natural and artificial intelligence. The subject, “Man-Machine Interface”, was dealt with by J.-H. Heinrich, M.A., und H.-P. Riegel, M.A., Institute for Philosophy of Essen University. The comparison of legal aspects in Germany, England, France, Austria and Switzerland entitled: “The Allocation of Liability for the Actions of Robots in the Field of Private Legal Liability” was conducted by Professor Dr. H. Ofner from the Institute for the Comparison of Laws at the University of Vienna. The findings of this study were taken into consideration in the memorandum of the project group.

On 30<sup>th</sup> April 2002, the study was presented, in the presence of State Secretary, Dr. Thomas of the Ministry for Education and Research (BMBF) to interested Heads of Section in the BMBF. The short talks were held by the project group members Professor Dr. T. Christaller, Professor Dr. J.M. Gilsbach and Professor Dr. D. Sturma.

The project group organized a workshop on 18<sup>th</sup> September 2001, on the occasion of the KI annual conference in order to discuss the project results with the scientific experts of the KI Research. Professor Dr. T. Christaller and Dr. M. Decker discussed the project results on 5<sup>th</sup> February 2002 with representatives of industry at the annual meeting of the Robotics Division of the VDMA. In addition a number of public talks were given on the subject.

#### *1.2.4 Publications*

Christaller T, Decker M, Gilsbach J-M, Hirzinger G, Lauterbach K, Schweighofer E, Schweitzer G, Sturma D (2001) *Robotics. Per-*

*spectives for Human Action in Future Society*, Springer, Berlin Heidelberg

Christaller T, Decker M (2001) *Robotics. Perspectives for Human Action in Future Society, Materials Compendium*, “Graue Reihe” no. 29, Europäische Akademie, Bad Neuenahr-Ahrweiler

Decker M (1997) *Perspectives of Robotics. Considerations on Human Replaceability*, “Graue Reihe” no. 8, Europäische Akademie, Bad Neuenahr-Ahrweiler

Decker M (ed) (1999) *Robotics. Introduction to an Interdisciplinary Discussion*, “Graue Reihe” no. 16, Europäische Akademie, Bad Neuenahr-Ahrweiler

Decker M (1999) *Robotics. Options for Human Replaceability*. TA-Datenbanknachrichten, vol. 8, No. 3/4, pp 72-74

Decker M (2002) *Robotics. Perspectives for Human Action in Future Society*. In: *Technology Assessment. Theory and Practice*, no. 2, vol. 11, pp 107-114

#### Final Report:

Christaller T, Decker M, Gilsbach J-M, Hirzinger G, Lauterbach K, Schweighofer E, Schweitzer G, Sturma D (2001) *Robotik. Perspektiven für menschliches Handeln in der zukünftigen Gesellschaft*, Springer, Berlin Heidelberg New York (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 14)

#### 1.2.5 Members

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*Professor Dr. med. Dr. sc. Karl Lauterbach*

Institute for Health Economics and Clinical Epidemiology, Cologne University.

*Professor Dr. jur. Dr. rer. soc. oec. Erich Schweighofer*

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Duration: 2/99–12/01

### **1.3 Climate Prediction and Climate Precautions (completed) (Klimavorhersage und Klimavorsorge)**

#### *1.3.1 Background and aims of the project*

Climate conditions and the related effects have been accepted as given by fate for a long time throughout the history of mankind; that was why only a passive role, if any at all, had been attributed to human society. This can be explained by the dynamics and complexity of climate processes which are difficult to describe. The human role which is becoming more and more likely to be considered an active one within the climate system, and the corresponding future climate scenarios that can be deduced from it, have led to the fact that human beings are now about to lose the “innocence” they have claimed so far. Consequently, causes of climate change as well as reactions thereupon have built in the meantime an operative correlation, that is to be justified. The possible risk of an ultimate climate change and its meaning for mankind as a whole and for individual regions

is, however, subject to highly controversial and partially emotional discussions in science and the public.

Meanwhile, stronger evidence for an anthropogenic influenced climate change emerged according to the publication of the 3<sup>rd</sup> assessment report of the Intergovernmental Panel on Global Climate Change (IPCC) in 2001. Projected impacts of respective change may have adverse and severe consequences for certain countries as well as for future generations. Therefore, rationality and legitimacy of corresponding precautionary measures for climate protection should have to be proved, especially with regard to the uncertainty, incompleteness and limited validity of its contemporary scientific base.

Thus, the task of this project was threefold: (1) critical stocktaking of the scientific knowledge from the relevant disciplines; (2) assessment of the methodological instruments of climate research; (3) evaluation of the objectives, principles and strategies claimed by climate politics.

### *1.3.2 Working progress*

The Europäische Akademie initiated a corresponding research project on “Klimavorhersage und Klimavorsorge”. A pre-phase specification of open questions to be answered was published by volume 6 of the “Graue Reihe” of the Europäische Akademie. At the end of the year 1998 an interdisciplinary project group was constituted; it was consolidated further in 1999 both in personnel as well as in its disciplinary representation. Finally, eight experts were nominated as members of the project group.

The Europäische Akademie organised an international workshop on “Climate Modelling and its Economic Consequences” in Bad Neuenahr on December 1998 which launched the start to the project’s working phase. Some of the participating external experts were among others: Dr. C. Böhringer (Zentrum für Europäische Wirtschaftsforschung, Mannheim), Dr. A. Ganopolski (Potsdam Institut für Klimafolgenforschung), Professor Dr. P. Hennicke (Wuppertal Institut für Klima, Umwelt und Energie), Professor Dr. H. D. Jacoby (Massachusetts Institute for Technology, Cam-

bridge/USA), E. C. Meyer (Universität Münster), Professor Dr. H. G. Nutzinger (Universität Kassel) and Professor Dr. R. G. Prinn (Massachusetts Institute for Technology, Cambridge/USA). The results of this workshop were published as volume no. 15 of the “Graue Reihe”.

The first project phase was on stocktaking of relevant disciplines as well as on transdisciplinary reflection of empirical and methodological questions. In certain cases, various external experts were consulted for discussion of specific aspects of the climate problem.

After completion of 12 progress meetings, the project group held its Mid-term Meeting by discussion with several external experts. The latter gave constructive inputs to the further project work. Participants were Professor Dr. C. Backes (Universiteit Utrecht), Professor Dr. D. Birnbacher (Universität Düsseldorf), Dr. H. Kohl (Umweltbundesamt Berlin), Professor Dr. R. Pethig (Universität Siegen), Dr. K.-H. Simon (Universität Kassel) and Professor Dr. H. von Storch (GKSS Forschungszentrum, Geesthacht). Moreover, Professor Backes gave a study paper on “Klimaschutz in den Niederlanden” on behalf of the Europäische Akademie and for access to the project group. This paper was also published as volume no. 23 of the “Graue Reihe”.

The second project phase was on the evaluation of aims and principles of climate politics as well as on the formulation of conclusions on the insights of the whole project work. After 18 working sessions the findings and recommendations of the project group were finally approved by the Scientific Advisory Board of the Europäische Akademie on October 2001. The final report was presented to the public in Berlin on 6<sup>th</sup> May 2002. The project results were also presented to selected bodies of experts (the National IPCC Coordination Office, among others).

### *1.3.3 Results*

The main outcome of the project may be summarized as the following:

Scientific research on the possible future development of greenhouse gas emissions, the development of the global climate and its effects for human

beings and the environment give cause for substantial *worries*. Nevertheless in the light of incomplete scientific knowledge and scientific uncertainty about probabilities and effects of climate change, it is possible to justify controversial evaluations of possible measures and their potential consequences. Presently an unambiguous and concluding, i.e. “final” evaluation of the underlying justification structures seems to be impossible.

It is the aim of continuous climate and climate impact research to reduce the *incompleteness* and *uncertainty* of the knowledge base. However, due to fundamental reasons, these cannot be eliminated. Acting in the light of climate politics remains acting with uncertainty. Acting with uncertainty can and should be oriented towards normative criteria of rational risk evaluation.

There is a need for justification when climate-related action has been carried out or has been postponed. The action is always to refer to the present knowledge level. Here rationality and acceptability of decisions in the field of climate politics depend upon whether the underlying descriptive and normative grounds *are made explicit for later review*.

Existing *principles for action* in the field of international environmental law and environmental politics (precautionary principle, intra- and inter-generational fairness, sustainability etc.) are necessary for the justification of national and international climate protection politics, but are not sufficient for the definition of an operative strategy for climate policies. These principles are to be included however, to serve as guidelines for climate politics. But they are subject to various interpretations and are to be put in concrete terms. The same applies to the principle of adequacy which limits precautionary measures. The open and normative relations between precautionary motivations and appropriateness of measures cannot be unambiguously defined, but are subject to interpretation.

The implementation of the above mentioned principles does not determine specific strategies or measures to be selected. The orientation towards the precautionary principle, in particular, does not imply the decision whether to prefer preventive or adaptive strategies. Both strategies include precautionary aspects. Depending upon the realisation of either

preventive or adaptive action patterns, diverse *conflicting objectives* may emerge from the relevant conditions, costs and (side-) effects.

In light of the discrepancy between the need for climate research information and its incompleteness, short-term and serious interventions in the economic system in favour of a massive prevention strategy do not seem to be justified. It must also be taken into consideration that short-term massive interventions in the economic system bear *risks for society* as well. Therefore, long-term predictable (e.g. calculable) measures which come into effect gradually are to be taken. In the near future, they show comparatively less effects on the climate system, but if continuously applied, they stand for a long-term effect. They should be realised step by step according to the principle of adequacy.

A high ability to learn and a substantial level of reversibility can be implemented during such an alteration process. This refers to the setting of interim objectives, to modifications of the intended hierarchy and to the measures. Current empirical knowledge, taken from the constant monitoring of climate changes and their modelling results, is to be included as well as findings about the formulation of standards within the society and the effectiveness and side-effects of individual instruments. The idea of *flexible planning* in the field of climate protection allows experience to be gained with the operation of new instruments and allows them to be used in further planning steps. Additionally it allows climate politics to react to current scientific findings without giving up the aim of precaution. In relation to that, the post Rio process is to be considered a decision process consisting of several steps; it seems to be appropriate for the planning task as far as its *structure* is concerned – although not necessarily as far as its concrete results are concerned.

The appropriateness of precautionary climate policy actions can be evaluated on the grounds of different criteria, for example, economic and/or ethical *rationality* – with quite different results. Any neutral or overriding meta-perspective, that would enable a “definite” or “final” evaluation of the superiority of some specific criteria or derived findings is absent. The plausibility of the appropriate argumentation patterns is to be reviewed only transversally, by critically comparing contrary patterns of justifica-

tion. More specific evaluations are full of uncertainties, because, on the one hand it is hardly possible to calculate a climate path which stands for an economic optimum, and on the other hand, the preferences, life styles and possibilities for adaptation of future persons can only be predicted within certain limits; and this makes it difficult to uphold the maxims of intergenerational fairness.

A wide range of possible climate policy interventions are about to be discussed. Relevant options on various national, European and international levels are characterised by specific requirements for effectiveness and/or efficiency. In the light of climate prevention and its presumed urgency, the short-term realisation of measurements for *flexible mechanisms* and the strict exploitation of possible “No-regret” potentials seems to be reasonable, as long as these are available immediately and effectively. Furthermore, legal instruments can be involved if necessary, at different time intervals, to secure the long-term effectiveness of climate protection.

On the *national level*, it would be more conducive to the aim of long-term climate protection to develop protection strategies that go beyond the year 2005, than to achieve the set objective of reducing CO<sub>2</sub>-emissions by more or less exactly 25% and nothing more than that. It is the challenge for long-term climate politics to introduce over a period of 20 to 30 years a re-orientation of the energy supply system, that does not depend so heavily on carbon fuel.

The present outline of the *Kyoto Protocol*, whose ratification has been basically made possible due to the results of the Bonn and Marrakesh conferences in Summer and Autumn 2001, is, as many observers put it, not sufficient. Although some of its details have been criticised by the public and by scientists, it seems to be a basically appropriate means to outline the general climate protection concept. This is because the content of the Protocol which has become less substantial due to the concessions, made *inter alia* in the field of quantified reduction units, is to be considered separately from the Protocol's high relevance in the field of international contract law. It offers the perspective to establish binding periods of time in the future, and therefore it is the only basis on which to introduce long-term, effective and favourable climate development by using the means of

international contract law. In the future decades, the *Kyoto Protocol* can be adapted to the latest findings of climate research and, if necessary, be tightened within future binding periods of time. The contractual commitments established during the Bonn conference, are to be considered minimum objectives of climate politics which do not basically exclude that individual nations or several EU states take on further pace setting roles, as they have already taken on in other political fields. Such pace setting roles however, must be particularly justified.

#### *1.3.4 Publications*

Lingner S, Gethmann C F (1997) *Klimavorhersage und -vorsorge*. “Graue Reihe” no. 6, Europäische Akademie, Bad Neuenahr-Ahrweiler

Lingner S (1999) *Klimavorhersage und -vorsorge*. Aufgaben und Ziele eines interdisziplinären Forschungsprojekts. *TA-Datenbank-Nachrichten* 8 (2): 26-28, ITAS Karlsruhe

Schröder M, Lingner S (eds) (1999) *Modelling Climate Change and Its Economic Consequences. A Review*. “Graue Reihe” no. 15, Europäische Akademie, Bad Neuenahr-Ahrweiler

Schröder M, Claussen M, Grunwald A, Hense A, Klepper G, Lingner S, Ott K, Schmitt D, Sprinz D (2002) *Climate Prediction and Precautions (Summary)*. “Graue Reihe” no. 23, Europäische Akademie, Bad Neuenahr-Ahrweiler

#### Final Report:

Schröder M, Claussen M, Grunwald A, Hense A, Klepper G, Lingner S, Ott K, Schmitt D, Sprinz D (2002) *Klimavorhersage und Klimavorhersorge*. Springer, Berlin Heidelberg New York (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 16)

#### *1.3.5 Members*

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Duration: 12/98–12/01

## **1.4 Sustainable Development and Innovation in the Energy Sector (completed) (Nachhaltige Entwicklung und Innovation im Energiebereich)**

### *1.4.1 Research Goals*

The concept of Sustainable Development is central for the development and implementation of policies concerning environmental issues. The concept of innovation plays the same role in the economic and scientific

field. The terminological specification of these concepts is intended to help those involved in the corresponding discussions to grasp these more precisely and to organize them specifically towards their particular ends.

Furthermore it is generally accepted that sustainable development – however defined – has to rely on innovative technologies. To examine this relation more closely the focus is set onto the energy sector which shows paradigmatically the bias between an enormous resource consumption which makes this sector promising for reduction, and the importance for all areas of life which limits the reduction potential dramatically. On a solid terminological basis recommendations are given for the relevant policy areas as well as for further research agendas.

#### *1.4.2 Working procedure*

The first meeting took place on 31<sup>st</sup> August and 1<sup>st</sup> September 2000. A central working question was identified: How far will innovations alone take us towards a sustainable energy system. Only when this question is answered we can know whether further issues have to be addressed. During the second meeting from 19<sup>th</sup>–21<sup>st</sup> December 2000, the members of the project group each presented their presumed work package. These were evaluated in terms of a coherent work program. On 19<sup>th</sup> January 2001, the project's Kick-off workshop was held. The work packages were presented to a group of experts, who were asked to determine gaps in the research agenda as well as additional aspects to be addressed. Present were: Professor Dr. Wilhelm Althammer (Handelshochschule Leipzig), Professor Dr. Nicholas Ashford (MIT, Cambridge), Dr. Gerd Eisenbeiß (DLR, Köln), Dr. Klaus Rennings (ZEW, Mannheim), Dr. Herwig Unnerstall (Universität Leipzig), Professor Dr. Alfred Voß (Universität Stuttgart) und Professor Dr. C.-J. Winter (Energon AG, Überlingen).

After this meeting the group worked out a structure for the study according to the revised work program. The single chapters were designed interdisciplinarily and written by sub-groups coordinated by one group member.

The next milestone for the group's work was the Mid-term-Workshop, held on 9<sup>th</sup> November 2001. A draft version of the study was presented to a group of experts. Present were: Professor Dr. Dr. Brigitte Falkenburg (Universität Dortmund), Herr Professor Dr. Wilhelm Althammer (Handelshochschule Leipzig), Dr. Gerd Eisenbeiß (Forschungszentrum Jülich), Priv.-Doz. Dr. Volker Radke (Berufsakademie Ravensburg), Dr. Klaus Rennings (ZEW, Mannheim), Dr. Herwig Unnerstall (Universität Leipzig). The group's work was identified as expedient in terms of the initial objectives. However, in accordance with the group's time schedule, the experts encouraged the group to further focus the recommendations.

This and the further integration of the single chapters was accomplished during the next work phase that ended with the last meeting from 9<sup>th</sup>–10<sup>th</sup> May 2002. All meetings were held in Bad Neuenahr-Ahrweiler.

After the approval of the study by the academy's Scientific Council, it was presented in Berlin to the public on 21<sup>st</sup> October 2002 (Representation of Rhineland-Palatinate).

### *1.4.3 Results*

Almost every energy scenario is based on trends that would lead to an enormous growth in the demand for energy in the coming decades. Meanwhile, at international conferences among other places, one is concerned with the opposite outlook, a massive reduction of greenhouse gas emissions, especially of CO<sub>2</sub> emissions caused by energy consumption. Experts also point out the political risk of depending on mineral oil and remind us of the fact that resources are not inexhaustible. How can this chasm be bridged? How can we shape a more sustainable energy system from the existing one? Hopes are mostly pinned on technological progress and innovations.

So far, however, there are no specific suggestions concerning the extent to which innovations can really contribute to reconciling ever-growing energy consumption with the limitations referred to, regarding the avail-

ability of resources and the environment, and with the structural demands on any energy system.

The study examines potentials of sustainable energy innovations in terms of given environmental policies as well as energy security and reliability. These innovations can solve the conflict between the rising energy demand and the restrictions necessary. The recommendations are based on an analysis of target conflicts and actors in the energy sector. The following strategic measures are central:

- (1) Energy, according to its importance, should regain a top priority in the political arena.
- (2) Highly targeted subsidies should be given for a limited amount of time to speed up the market introduction of energy-efficient and regenerative techniques in analogy to the ‘Dutch model’.
- (3) Negotiated agreements and unilateral self-commitments can subsequently ensure further market diffusion of sustainable energy innovations.
- (4) The basic research in energy should not be diminished but intensified instead.

#### *1.4.4 Publications*

Hanekamp G, Steger U (eds) (2001) *Nachhaltige Entwicklung und Innovation im Energiebereich*. “Graue Reihe” no. 28. Europäische Akademie, Bad Neuenahr-Ahrweiler

#### Final Report:

Steger U, Achterberg W, Blok K, Bode H, Frenz W, Gather C, Hanekamp G, Imboden D, Jahnke M, Kost M, Kurz R, Nutzinger H G, Ziesemer Th (2002) *Nachhaltige Entwicklung und Innovation im Energiebereich*. Springer, Berlin Heidelberg (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 18)

*1.1.5. Members*

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Duration: 9/00–8/02

**1.5 Functional Foods (Duration: 1/00–12/02)  
(Funktionelle Lebensmittel)**

*1.5.1 Background and Tasks*

Functional foods represent the third generation of healthy foods and their emergence will change further common perceptions of food and health

and could possibly have important socio-economic consequences. The implications of functional food developments can be accounted for in two main areas: diet-related diseases and the modern food debate.

In terms of individual health and physical condition, the situation in western societies is giving rise to concern as we are faced with diet-related diseases of proper epidemic proportions. A daily diet overwhelmed with fat and sugars has been the norm for the past decades in most European and North American households. The result is an epidemic of obesity that spreads not only to the majority of the adult population but also more worryingly to the new generation who have rarely the option of alternative diets. Moreover, as scientific proofs for the link between diet and disease (particular cardiovascular diseases and some cancers) accumulate, there is an increasing number of calls for action. It is within this situation that Functional Foods have developed. They assume a highly targeted solution to diet related diseases with effective reduction of risk and improved physical and mental well being. The emerging 'functional food science' is focusing research on the effects of functional foods on growth, development, metabolism, the cardiovascular system, intestinal physiology, and even on behavioural and psychological functions (FAIR, 2000, vol 1). In view of these facts, it should appear necessary to assess and evaluate the developments in food production in terms of their effect on the individual consumer and society at large.

Moreover, Functional Foods are introduced in society at a particularly sensitive moment when food has been high on the political agenda for many years. As a result of food scandals such as BSE, dioxin, foot and mouth disease, etc. and also partly due to public discontent arising from the introduction of genetically modified foodstuffs in the market, food has become a main issue in public debates and a focal point of political activity in Europe. Against the background of eroding consumer confidence in food regulatory authorities, there are increasingly louder calls for a more coherent and transparent approach to food issues.

Functional Foods introduce new aspects in the food debate as they represent a new concept to food production: the alteration of the physical structure and the chemical composition of food products in order to achieve

particular effects to body functions. In many cases these alterations constitute a development on the borderline between food and medicines, which requires new ways of thinking about daily food intake. In these early days of the debate one finds considerable optimism amongst supporters of such developments suggesting that "... in addition to satisfying individual consumer needs for healthy food ... (functional foods) will contribute to a reduction in food-related illnesses and, seen from the point of view of society as a whole, will have overall positive effects on health policy and the economy in general." (TAB, 1999). But not everyone shares that optimism and the increasing use of biotechnological processes to produce Functional Foods has already been dubbed by some as 'the next generation of Frankenfoods' (Corporate watch, 2000), thus, reviving the highly contentious debate in Europe on genetically modified foods in the market. In line with these issues the socio-political implications of Functional Food developments require particular attention and detailed assessment.

The central question then is whether functional foods represent the most appropriate response to the situation as outlined. Although foods have long been consumed for reasons over and above nutrition, e.g. for social bonding, to what extent is it desirable that they take on a quasi-medicinal aspect? Is it possible to be clear, conceptually, about the difference?

The project is designed as an expert interdisciplinary programme that will analyse the consequences of the emergence of functional foods in: individual health (cardiovascular diseases, cancer, etc.), national health programmes (health care costs, productivity, etc.), food industry (food manufacturing, retailing, pricing, etc.), regulations (precautionary principle, health claims, labelling, etc.), public perceptions (risk evaluations, attitudes, etc.) and normative questions (acceptability criteria, food naturalness, etc.).

### *1.5.2 Work programme*

The main work of the project consists of elaborating scientific findings through interdisciplinary discussions within the project team and in regu-

lar contact with relevant scientific communities. The project work has been divided into four main phases:

Pre-phase, January 2001 – May 2001: Setting the work plan

There was a Kick-off Meeting in January 2001 where the project team was constituted followed by two additional meetings where the project work was worked out in detail. The participants offered a critical evaluation of the state-of-the-art in their particular discipline in relation to the issue and identified research themes for further discussion and elaboration.

Main-phase 1, June 2001 – April 2002: Preparing the ‘seeding texts’

During this phase, the project team put the work plan into effect by distributing thematic responsibilities amongst the members. Following that, the members produced “seeding texts” which formed the basis of interdisciplinary discussions towards a working text.

Main-phase 2, May 2002 – December 2002: Mid-term Meeting and the final report

The individual papers created as “seeding texts” were discussed at a scientific workshop in June 2002 with outside experts acting as reviewers. Reviewers were:

*Professor Peter J. Aggett*

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*Professor Werner Grunow*

Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin, Germany

*Professor Dr. Hannes Weindlmaier*

Technische Universität München, Germany

*Professor Klaus G. Grunert*

The Aarhus School of Business, Denmark

*Professor Dr. Michiel Korthals*

Wageningen University and Research centre, The Netherlands

*Professor Ian Rowland*  
University of Ulster, UK

Following the reviewing process of the conference, the papers will be finalised into common text according to the principle of consensus. That will include specific recommendations targeting policy making institutes at the international level. The finalised text will then be presented to the Scientific Advisory Board of the Europäische Akademie for approval before entering publication and dissemination processes.

### *1.5.3 Results*

Following the approval by the Scientific Council of the Akademie, the results of the project work will be published as an academic book and presented to interested political institutions and members of the specialist public. The presentation phase is official in nature and may be repeated according to need. The results will also be disseminated through publications and lectures of individual project members.

### *1.5.4 Project Members*

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*Professor Bevan Moseley OBE, BSc, PhD*  
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## **1.6 Embryo Research in Pluralistic Europe (Duration: 1/01–12/02) (Embryonenforschung in Europa)**

### *1.6.1 Background and Tasks*

During the last few years new technologies have been developed that allow us to culture and manipulate human embryonic cells for medical purposes like for example preimplantation diagnosis or research on human stem cells aiming at developing new therapies.

These new techniques that have been made available along with the development of Invitro Fertilisation (IVF) have stimulated a controversial debate for what aims and to what extent experiments on human embryos are morally acceptable. Though there is a general consensus among scien-

tists and among the general public that human embryos deserve greater respect than embryos of other species, a consensus on appropriate regulations on research on human embryos has not yet been reached.

In view of the already established international scientific co-operation and not least the project of harmonisation of the European Union it becomes obvious that these questions cannot be dealt with solely on a national level. Rather the current national regulative diversity has to be faced and the question has to be dealt with as to whether harmonisation of the different national laws regulating embryo research related questions is possible and desirable, or indeed perhaps necessary.

The project therefore particularly takes into account questions of how embryo experiments and similar biomedical research and practice should be dealt with on an international respectively supranational European level. Besides the relevant biomedical and clinical aspects also aspects that result from the given different legal, social and moral backgrounds within the different European countries are taken into account and discussed as thoroughly as possible.

### *1.6.2 Working method*

After the first phase of the project (the so-called ‘Vorprojekt-Phase’), based on the results of an expert meeting (‘Fachgespräch’) held in June 2000, the project group’s first meeting took place at the Europäische Akademie in Bad Neuenahr-Ahrweiler in January 2002. The members of the project group are experts in various scientific fields which are particularly connected to embryo research related questions, like embryology, immunobiology and biotechnology, medical and international law, sociology, and philosophical ethics and philosophy of law.

Up till now the project group has had ten regular meetings plus two extra meetings of the legal experts for the discussion of particular juridical questions. At the first project meeting of the group at the Europäische Akademie from 23.–24.01.01, some first drafts (so-called ‘seed texts’) and a detailed working programme for the project were discussed.

To gain further expertise for the project, the second meeting of the group was designed as a so-called Kick-off Meeting. It took place at the Max-Delbrück-Centre in Berlin-Buch from 11.–12.05.01. Lectures on different related topics were given by Professor Dr. Mirentxu Corcoy, Barcelona/Navarra, Professor Dr. Hans Lehrach, Berlin, and Professor Dr. Bettina Schöne-Seifert, Zurich/now: Münster. Further participants were: Professor Dr. Detlev Ganten, Professor Dr. Ferdinand Hucho, Professor Dr. Jens Reich, Dr. Christoph Tannert, all Berlin, Dr. Michael Selgelid, LaJolla/now: Witwatersrand, and Dr. Gregor Zünd, Zurich.

Based on the Kick-off Meeting's discussions and the first drafts of the chapters the aims and the division of tasks regarding the preparation of the chapters of the report were decided on in a third meeting, which took place in Bad Neuenahr-Ahrweiler from 3.–4.08.01.

In a fourth meeting of the projectgroup in Bad Neuenahr-Ahrweiler from 20.–21.10.01 two further experts were invited to give lectures on further relevant clinical aspects: Dr. Peter Braude, Division of Women's and Children's Health Guy's, King's and St Thomas' School of Medicine, London gave a lecture on "PGD and embryo research/human developmental biology in clinical practice". Privat-Dozent Dr. Ulrich Martin, Leibniz Research Labs for Biotechnology and Artificial Organs gave a presentation on "Embryonic stem cells and therapeutic cloning: relevance for transplantation medicine". Dr. Martin has been appointed as member of the project group.

The fifth meeting of the project group took place at the Berlin Brandenburgische Akademie der Wissenschaften from 8.–9.12.01. Professor Dr. Barbara Knowles, Director of Research of The Jackson Laboratory, Maine USA was invited as guest of the group and gave a presentation on "The Recent Developments in the Cloning Debate in the United States". Besides her talk the further development of the various drafts prepared by the project group members was discussed.

The sixth meeting of the project group took place at the Novartis Foundation in London from 9.–10.03.02. Besides the recent development of the drafts Professor Dr. Robin Lovell-Badge, in his capacity as a member

of the advisory of the House of Lords and the House of Commons, gave an introductory talk on “The House of Lords’ Recent Debate on Stem Cell Research”. Professor Dr. Hans Lilie, in his capacity as member of the UN-Committee gave a talk on the first proceedings of the “Anti-Cloning Resolution of the 6<sup>th</sup> Committee of the United Nations”.

The seventh meeting took place at the Berlin Brandenburgische Akademie from 24.–25.05.02. Since the chapter on regulation of embryo research on a European level was discussed in particular, Dr. David Fraser, research assistant to Professor Dr. Deryck Beylveveld, and Dr. Christoph Mandla, research assistant to Professor Dr. Hans Lilie, participated in the meeting. In the context of the discussion that took place, the inclusion of sociological expertise was decided.

To the next meeting, which took place at the University of Warsaw from 21.–22.09.02, Professor Dr. Rafael Pardo Avellaneda, Director of the BBVA Foundation Madrid / Bilbao was invited to give a lecture on “Public Opinion and Embryo Experimentation in Europe”. Professor Dr. Jacek Holówka gave an introductory talk on the current research situation in Poland. Professor Pardo has been appointed as member of the project group. He has been entrusted with the preparation of a chapter on the sociological problems of embryo research in Europe.

Towards the end of September the group finished the second phase of the project by preparing a provisional final report that was sent to various experts of the relevant scientific areas for review and comment. Professor Dr. Anne McLaren, Cambridge University, Professor Dr. Sheila McLean, University of Glasgow, Dr. Bernhard Böhm, Bundesministerium der Justiz, Baroness Mary Warnock, House of Lords, Professor Dr. Dieter Birnbacher, Universität Düsseldorf and Professor Dr. Julian Savulescu, Oxford University acted as reviewers of the provisional final report. Their comments were discussed with the group in a so-called Mid-term Meeting, which took place at the Novartis Foundation in London from 8.–9.11.02.

Following the Mid-term Meeting the members of the project group revised the chapters again with respect to its discussions. The changes

were discussed in a further meeting which took place at the BBVA Foundation in Madrid from 14.–15.12.02.

One further meeting is planned for April 2003 to include the chapter on the sociological dimensions of embryo research which will be based on a current survey on embryo research related questions in various European states.

### *1.6.3 Results*

Based on the provisional final report the following results can be formulated:

In view of the important medical improvements science is able to prospect today and the increasing number of supernumerous embryos resulting from IVF treatments that have no chance of being implanted, regulations need to be developed on the basis of sound scientific knowledge and of normative considerations, taking into account and balancing arguments as thoroughly as possible in the rather limited time-frame fast scientific progress provides. Only rationally founded regulations can reasonably be expected to be agreed upon throughout a pluralistic society like the European states. Regarding the latter German Aerospace Center (DLR), it is not possible, however, to make more than an educated guess about whether the announced scientific results are achievable by limiting research to only some of the possible medical-technical approaches. Therefore limiting research projects to research on adult stem cells only, as it is currently discussed, is unjustified in terms of scientific soundness. Claims that science is able to reach the same aims by other means than embryo research have to be regarded as inadequate – at least for the time being. A similar inaccuracy in the debate has to be acknowledged with regard to therapeutic and reproductive cloning. Their methods and aims need to be discussed in a more differentiated manner. Though data gained by the use of animal models give sufficiently good reasons to expect unacceptably high risks in reproductive cloning that lead to a rationally founded demand for a moratorium of research in this specific area, this

demand is hypothetical, not categorical, and the situation might change if new results were found in animal models.

Not only here, a philosophical analysis shows that many of the currently prevailing arguments that have been exchanged in the recent debates are based on rather strong metaphysical assumptions that do not have to be shared by everyone. Since these assumptions often cannot be supported by rationality, they do not qualify as an acceptable basis for political decisions in a pluralistic society. In pluralistic societies political decisions rather have to be designed in a way which allows people to accept their implementation even if they disagree with certain specific decisions on moral grounds. People in a pluralistic society might do this for overriding reasons – in particular in acknowledgement of procedural solutions reached by institutions, especially such solutions designed to maximise accountability, transparency and reviewability. Such an approach would not necessarily mean that cultural and moral sensibilities would have to be put aside but would rather also be able to respond to the needs that might result from specific national experiences and cultural requirements. Neglecting national sensibilities indeed would make the successful implementation of biomedical regulations impossible and might perhaps even put the process of European political unification unnecessarily at risk.

However, according to the analysis of the project's findings, the harmonisation of policies on embryo research is a very likely though not necessarily certain outcome of the general European harmonisation and the increasing internationalisation of research and medical practice.

For the time being it might be the best political solution to accept national diversity in morally influenced legal regulations like the regulations on embryo research. A more important and currently more pressing requirement is that these national regulations contain adequate safeguards against conflicts of interests and corruption and that adequate institutions are established to control the realisation of these aims. Such institutions preferably might, but do not necessarily have to, work on a European level.

Reference

Friele, M B (ed) *Embryo Experimentation in Europe. Bio-medical, Legal, and Philosophical Aspects*, “Graue Reihe” no. 24, Europäische Akademie, Bad Neuenahr-Ahrweiler

Selgelid, M J, *Societal Decision Making and the New Eugenics*, “Graue Reihe” no. 30, Europäische Akademie, Bad Neuenahr-Ahrweiler

*1.6.4 Project Members*

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**1.7 Environmental Standards. Low Dose Effect Relations and their Risk Evaluation (Duration: 1/01–6/03)  
(Umweltstandards. Dosiswirkungsbeziehungen im niedrigen Dosisbereich und Risikobeurteilung)**

*1.7.1 Background and Tasks*

Various natural processes, technological development and the increase of population density are accompanied by the release of toxic agents of physical and chemical nature into the environment. This development has led to increasing exposures to all living organisms including humans. Therefore it has become necessary to limit these exposures and to develop certain protection measures for the environment and living organisms. Such processes have to be based on scientific knowledge about the effects of these agents especially on human health as one of the most important criteria.

However, it has also turned out that in many situations probably no complete protection is possible, some risk will occur even in the range of very low exposures although this is usually not measurable. In order to obtain an estimate of the risk in the low dose range, the shape of the dose effect curve is decisive for the estimation of risk and the procedure of setting dose limits.

Experimental analysis and epidemiological surveys have always proved relatively sound data for the effects of exposures in the high and medium dose range. But regarding low doses which play an essential role in the debate on risk for environmental and industrial safety, important uncertainties still exist. These dose ranges are situated below experimentally

measurable values; possible effects are therefore extrapolated from high and middle dose ranges into the range of low doses. This complicates the construction and interpretation of dose-response models in order to set standards. Within the scope of the project, both the scientific foundations on which dose-effect curves are based and the problems as well as uncertainties of setting standards should be comprehensively described and discussed.

The limitation of releases from technical and natural sources should, as far as possible, be cost-effective for society in general. Therefore the question arises which risks can be accepted by society in general and by individuals in specific cases. This makes an interdisciplinary investigation of these questions necessary in order to examine the scientific, medical, socio-psychological, legal and philosophical aspects. The necessity, realisability and the consequences of these procedures will be discussed in the project group. Furthermore, recommendations for research requirements and for implementation rules that may be useful for environmental and research policy should be developed. In this context, the international situation with a special focus on Europe will be taken into account.

### *1.7.2 Method*

During a period of two years the Europäische Akademie's project group "Environmental standards. Dose-effect relations in the low dose range and their risk evaluation" examines this problem in an interdisciplinary work for politics and research.

After a preliminary project phase the constituent assembly of the project group took place in Bad Neuenahr-Ahrweiler from 17.–18.1.01. The group consists of recognised experts, who, from their own scientific background, are able to present the different aspects of radiobiology, toxicology, modelling, epidemiology, psycho-social science, philosophy, law and economy related to the problem of low dose exposure. In an interdisciplinary effort these different disciplines will be all linked together to evaluate the standard setting process in the low dose range.

In seven working meetings of the project group in Bad Neuenahr-Ahrweiler in 2001 and 2002, in which there have been a few personnel changes, it has been possible to clearly define the tasks and the future structure of the memorandum and to present and discuss all drafts written by the project group members.

Drafts concerned the following different disciplines: radiobiology “Effects of ionising radiation in the low dose range – radiobiological basis”, toxicology “Toxicology of chemical carcinogens”, epidemiology “Epidemiological perspectives on low dose exposure to human carcinogens”, modelling “Mathematical models of carcinogenesis and low-dose risk estimation”, Ethics “Ethical aspects of risk”, Philosophy of science “Hypothesis testing and the choice of the dose-response model”, Psycho-social sciences “Risk evaluation and communication” and law “Low doses in health-related environmental law”. Besides the discussion of the drafts most of the project group members presented themselves with an introductory lecture of their own discipline: “Introduction to low dose response relationships and tolerance distribution. Mechanistic explanations of J-shaped dose response curves” by Professor Dr. W. Lutz, “Effects of ionising radiation in the low dose range – radiobiological basis of carcinogenesis” by Professor Dr. Dr. C. Streffer, “Ethical issues for rational choices” by Professor D. Føllesdal, “Ethical evaluation of radiological risk” by Professor Dr. Deborah Oughton, “Modelling of carcinogenic processes and shape of dose-response models with special consideration of the two-step clonal expansion model” by Dr. P. Jacob, “Hygiene-based margin of safety (HBMOS) – for the assessment of the impact of potential endocrine disruptors like environmental estrogens” by Professor Dr. Dr. H. Bolt, “In vitro human hepatocytes. A model for the assessment of cancerogenic compounds” by Priv.-Doz. Dr. J.-G. Hengstler.

A meeting at the Institute for Occupational Physiology in Dortmund on 15<sup>th</sup> July 2002 served to discuss special issues in toxicology and radiobiology in a smaller scope. These meetings allowed the group to prepare a first bundle of drafts of the whole project which was discussed at a meeting at the Karolinska Institute in Stockholm from 19<sup>th</sup> to 20<sup>th</sup> August

2002. This collection of drafts has been the basis for the mid-term review process.

The project group's Mid-term Meeting took place in Bad Neuenahr-Ahrweiler on 12<sup>th</sup> and 13<sup>th</sup> September 2002. The meeting served to discuss the problem involved with extrapolation from high to low doses in a broader interdisciplinary expert panel. The meeting emphasised the sound scientific content of the presented drafts and gave valuable comments on the results obtained by the group until now. Suggestions concerned, for example, a more in depth discussion of the pros and cons in the scientific controversy on dose-response models as well as the standardisation of the style and the integration of the different parts of the future report. Reviews were given by Professor Dr. Maria Blettner (University of Bielefeld), Professor Dr. Monika Böhm (University of Marburg, written comment), Professor Dr. J. Philip Day (University of Manchester), Professor Dr. Anne Fagot-Largeault (Collège de France), Professor Dr. Ludwig Feinendegen (Lindau), Professor Dr. Bernd Hansjuergens (UFZ Centre for Environmental Research Leipzig), Professor Dr. Dr. Bernhard Irrgang (Technical University Dresden), Professor Dr. Georg F. Kahl (University Goettingen), Professor Dr. Jos Kleinjans (University of Maastricht), Professor Dr. Wolfgang Köck (UFZ Centre for Environmental Research Leipzig), Professor Dr. Suresh H. Moolgavkar (Fred Hutchinson Cancer Research Center, Seattle), Dipl.-Päd. Holger Schütz (Research Centre Jülich).

In the following months the project group will refine the memorandum, integrating as much as possible of the feed back of this meeting and work out recommendations for politics and science.

### *1.7.3 Results*

The work is still in progress. The results presented here just reflect a selection of some aspects of the actual debate of the group.

Scientific principles and mechanisms which are the basis for dose-effect-curves as well as methods of extrapolation are treated and illustrated by

well chosen examples in order to describe the extent of uncertainties. In this context, the effects of ionising radiation as well as of selected toxic substances are taken into consideration. The characteristics of the low dose range are different after exposure to ionising radiation or to genotoxic substances. Depending on the quality of ionising radiation (i.e low or high LET) even in the low dose range the dose to a single cell can be appreciable while very few or even only one event can occur in a single cell with genotoxic substances. Therefore the exposure patterns will be different for these agents.

The main focus of the project work is set on irreversible genotoxic i.e.(carcinogenic and mutagenic) substances for which there is a particularly manifest potential of social concern. Changes in the DNA are apparently the most important initial step for the above mentioned late effects. For these cases it is generally assumed that the DNA damage in one cell is sufficient in order to initiate and develop the effect and therefore it is assumed that probably no threshold dose exists. To which extent this can be proven from the established scientific data is discussed in the project group and will be presented in the final report.

Besides age and gender, genetic predisposition with DNA repair deficiencies, the degree of genomic instability and changes in the regulation of the cell proliferation can alter the individual sensitivity to a genotoxic agent with respect to the development of mutations, cancers and developmental defects. Arguments for taking into account an average risk as well as for taking into account risk groups are discussed. On the basis of the experimental and epidemiological data modelling systems are used to better understand possible effects and the connected mechanisms from the processes of exposures through the various developing steps until the expression of the biological damage in the low and very low dose. With such models, it should be possible to analyse the influence of the various steps such as initiation and promotion on carcinogenesis. This will be essential for the evaluation of critical systems and estimates of quantifying risks in the low dose range. It is however necessary to assess existing models for their strengths and shortcomings, hence different models and their theoretical or experimental background are explained and evaluated.

For instance, differences in susceptibility, reversible vs. irreversible effects, unicellular vs. multi-cellular effects will have an influence on the model used.

Considering different exposure contexts and risk populations will influence rational reflections on human and environmental health. In this context, principles of the concept, the perception and the understanding of risks are discussed, both from the view of applied ethics and psychosocial sciences. Translating the results of risk assessments so they can be understood is a challenge. However, it has been shown that even the well-informed public still keeps “irrational” fears. So the question arises as to whether, which and to what extent risk comparisons represent suitable instruments in risk communication and acceptance. Hence, it is an open question whether seeking for broad consensus will be possible or must be achieved, as people experience risks in different manners and different levels of acceptable risks might be valid for different actors (individuals vs. society).

The setting of limit values has a strong economic impact. Slight tightening up of limit values might require high investments for industry to conform to legislation. The principle of relativity is challenged by economic actors when it comes to the question of acceptance of residual risk levels. In the case of applying non-threshold dose-effect models, the risks which are to be reduced by applying relevant standards represent an artificial limit governed by more or less rational choices, but allowing some residual risk to persist which is bound to be different for each individual according to susceptibility. For practical reasons, individual susceptibility cannot be fully accommodated in German law; however it shall be discussed to what extent constitutional requirements and environmental laws mandate the consideration of “vulnerable groups” and give directions as to the shaping of these groups. In view of uncertainty the conventional risk assessment model and its treatment of scientific uncertainty will be analysed from a legal point of view and possible improvements discussed. The international situation, especially in Europe, with its increasing reliance on the precautionary principle, as well as different national approaches to the protection of humans and their environment is included.

*1.7.4 Members*

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## **1.8 Technology Assessment in Europe: between Method and Impact (TAMI) (Duration: 1/02–12/03)**

### *1.8.1 Background and Tasks*

The main objective of the two-year EU-project TAMI is to create and promote a structured dialogue within the Technology Assessment (TA) community as well as between TA experts and policy makers with the aim of improving the effect of TA in Science and Technology (S&T) policy.

TA in Europe has evolved significantly in recent years by experimenting in and developing new methods of assessing scientific and technological innovations beyond the “classical” expert-oriented approaches. The new methodological variety has created a debate as to the merits and disadvantages of each method which is still far from being conclusive. At the same time, there is a significant change in the manner by which policy is made in the area of S&T. Partly as a result of recent social debates on the consequences of scientific discoveries and partly as a result of the need to modernise policy structures in the area of S&T, there is considerable discussion on the way science and policy intermingle in the public arena (e.g. the issue of ‘science governance’). Part of this debate refers to scientific advice in policy-making and ways in which this relationship can improve and become more comprehensive.

It is in this context that this project aspires to function and provide some concrete contributions to the debate. TAMI involves a group of leading TA experts from major European institutes who will have the chance to discuss core-issues in European TA. Such exchange will provide the unique opportunity to exchange information and knowledge gathered through many years of European TA and put them into practical use.

In detail, the objectives of the project are:

- Review and evaluation of the state-of-the-art of methodologies and practices used in current European TA. This is necessary for the creation of an information basis for the development of the struc-

tured dialogue. It refers to an on-going debate in the TA community that is constantly renewing itself with new paradigms and ideas.

- Review and evaluation of impact assessment exercises that have been undertaken by European TA institutes. Similar to the previous objective, this is a preliminary step for the preparation of the ensuing dialogue. It constitutes a new endeavour in European TA since so far there has not been any attempt to collate and evaluate impact assessment processes in TA.
- Resulting from the first two objectives, the next step will be the comparative evaluation between method and impact in TA whenever the documentation is comprehensive enough to allow for such endeavour. This also represents the first part of the dialogue that includes two of the main dimensions (Method-Impact) of the attempted common reference system.
- Comparative review of major European S&T policy structures. Taking as an example major European policy cultures, this part will discuss the dimension of Policy in the reference system within the European context.
- Identification of “best practices” in TA that maximise impact relative to the policy needs. This will be the first attempt towards the reference system by attempting to map methodological practices in relation to specific policy requirements.
- Creation of a common reference system around the dimensions Method, Impact and Policy. This is envisaged as a major outcome of the project as it involves the combination of the three main pillars represented by the three groups (two expert groups and policy makers) in the process of the structured dialogue.
- Dissemination of project results. This will be realised in several manners: on the one hand, the project reports will be public, allowing for internet access for every interested party, and on the other hand, there will be a main conference at the end of the project, presenting the con-

clusions to all interested parties and the public, allowing for wider contributions to the debate. In addition, project participants will also disseminate the results through their own professional networks in their own countries.

Explanatory note on the “common reference system”:

The concept of the “common reference system” refers to the combination of the three dimensions affecting the overall work of TA (i.e. Policy, Method and Impact). Method in itself cannot be considered irrespective of its Impact on Policy (and therefore, society as a whole), and Impact in turn, cannot be evaluated without reference to the actual Policy needs and requirements. The inter-dependence of the three dimensions in creating a meaningful and socially sustainable S&T strategy, necessitates their use in creating a common systemic thinking on S&T issues.

The “common reference system” represents a conceptual contribution, based on concrete facts and a structured “tripartite” dialogue between experts in TA Method and Impact, and Policy makers. Since TA itself is on the whole a relatively new endeavour in policy advice and some of its methods are still at the experimental stage, it would be improper to foresee definitive answers in the objective of the “common reference system”. What is envisaged is that, by developing for the first time a dialogue on these issues, there will be a common framework on which to map future TA activities or methodological experiments.

Summing up, the “common reference system” will aim at creating structure in the TA debate and the creation of a decision-making framework which can be used by policy makers and TA experts alike for more targeted and effective advice in the European S&T policy.

*1.8.2 Work Programme*

The TAMI work plan consists of seven work packages. They are tackled by two expert teams which are working in parallel cross-connected working groups (“Twin groups”). Following the initial constitutional meeting, involving mostly organisational matters, the main project has started with

a common plenary meeting (Kick-off Meeting) in which policymakers were asked to present their needs and TA-experts to describe the way to reach 'legitimation' of their results. In addition, industrial TA experts have been invited to participate in the debate. The discussion during this meeting focused on the differences between these standpoints, addressing questions such as what is the reason behind the failure of well-legitimised TA-results to become political decisions.

The next part of the project will be devoted to finding criteria to evaluate the impact of TA-results and to identify criteria to compare TA-Methods within different problem contexts. For this reason, experts are divided into two groups with different thematic responsibilities (i.e. Method and Impact). The groups work parallel, with provisional exchange sessions, exchanging information and generating knowledge towards the preparation of the first reporting, assessing the state-of-the-art and providing tentative thoughts.

The next step will be the second plenary meeting (Mid-term Meeting) which aims at scrutinising and discussing the results achieved so far. Again, policymakers and external experts are invited to put their statements on record. This is viewed as both an evaluation process as well as information exchange between creator (TA expert) and end-user (policy-maker).

The results of this discussion will be used by the two groups to review their work and develop it towards the final report. That will entail similar work-structure in parallel sessions with provisional exchange sessions. The final results will be presented and discussed at the dissemination conference with all participants, external experts and other interested parties.

The methodology used to achieve the objectives is the so-called "project group principle", which is a procedure to organise a structured dialogue between experts focussing on rationality. All experts have to justify their statements in a scientific manner as agreed in advance. They are asked to prepare a final report in common authorship, which means that they are in charge of all parts of the report. Because of this, the necessity for the

aforementioned detailed argumentation is underlined. The target of this procedure is to reach trans-subjective results. This is operationalised by the creation of “draft reports”. Every participant presents a draft report at the beginning of the project which describes in general his or her perspective on the problem. All participants commit themselves to develop these draft reports referring to the ongoing discussion in the project group. In this way, all draft reports become the product of all participants during the project and the common authorship is realisable.

Furthermore, the project group has to take into account the results from the external experts invited to the Kick-off and Mid-term Meetings which can be seen as a kind of evaluation process for the work in progress. Additionally, the common meetings of the two groups establish an evaluation process. At these common meetings the groups discuss their results achieved so far. The later evaluation process, in particular, scrutinises the transparent argumentation in the reports.

Both project groups aim to present concrete recommendations for action based on a comprehensive argumentation developed by all participants. By the above described procedure, i.e. the step-by-step development of the draft reports towards a combined final report in common authorship accompanied by several feedback sessions, the final report will reach a very high level of transparency in argumentation and realisability. It is therefore optimised for both direct realisation by policymakers and for further discussions on the topic.

Organising the project in two parallel expert groups is an advantage for several reasons. Smaller groups enhance active participation in such intensive discussions, since this is the level where the in-depth discussions take place. Additionally, the results are reviewed and evaluated by a larger group of experts during the joint meetings which represents the level for broader discussion. In this way management requirements are kept lower due to the higher flexibility of two small groups compared with a single large expert group.

### *1.8.3 Results*

The TAMI project started in January 2002. In detail the project consists of five main milestones which are shown in detail below:

- Project commencement: January 2002
- Kick-off Meeting: June 2002  
(Discussion with policy-makers, industrial TA and external experts)
- Mid-term Meeting: 4/5<sup>th</sup> April 2003, Prague  
(Second round of discussion with policy-makers, industrial TA and external experts)
- Dissemination conference: 27/28<sup>th</sup> November 2003, Brussels
- End of project: December 2003
- Book publication: March 2004  
(Main results of the two groups and the conclusion of the wider discussions will be published in a book)

In the first phase organisational details, such as group constitution, meeting dates etc, have been fixed. The first working meeting took place in the Parliamentary Office of Technology Assessment (POST) in London in February 2002. There a questionnaire for the external experts (policy-makers, experts from industry) of the Kick-off Meeting was prepared. The five key speakers, Professor Dr. Josef Bugl (Chair, Advisory Board CTA), Dr. Paraskevas Caracostas (European Commission), Dr. Hans Peter Bernhard (Novartis Services AG), Mr Andrew Freeman (GlaxoSmithKline) gave their statements to the following topics:

1. Expectations from TA institutes
2. Impact of TA in policy-making and criteria for success
3. Examples of influential reports
4. Problems in S&T policy where TA can contribute and ways to do that

## 5. Participation of experts, laypersons, citizens and/or stakeholders in TA

These expectations and comments will be the working basis for the following content work TAMI has to deal with. Therefore first draft papers have been prepared in the two groups.

The method group – consisting of Dr. Michael Decker, Professor Dr. Armin Grunwald, Dr. Danielle Bütschi, Mr Rainer Carius, Dr. Peter Machleidt, Mr Soeren Gram, Mr Stef Steyaert and Mr Rinie van East – discussed and agreed about a common European definition and quality criteria for TA. During the next meetings the group will go on working on a common reference system connecting special TA issues to recommended methods.

The impact group has started work with the discussion of the impact typology and the agreement of the further working structure. Papers on “evaluating public debates”, “organised interests”, the institutional context of TA ” and “framing cultural differences that affect impact assessment” have been prepared so far. The impact group consists of Dr. Miltos Liakopoulos, Dr. Leonard Hennen, Mr Lars Klüver, Dr. Sergio Bellucci, Professor Tomasz Szapiro, Dr. Luis Sanz, Dr. Laura Cruz, Dr. Theo Karapiperis, Mr Robby Berloznik, Mr Jan Staman and Professor David Cope.

The last working meeting in the year 2002 will be in Zurich in December. Both groups will finalise their common working structure and discuss in the cross-over meeting in February their first results.

### *1.8.4 TAMI Members*

TAMI is co-ordinated by the European Academy in Germany. The following institutions are TAMI members. Below all members are listed and shortly described:

- The Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen Bad Neuenahr-Ahrweiler GmbH (EA), Germany, is doing expert TA using the procedure “Project group principle”. It is an independent institution with responsibilities as

project co-ordinator and provides input in both groups TA-Methods (TM) and Impact Assessment (IA).

- The *Parliamentary Office of Science and Technology* (POST), UK, is doing TA as an integral part of the UK parliament. They are participating and collaborating in the co-ordination of the IA-group.
- The *Forschungszentrum Karlsruhe GmbH* (FZK), *Institute for Technology Assessment and System Analysis* (ITAS), Germany, is doing TA directly connected to the parliament via the TAB and they are doing research on methodology (expert TA). They participate in both groups.
- The *Academy for Technology Assessment in Baden Württemberg* (CTA), Germany, is doing parliamentary TA on the regional level and they are doing research on methodology (participatory TA). They are participating in the TM-group.
- The *Danish Board of Technology* (DBT), Denmark, is doing TA directly connected to the parliament and they are doing research on methodology (participatory and expert TA). They participate in both groups.
- The *Centre for Science and Technology Studies* (TA Centre), Switzerland, is doing TA directly connected to the parliament and they are doing research on methodology (participatory TA). They participate in both groups.
- The *Centre of Science, Technology and Society Studies at the Institute of Philosophy of the Academy of Sciences* (STSS Centre), Czech Republic, is doing TA as an independent institution. It participates in the TM-group.
- The *Warsaw School of Economics* (SGH), *Institute of Modern Civilization* (IPWC), Poland, is doing TA as an independent institution. It participates in the IA-group.
- The *Consejo Superior de Investigaciones Científicas* (CSIC), *SPRITE* (Spanish Policy Research on Innovation & Technology, Training and Education), Spain, is doing TA as an independent institution. It participates in the IA-group.

Additionally, the following institutes will also participate in the project albeit not as full members. They will be invited to TAMI meetings and will also be asked to contribute to the scientific outcome as external experts:

- The *Committee on Industry, External Trade, Research and Energy, European Parliament*, participates in the IA-group.
- The *Rathenau Institute*, The Netherlands, participates in both TM and IA-groups.
- The *Flemish Institute for Science and Technology Assessment (viWTA)*, Belgium, participates in both TM and IA-groups.

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## **2. Planned Project: European Social Policy (ESP) (Europäische Sozialpolitik)**

### **2.1 Background and Task**

Due to the enlargement of the European Union through the inclusion of new member states, the needs of coordination and harmonization of the institution and measures of social policy between the member states and between these and the legal and political actions at Union level will not only increase but become more complex too. The main reason for this is the widening of economic gaps and structural differences of the political and legal institutions of the social systems.

The project “European Social Policy (ESP)” focuses on the analysis of the needs of political measures in terms of available options of action and of

feasible objectives, that have to be put through in order to implement a sufficient level of international harmonization and integration. The different branches of the social system – welfare aid, social insurance, unemployment insurance, pension scheme, health insurance, etc. – have to be considered from this perspective of needs and opportunities of political action.

Of particular interest in this regard is the comparison of the setting of absolute or uniform versus relational standards of poverty or social need. Since national economic systems differ in regard to their level of economic development and accordingly to their capacity of financing social or welfare standards, in a context, where international individual migration and workforce mobility is guaranteed by law, questions on contribution duties and participation rights in competing social systems arise as well as discussions on how, by which community and to what degree equality has to be guaranteed. Here the conflicting relation between goals of social justice, on the one hand, and aims of economic efficiency, on the other, has to be evaluated. This analysis is even complicated by the fact, that beneath the more or less quantifiable objective conditions of the standard of living guaranteed by the social system in different countries, the differences in the sociopsychological perception and evaluation of these conditions has to be considered, too.

As far as legal aspects are concerned, not only international differences in institutions and regulations but also eventually conflicting competencies of the Union and the single member states are of interest, since rights established by Union laws are legally recoverable by the individual citizen against the single member state. Connected to this topic are questions on the enlargement of the competencies of the Union, originally founded as a mere economic and commercial Union, and the democratic legitimacy of this widening of competencies and of the political decisions following from it.

As these short considerations demonstrate, in order to thoroughly evaluate the topic “European Social Policy” an interdisciplinary approach is required, getting together representatives of the following disciplines:

law, economics, political science, sociology, socio-psychology, and philosophy.

## **2.2 Working Procedure**

The time frame of the project is divided into two project phases, preceded by a preparatory-phase. At present the project is in its preparatory phase, which will be concluded at the end of 2002. This phase includes five meetings with the last one still to be held in December. The duration of the two project phases is planned from January 2003 through December 2004. The first project phase will begin with the Kick-off Meeting in February 2003 and end with the Mid-term Meeting at the beginning of 2004. Accordingly the second project-phase will be concluded with the presentation of the final report at the end of 2004. Both project phases will cover from six to eight meetings, Kick-off, Mid-term and Final Meeting included.

The working method of the project group bases on the interdisciplinary composition of the group in combination with the principle of the collective authorship of the final report, which is meant to be the result of the transdisciplinary scientific discussion between and collaboration of the group members. The project work starts with a first draft of the main contents of the project theme and the determination of the relevant disciplines needed for the task: the scientific analysis of the topic on the one hand and the elaboration of rational recommendations for political action in the pertinent area on the other. With the individuation of the experts and the gradual enlargement and settlement of the actual project group over the first meetings the contents of the project theme get a clearer definition and a more detailed structure in accordance with the priorities set by the group members. Once the group is consolidated, the participants present seed papers focused on the perspective of their special discipline on the topic. Through the discussion of these papers in the group evidence of the relevant interconnections between the disciplinary viewpoints should be gained, which in turn should allow their integration on a transdisciplinary level.

During the project the single members of the group should scientifically expose, explain and justify their disciplinary perspectives in the reciprocal discussion and argumentation with the other disciplines aiming at the production of interdisciplinary and trans-subjective results, that can be put together in a text not only signed but also supported by all group members in collective authorship.

In order to give the group the opportunity to get an evaluation of the work in progress by external experts in form of their advice, critique and comments, twice during the project experts in the same disciplines as the project members and eventually in other relevant fields are invited to meet with the group for a discussion of the intermediate results. The Kick-off and the Mid-term Meeting serve this purpose of an evaluation and review process but at the same time give the group the possibility to get support from external experts by taking into account their judgement and arguments. In this sense, the two meetings are rather an occasional broadening of the group than a confrontation of the group with its reviewers.

At the final meeting, the project group presents the results of its work to the relevant target groups in the academic community as well as amongst the relevant political actors and representatives of the pertinent social institutions. This meeting serves the purpose of getting in direct contact with the addressees of the final report in order to enhance the dissemination and the understanding of its contents and to proof its scientific soundness in the light of external perception. The final report and the executive summary of its contents will be published in book form.

### **2.3 State of the Project**

The project ESP is still in the preparatory phase. After the introductory studies on the topic and the first search for experts put through within the Europäische Akademie, the first meeting took place at the Europäische Akademie in Ahrweiler on 19<sup>th</sup> March 2002, with the participation of Professor Dr. B. von Maydell (Max-Planck-Institut für ausländisches und internationales Sozialrecht, München), Professor Dr. E. Brähler (Univer-

sität Leipzig), Dr. F. Thiele and Dott. R. Leitner (both from the Europäische Akademie). Purposes of this first meeting were a first brainstorming on the main contents of the project theme on the one hand and the individuation of experts that could represent the relevant scientific disciplines.

The second meeting was held again at the Europäische Akademie in Ahrweiler on 13<sup>th</sup> May 2002. Participants were in addition to the participants at the first meeting: Professor Dr. C. F. Gethmann (Europäische Akademie), Professor Dr. J. Berghman (Katholieke Universiteit Leuven), Professor Dr. W. Lübbe (Universität Leipzig), Professor Dr. H. P. Widmaier (formerly Universität Regensburg), Professor Dr. M. Zukowski (University of Economics, Poznan). During the first part of this meeting the working method of project groups and the approach to interdisciplinary work of the Europäische Akademie were outlined to the participants. The second part was covered by an enlarged brainstorming and a first structuring of the contents, this time including the broader perspective of a higher number of disciplines. In addition an agreement on the first draft of the time schedule of the project has been fixed.

The third meeting in Ahrweiler on 8<sup>th</sup> July 2002 was focussed on contents. Unfortunately prior to this meeting Professor Dr. E. Brähler had to quit his collaboration with the group because of his intense involvement, following the academic elections, in the administration of the university of Leipzig. At the meeting Professor Dr. B. von Maydell and Professor Dr. H. P. Widmaier presented seed papers from the perspective of the legal sciences and economics, Professor Dr. J. Berghman and Professor Dr. M. Zukowski gave short presentations on the main aspects of the topic from the viewpoint of their disciplines: sociology and economics. Further participants were Professor Dr. W. Lübbe and Dott. R. Leitner. The discussion of the papers and presentations lead to the further definition and delimitation of the contents, the setting of priorities and – most important – a first structuring of the relevant interrelations between the single disciplines. Finally the size of the group and the necessary but still missing disciplines were agreed upon.

Before the fourth meeting it was decided to ask Professor Dr. H. P. Widmaier to elaborate his contribution in a separate paper, which the group

could eventually refer to in a later phase of the project. This method is going to be used also to gain other expertise eventually needed for the project work but not covered by any of the group members. The fourth meeting took place again in Ahrweiler on from 10<sup>th</sup>–11<sup>th</sup> November 2002 with two new participants: Professor Dr. T. Abel (Universität Bern) and Professor P.-L. Rauhala, PhD (Universities of Helsinki and Tartu). Seed papers were presented by Professor Dr. J. Berghman, Professor Dr. W. Lübbe, Professor P.-L. Rauhala, PhD and Professor Dr. M. Zukowski. The discussion of these contributions in connection with the ones presented at the previous meeting allowed a more detailed definition of the interdisciplinary contents the group should put the main focus on. A first draft of the detailed structure of the contents of the project work has been elaborated. Based upon these results the group decided to prepare a short paper, that summarises the so far presented and agreed upon contents not only from the perspectives of the single disciplines but also in regard to their transdisciplinary interrelations. This paper is going to constitute the basis for the discussion with the external experts at the Kick-off Meeting.

*Further steps:* The next and last meeting of the preparatory phase is going to be held in Ahrweiler on 13<sup>th</sup> December 2002. At this meeting Professor Dr. T. Abel and Professor Dr. B. Raffelhüschen (Universität Freiburg) will present their seed papers, which then will be integrated in the above mentioned text. Apart from this the purpose of the meeting is the fine tuning of the definitive version of the paper for the Kick-off Meeting, which is planned for the 24<sup>th</sup> and 25<sup>th</sup> February 2003.

## **2.4 Members**

Chair: *Professor Dr. Bernd Baron von Maydell*

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München (D)

*Professor Dr. Thomas Abel*

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*Professor Dr. Jos Berghman*

Faculteit Sociale Wetenschappen, Katholieke Universiteit Leuven (B)

*Professor Dr. Weyma Lübbe*

Institut für Philosophie, Universität Leipzig (D)

*Professor Dr. Raffelhüschen*

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### **3. Studies**

#### **3.1 Reasoning Goals of Climate Protection. Specification of art. 2 UNFCCC (Duration 5/02–11/02; plus editing phase)**

##### *3.1.1 Background and aims of the study*

“There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.” (3<sup>rd</sup> Assessment Report of the Intergovernmental Panel on Climate Change). The international climate policy has widely accepted the goal to prevent possible dangers from anthropogenic climate changes to the society and to the environment according to art. 2 of UN FCCC.

Despite significant progress in climate-related research and policy making, the meaning of the crucial term “danger” seems to be underestimated and vague, especially regarding possible and reasonable obligations for future climate protection. The finding of further concrete measures – which are necessary for the upcoming commitment periods of the Kyoto-Protocol – will need a sound base for adequate precaution and fair distribution of residual risks due to climate change.

The study is aimed at working out a reasonable and policy compatible methodology to formulate and propose acceptable goals of international climate protection. Moreover, recommendations for an improvement of normative measures may be expected, too.

This will be achieved by stocktaking and evaluation of relevant contemporary ethical theories, principles of environmental management and risk assessment as well as a critical analysis of the meaning and normative status of endangered environmental goods. The preliminary results will have to be assessed in terms of economical trade-offs and technological potentials, respectively. Finally, framing conditions from the actual political situation and choices for international conflict management will have to be reflected in order to strengthen the practical relevance of the final results.

This research is conducted on behalf of the “Umweltbundesamt” (UBA), Berlin. The registration no. is: 202 41 252.

### *3.1.2 Working Progress*

In March 2002 the Europäische Akademie participated in a partly open invitation to tender on the UBA research topic “Strategien zur Konkretisierung des Klimaschutzziels der Klimarahmenkonvention (Art. 2 UNFCCC) im Hinblick auf die 2. und die folgenden Verpflichtungsperioden des Kyoto-Protokolls”. At the end of April the UBA selected the submitted proposal of the Europäische Akademie right before the final end of the publishing phase of its report on “Klimavorhersage und Klimavorsorge”. Its presentation to the public in Berlin on 6<sup>th</sup> Mai 2002 gave the kick-off for this upcoming second climate study in the same moment,

which, therefore, might be seen as a follow-on study, as it may rely on the results of the preceding project. Consequently, some of its members were also nominated as experts for the new study project. The formulation of the preliminary outline of the study proved the need for contributions from further researchers, who subsequently joined the working group.

The main phase of the study was on the formulation, discussion and re-formulation of raw-texts to be implemented later-on and according to an extended outline. Beforehand, this outline was approved among the members of the working group and by responsible advisory representatives of the supporting UBA (P. Mahrenholz, P. Weiß). In late October 2002, the study team member Dr. Scheffran participated in the 8<sup>th</sup> Conference of the Parties event in New Delhi, where he gained valuable insights into the actual negotiation process and positions of actors from respective countries. This task was conducted with the help of a systematic interview process. Corresponding key questions were coordinated with the working group as well as with representatives of the UBA (P. Mahrenholz) and the Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (Dr. H. Kohl).

On the occasion of the 5<sup>th</sup> progress meeting (5/6 December 2002), a preliminary and yet incomplete report was discussed also with experts from outside the group. Professor Dr. A. Grunwald (Forschungszentrum Karlsruhe), Dr. G. Hanekamp (Europäische Akademie), Professor Dr. A. Hense (Universität Bonn), Professor Dr. C. Lumer (Universität Osnabrück), P. Mahrenholz (UBA, Berlin), Dr. B. Müller (Oxford Institute for Energy Studies) and Dr. S. Oberthür (ECOLOGIC e.V., Berlin) gave constructive inputs for the completion of work.

### *3.1.3 Results*

The results of this interdisciplinary effort will be based upon the recently published project report “Klimavorhersage und Klimavorsorge” (Schröder et al. 2002). They will give a scientific report, too; here dealing with the problem of the specification of objectives of international climate protection. The findings are therefore especially directed to climate poli-

tics. After having been evaluated by the supporting UBA, they will be also made available to the public as part of the book series “Wissenschaftsethik und Technikfolgenbeurteilung” by Springer (Berlin Heidelberg New York), due in 2003. Additionally, an executive summary will be widely distributed to interested parties.

#### *3.1.4 Publications*

Schröder M, Claussen M, Grunwald A, Hense A, Klepper G, Lingner S, Ott K, Schmitt D, Sprinz D (2002) Klimavorhersage und Klimavorsorge. Springer, Berlin Heidelberg New York

Schröder M, Claussen M, Grunwald A, Hense A, Klepper G, Lingner S, Ott K, Schmitt D, Sprinz D (2002) Climate Prediction and Precautions (Summary). “Graue Reihe” no. 23, Europäische Akademie, Bad Neuenahr-Ahrweiler

#### *3.1.5 Working Group Members*

*Professor Gernot Klepper, Ph. D.*

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*Dr. Stephan Lingner (co-ordination)*

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*Professor Dr. Konrad Ott*

Professorship “Umweltethik”, Universität Greifswald

*Achim Schäfer (research assistance)*

DUENE e.V., Greifswald

*Dr. Jürgen Scheffran (research assistance)*

Potsdam Institut für Klimafolgenforschung (Dept. “Global Change & Social Systems”)

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## **3.2 Miniaturization and New Materials**

### *3.2.1 Background and Task*

Nanotechnology is currently often referred to as the key technology of the 21<sup>st</sup> century. The potential of this technology influences nearly all areas of human life. Beyond the technically feasible, one finds exaggerated and even irresponsible promises in the public debate which arouse expectations in the political sphere that, in the foreseeable future, are only partly or even not at all realizable. This involves the danger of huge disappointment if certain aims cannot be reached, and also the risk that serious developments might be thrown into disrepute. The question arises whether the term “nano” is currently overstressed and often misused as a means for the procurement of research funding.

Within that context, one could be of the opinion that, in the sense of the remarks mentioned below, there are only a few very rare cases of real nano-“technology”. More precisely one should talk about nano-“science”. Behind the notion nanotechnology, one often finds nowadays the further development of already existing technologies to smaller structures without reaching a new kind of functionality. This is mainly due to the fact that the usual definitions of nanotechnology refer to the concrete size of structures. The German Federal Science and Education Ministry for example defines nanotechnology as dealing with production, investigation and application of functional structures with the dimensions of 100 nm and below. The changes of physical characteristics etc. are given only secondary importance. In the view of many noted scientists, for example, the term nano-materials strictly implies that the essential feature of these materials is their nano-scale size. Therefore, in this respect, a more precise definition shall be one of the aims of this project. For this a two-dimensional matrix is necessary to collate the change of physical phe-

nomena with the range of size in which these changes takes place. Obviously, this will lead to a descriptive definition of nanotechnology, not in terms of concrete numbers but referring to physical, chemical effects. The project aims at developing such a matrix.

Behind the USA and Japan, Germany spends the largest amount of money on nanotechnology. Other European countries have also allocated research funding for nanotechnology. Moreover, the European Commission also focussed on nanotechnology in it's sixth framework programme. This makes it sensible to compare the various political strategies concerning this financial support, including a comparison of the different endeavours of Technology Assessment accompanying the development of nanotechnology.

The project aims at evaluating the feasibility of the definition of nanotechnology based on the above mentioned matrix by discussing it with leading international experts of nanotechnology research. For this purpose, a workshop will be organised to take place in parallel with the international Nanoscience & Technology Conference in Groningen, The Netherlands (18<sup>th</sup>–21<sup>st</sup> May 2003).

The project goes back to the earlier “new materials” project of the Europäische Akademie published 1999. The project starts approximately in January 2003 and ends in June 2003.

### *3.2.2 Working Group Members*

The following experts are members of the core group:

Chair: *Professor Dr. Günter Schmid*

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*Professor Dr. Holger Ernst*

Lehrstuhl für Betriebswirtschaftslehre, WHU-Koblenz

*Professor Dr. Harald Fuchs*

Physikalisches Institut, Universität Münster

*Professor Dr. Heinrich Hofmann*

Laboratoire de Technologie des Poudres, EPFL Lausanne

*Professor Dr. Armin Grünwald*

Institut für Technikfolgenabschätzung und Systemanalyse FZ Karlsruhe

*Dr. Werner Grünwald*

Robert Bosch GmbH, Stuttgart

*Dr. Marcel Mayor*

Institut für Nanotechnologie, FZ Karlsruhe

*Professor Dr. Ulrich Simon*

Institut für Anorganische Chemie, RWTH Aachen

The project group will be completed after the preparatory project.

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## **4 Study Group: Practical Philosophy**

The Europäische Akademie is concerned with the scientific study of consequences of mid- and long-term processes that are especially influenced by natural- and engineering sciences and the medical disciplines. Its aim is to assist in preparing political decisions with contributions from the scientific point of view. The project groups set up for this purpose argumentatively identify and recommend those options that would be chosen rational acting individuals and collectives. Argumentations like this depend necessarily on some normative premises: e.g. the supposed standards of rationality, the adequacy criteria for the reconstructive shaping of decision scenarios and, last but not least, general principles for action, that would be chosen (according to one or another set of standards) by rational actors.

Such standards, criteria and principles have always been a subject of Philosophy, especially in such disciplines as the theory of argumentation (logic), the philosophy of science and ethics. The study group “Practical

Philosophy” will critically discuss these traditions as well as relevant contemporary philosophical debates and incorporate its results into the work of the Europäische Akademie.

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## **III. Perspectives**

### **1. Scientific Strategy**

In the coming years, it will be a matter of continuing to pursue the chosen path, to consolidate the competence attained in the work already accomplished by the project groups and to open up new fields of competence. The future core competence fields of the Europäische Akademie will be:

#### 1. In the methodology field:

- To establish more precisely the concept of Technology Assessment, both from the theoretical and the practical point of view, including the conceptual debate on other modes of approach, in particular that of participatory Technology Assessment;
- To conduct ethical reflections on the problems in the technical and medical spheres as well as the provision of the necessary methodological means. Analyses and reconstructions on the principles of interdisciplinary working methods.

#### 2. In the subject field, the future (and in part already present) topic areas of the Europäische Akademie will be:

- Circumspective ways of working in the fields of environment, climate and technology;
- The social challenge of the modern biosciences;
- New developments in the field of medicine and their consequences for society;
- Rational organisation of the information society.

## 2. Project Drafts

### 2.1 Organ Trade

In 1997 a new law regulating the transplantation of organs was enacted in Germany. This law improved legal certainty in the field of transplantation medicine, but did not help in decreasing the striking shortage of organs for transplantation. Especially with regard to kidneys, the number of new entries on the waiting list exceeds the number of organ transplantations by at least a thousand. Now, as ever, it seems that the (still unsuccessful) political strategy for making organs available is to foster altruism and charity. On this background the concept of ‘organ trade’ may be given a wide definition, covering all material incentives for a person to make his or her own organs available for transplantation. A list of incentives is given in the following – in the order of likely acceptance by the public.

1. the permission to restrict, in case of posthumous organ-donation, the group of recipients to those that themselves are registered as organ-donors. This would guarantee a certain reciprocity that may increase the willingness for organ-donation.
2. the payment of expense allowances to the families of posthumous organ-donors.
3. the payment of a monthly bonus or a reduction of sickness fund premiums for holders of an organ-donation pass.
4. the purchase of kidneys from living donors by sickness funds.
5. the right for individuals with kidney failure to buy themselves a kidney from a living donor.
6. the purchase of kidneys from living donors from abroad.

In the literature on medical ethics there has been an extensive discussion on the ethical problems of organ trade for more than a decade. An interdisciplinary project on this matter would have to reconsider medical,

philosophical, economical, political and legal aspects. A short list of problems:

- Do humans have the right of ownership concerning their organs?
- How can it be established, whether organ donation by a living donor was voluntarily?
- From which social classes would the organ donors come and should society have reservations against this?
- Would organ-purchase in developing countries be a new type of exploitation or the mobilisation of comparative advantages?
- How should this and other reservations be weighed against the death of hundreds of people on the waiting list?

The following experts are members of the core group:

*Professor Dr. Carl Friedrich Gethmann*

Europäische Akademie, Bad Neuenahr-Ahrweiler

*Professor Friedrich Breyer*

Universität Konstanz

*Professor Peter Neuhaus*

Virchow-Klinikum, Berlin

*Professor Jochen Taupitz*

Universität Mannheim

This project idea will be further developed during an expert-meeting in 2003.

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## **2.2 Intervening in Psychic Capacities. Neuroscience, Pharmacology, and the Medicalisation of New Spheres of Life**

### *2.2.1 Background and Task*

Recent developments in the neurosciences greatly broadened the understanding of the brain functions and the possibility to manipulate those

functions. New techniques such as functional magnetic resonance imaging (fMRI) and new psychopharmacological treatments as well as tissue, stem cell- and other types of implants, may soon allow us to screen and to “fix” psychic capacities on demand. Besides the widely welcomed prospects of a better treatment for many mental disorders, this development leads to a crucial challenge of some of the very fundamental concepts of human self-image such as individuality and autonomy.

Given that the demographic change, partly due to a prolonged life expectancy, will presumably lead to an increased incidence of age related psychic disorders, such as some forms of dementia and depression, and since the existing treatments of these diseases are insufficient, there is an increasing demand for the development of new therapies. But besides obvious medically indicated interventions, i.e. psychopharmacological or neurological support, there seems to be also an increasing demand for rather discretionary enhancement of psychic capacities.

The current development of techniques for the examination of and the intervention in psychic capacities calls for a thorough analysis of the conceptual frames that are used in the description and evaluation of the physical basis of psychic capacities. To the extent to which powerful procedures for interventions in psychic capacities are available, questions related to potential addiction problems and in particular with regard to an infringement of a person’s individuality and autonomy, have to be faced. Since there seems to be a higher potential for an abuse of psychotropic drugs than with other types of drugs, adequate regulations for controlling the clinical application have to be worked out further along the neuroscientific and pharmacological progress.

Additional problems occur with regard to the research conducted in many neurological and psychological fields. Patients in borderline situations, younger children, and older patients suffering from dementia may often be limited in their capacities to give informed consent. Their particular situation leads to a tension between the need for scientifically valid trials of new psychoactive treatments and concerns about conducting pharmacological trials with more or less severely incompetent patients. Given the

need for the development of a better medical treatment for this group of patients, possible strategies of an appropriate moral evaluation and legal regulation of research as well as clinical application have to be discussed on a sound scientific and normatively acceptable basis.

### *2.2.2 Working Procedure*

The project is still in the preparatory phase. After the introductory studies on the topic and the initial search for experts conducted within the Europäische Akademie, the first meeting will be taking place in an interdisciplinary European workshop from 8<sup>th</sup>-9<sup>th</sup> April 2003.

The workshop will bring together experts from neuroscience, psychology and pharmacology, philosophy and law with a special interest in the recent development in the neurosciences, psychopharmacology and in its philosophical and legal implications.

Over and above summarising the debates of the recent development in the mentioned areas, the workshop wants to be a platform for an interdisciplinary discussion of the conceptual frames that are used in the description and evaluation of the physical basis of psychic capacities. It aims at providing first indications of how scientifically acceptable regulations of the research and the clinical application of pharmacological and other interventions in psychic capacities can be generated on a European level.

The proceedings of the workshop will be published as a volume of the "Graue Reihe" edited by the Europäische Akademie GmbH.

The workshop will tackle the described questions in three sections:

#### A) Neurosciences/Medicine

The neuroscientific basis of psychic states and possible strategies of intervention and the "need" for interventions into psychic capacities; including an evaluation of the therapy/enhancement differentiation will be discussed.

#### B) Philosophy

The conceptual frames for the description and evaluation of interventions

into psychic capacities and the ethical implications of neurological interventions in research and clinical practice will be considered.

### C) Legal Aspects

A survey of existing regulations on interventions into psychic capacities including an assessment of the possible need for further regulation in relation to informed consent procedures will be given.

#### 2.2.3 Participants

*Professor Hans-Werner Bothe*

University of Münster

*Professor Dr. Carlos Romeo Casabona*

University de Deusto, Bilbao

*Professor Dr. Bill Fulford*

University of Warwick/Oxford University

*Priv.-Doz. Dr. Dirk Hartmann*

University of Essen

*Professor Dr. Reinhard Merkel*

University of Hamburg

*Professor Dr. med. Dr. h.c. mult. Madjid Samii*

International Neuroscience Institute, Hanover (to be confirmed)

*Professor Dr. Julian Savulescu*

Oxford University

*Professor Dr. Otmar Wiestler*

Institute for Neuropathology, University of Bonn (to be confirmed)

*Professor Dr. Peteris Zilgalvis*

Council of Europe, Strasbourg

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## **2.3 Pharmacogenomics**

### *2.3.1 Background and Task*

The term ‚pharmacogenomics‘ means the intersection of pharmaceuticals and genetics. Pharmacogenomics is the study of how an individual’s genetic inheritance affects the body’s response to drugs. The aim is to make drugs which are adapted to the individual genetic make-up. Knowing the genetical make-up can be the key to create individual drugs. Physicians have known for a long time that reactions to drugs may vary, but the genetical implication is a new one. The basis for this is the knowledge of polymorphisms

With pharmacogenomics medicine will be more powerful and more effective. Pharmacy will be able to create drugs based on the proteins, enzymes, and RNA molecules associated with genes and diseases. The therapy will be more targeted to the specific disease and to the individual person. Before physicians decide on a therapy, they have to know the genetical makeup of the patient. This therapy might be safer for the patient, because side-effects will be avoidable. Also drug dosages will be based on a person’s genetics. This will maximize the therapy’s value and decrease the likelihood of overdose. Also vaccines can be made more exactly and without risks. Pharmaceutical companies will be able to discover potential therapies more easily using genome targets. All this makes a great progress in medicine possible. But there are also several problems that have to be analyzed. In this project. The ethical, legal and social implications of pharmacogenomics have to be examined.

### *2.3.2 Working Procedure*

The project is still in the preparatory phase. The first meeting with the experts, research scientists from the Max-Delbrück-Centrum für Molekulare Medizin, Berlin-Buch, and the Europäische Akademie, will be taking place in Berlin from 20<sup>th</sup>–21<sup>th</sup> March 2003. In this workshop experts from pharmacology, genetics, medicine and philosophy will come together.

The goal of this event is to present the current status of research in the area of pharmacogenomics and related issues in the selected disciplines. This meeting should provide a framework for in-depth discussion of this important topic through small working groups comprised of high-ranking experts and other invited participants.

The workshop will be divided into three sections:

*Pharmacology/Genetics*

The core issues will be:

- the impact of genetic polymorphism on key concepts in pharmacology,
- genotyping populations and individuals: epidemiological and biostatistical aspects,
- outlook: short and mid-term perspectives,
- enhancement of effectivity of cytostatical therapy,
- pharmacogenomics and psychiatry.

*Ethical Aspects*

- new ethical aspect in pharmacogenomics,
- is a new concept of disease necessary?

*Further Aspects*

- regulatory and policy issues: the EMEA's point of view,
- the patient's situation with reference to pharmacogenomics (for example: informed consent).

2.3.3 *Participants*

*Professor Dr. C. F. Gethmann*

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*Professor Dr. D. Ganten*

Max-Delbrück-Centrum für Molekulare Medizin, Berlin

*Professsor Dr. M. Eichelbaum*

Dr. Margarete Fischer-Bosch-Institut für Klinische Pharmakologie,  
Stuttgart

*Dr. I. Härtl*

Bundesministerium für Gesundheit, Bonn

*Professor Dr. Dr. F. Holsboer*

Max-Planck-Institut für Psychiatrie, München

*Dr. D. Lanzerath*

Deutsches Referenzzentrum für Ethik in den Biowissenschaften, Bonn

*Professor Dr. I. Roots*

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*Dr. St. Stürzebecher*

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*Professor Dr. M. Sutrop*

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## **2.4 Environmental Noise: Main focus: Aircraft Noise**

### *2.4.1 Background*

If noise may be defined as unwanted and/or harmful sound, we may understand from the EU directive 2002/49/EC that environmental noise is that unwanted or harmful outdoor sound created by human activities, including noise emitted by transport, road traffic, rail traffic, air traffic and from sites of industrial activity.

Noise is potentially dangerous to human beings, for besides its *subjective* valuation, it *objectively* affects the physical and psychical human health: sleep disturbances, cardiovascular problems or hearing loss are some of

the adverse effects brought into connection with noise. Furthermore, it constitutes an obstacle to social life, e.g. obstructing communication.

These facts have raised public awareness and as a consequence thereof, national and international politics have changed and a considerable number of legal instruments has been enacted in order to reduce noise emissions and to prevent exposure to it for the purpose of health protection. In spite of these measures, the public unease concerning noise has not decreased. The Europäische Akademie is aware of the relevance of this issue and, therefore, is willing to contribute to its comprehension and solution. Following the recent general EU-directive on Assessment and Management of Environmental Noise named above, and thus focusing on noise produced by human activity, the Akademie is planning this international and interdisciplinary research project. Special attention will be paid to aircraft noise, since it may work as a paradigm and paradoxical case: air-travel is a growing noise source and people are increasingly intolerant to noise; simultaneously air-travel is to be seen as a core element of the increasingly accepted modern mobility, thus endowed with a high economic potential.

#### 2.4.2 Task

As a result of at an expert meeting on this subject organised by the Akademie on the 12<sup>th</sup> and 13<sup>th</sup> December 2002, the project will deal with the different aspects of noise and offer a multidisciplinary answer to several questions that are still open and consequently requiring research in domains such as:

##### a) Medicine

- Determination of sound thresholds referring to subjective and/or objective health disturbance (since they are the basis of any measures to be taken e.g. legal, economic, technological, etc.).
- More accurate knowledge on dose-effect ratio.

b) Technology

- Visions aiming at noise reduction and elimination, both concerning its source and consequences.
- Revision of DbA as unit of noise measurement.

c) Economy

- Analysis of the costs of noise and of noise disturbance (health, change of house and rent prices, etc.) and of the degree of willingness to pay for its avoidance.
- Costs of noise reduction and elimination.

d) Sociology/Psychology

- Different local, regional and international subjective acceptance of noise.
- Magnet-repellent-function of noise sources (e.g. airports, railway stations, etc.).

e) Philosophy

- Normative problem of the conflict between growing need for mobility and progressive noise intolerance.
- Subjective and objective reasonableness of noise burden and pollution.

f) Law

- Consideration and attention to the different sensitivities and effects on health of noise on the population when establishing norms (e.g. protection of the different population groups, more accurate determination of protection zones and measures, etc.).
- International norm conformation and adjustment.

g) Politics

- Conflict between individual and public interest.
- Cost-benefit analysis of noise.
- Assignment of uniform values and methods aiming at international data comparability.

The main goal is to focus on the noise question from those relevant points of view and elaborate a common set of recommendations at European level for the political decision-makers.

#### 2.4.3 *Method and working procedure*

This project will start in the second half of 2003, meaning that the list of expert members will be closed after the first half of 2003. The working programme was established at the aforementioned expert meeting in December 2002.

By means of workshops and regular meetings held by the project group, the aim is to reach a common position that will facilitate the achievement of the main goal.

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## IV. Scientific Communication and Cooperation

### 1. Academy Conferences

#### 1.1 Spring Conference 2001

*“The Uniqueness of Humankind” –*

*“Über die Sonderstellung des Menschen” 28<sup>th</sup>–30<sup>th</sup> March 2001*

At present, those biological disciplines, whose objects of research include human beings, underline the extensive similarities and common characteristics between humans and other species. Apparently, these biological findings concur with the criticism of anthropocentrism, which is expressed in Western philosophy of nature and by ethicists.

In contrast to this, biological and philosophical anthropologies of the 20th century keep emphasising the *Sonderstellung* of humans among the realm of living beings. However, it is not clear yet how this particular role should be characterised, how it should be reconciled with biological findings, and which theoretical and practical conclusions should be drawn from it.

The spring symposium took place in Bad Neuenahr-Ahrweiler from 28<sup>th</sup>–30<sup>th</sup> March 2001. The conference, which was organised jointly by the Europäische Akademie and the Medical Society Gießen, explored the question of the unique position of the human being. It approached the theoretical and practical concept of the *Sonderstellung* against the background of present day knowledge in biosciences. Furthermore, by interdisciplinary efforts, an attempt was made to clarify those conceptual problems that arise with the idea of the uniqueness of humankind.

Three sections were established:

1. Anthropology from the philosophical and biological point of view

2. The particular role of the human being against the background of recent biological research
3. Ethical and legal reflection on the particular position of the human being

Participants came from Austria, Great Britain, The Netherlands, Latvia, Poland, Russia, Switzerland, USA and Germany. After a keynote address by H.-R. Duncker "*Man as a biological and cultural being*" the theoretical and practical concept of the *Sonderstellung* of the human being was examined in three thematic sections against the background of present day knowledge in biosciences, philosophy, sociology and jurisprudence. The sections were chaired by G. Vowinkel, F. Thiele and M. Gutmann. Contributions: "*The human: between having a world and being a self*", O. Schwemmer, K.-P. Valerius; "*Genes, instinct and identity*" P. Bateson; "*Social existence of man*" K. O. Hondrich; "*Die praktische Sonderstellung des Menschen*" C. F. Gethmann; "*Die Sonderstellung des Menschen im Verfassungsrecht*" R. Müller-Terpitz. Contributions will be published in the academy's book series.

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## **1.2 Autumn Conference 2001**

***"Information Security - Electronic Signatures – Data protection",  
21<sup>st</sup>–23<sup>rd</sup> November 2001***

The Annual Autumn Conference was held at the SETA Hotel in Bad Neuenahr-Ahrweiler from 21<sup>st</sup>–23<sup>rd</sup> November 2001. The symposium was organised by the Europäische Akademie and supported by the msc Multimedia Support Center GmbH.

Speakers from universities, research institutions and industry presented high quality papers during the three days of the conference to cover quite a lot of aspects related to the information society. In particular, they con-

centrated upon the key issues of information security, electronic signatures and data protection.

#### Workshop: Electronic Signatures

The Europäische Akademie offered a one-day workshop on electronic signatures this included principle elements, concepts and applications. For many organisations and companies the completion of an internet presentation project is only the first step towards a successful e-commerce platform. But the step from a pure web-presentation to the full commercial potential of an electronic market place with virtual payment is a big one, often requiring additional investment and expertise. Therefore, a meaningful electronic signature can boost this business, because the electronic signature allows people to electronically sign any electronic document in a legally-valid and enforceable manner.

The workshop was directed at the following groups of person:

- companies which plan to adopt electronic signatures at present or in the future,
- the representatives of administrative bodies and units which want to realise services for the citizen,
- management consultants involved in shaping the developments on electronic signatures.

#### Congress: Security and Autonomy in the Information Society

Speech is the most natural means of communication between people. As a leading European technology assessment institution, the Europäische Akademie brought together key speakers and experts from science and industry to discuss the core issues and solutions that are making a huge impact on security and autonomy in the information society. In particular, the congress covered the important topics of information security and data protection. A successful congress includes more than a strong programme, therefore the unique session “Zwiegespräch”, offering the opportunity to ask questions and talk quite at ease about the main issues in the field of information society set the scene for the hospitality evening.

The congress was designed for:

- the community from universities, research institutions and industry concerned with IT,
- companies involved in developing and processing of IT-equipment (soft- and hardware manufacturers, service providers),
- scientists with a relationship to IT issues from various disciplines involved (legal science, economics, the political and social sciences, and technology),
- management consultants in the field of e-business,
- the representatives of administrative bodies and units regulating or supporting IT-technology and decision makers from politics (executive, legislative),
- representatives of the general public (NGOs),
- journalists involved in IT-subject matter.

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### **1.3 Spring Conference 2002**

***“Nachhaltige Entwicklung und Innovation. Globale Perspektiven wirtschaftlichen Handelns” – “Sustainable Development and Innovation. Perspectives for Global Economic Activities”, 13<sup>th</sup>–15<sup>th</sup> March 2002***

The catchwords ‚sustainable development‘ and ‚innovation‘ as main concepts of modern environmental and economic policies appear to be excluding each other at first sight. The demand for a sustainable development prevents innovations; innovations – driving economic development – jeopardize a sustainable development.

A closer look makes us discover that the concepts should better be understood as complements to each other: Without innovations a sustainable

development is not reachable; the value added of innovations is enhanced by an alignment in terms of a sustainable development. This complementary view is widely accepted today. Nevertheless, it is far from clear how innovations and sustainable development interact in specific contexts.

The spring symposium 2002 integrated the views of the sciences as well as of companies towards this specification. A dialogue was enabled that demonstrated the potentials of innovations for a sustainable development as well as the advantages of the concept of a sustainable development for innovations.

Invited speakers have been:

Professor Dr. Ulrich Steger, Lausanne: *Nachhaltige Entwicklung und Innovation in einer globalisierten Wirtschaft*

Professor Dr. Kornelis Blok, Utrecht: *Energiesysteme und Entwicklungsszenarien*

Professor Dr. Dieter Imboden, Zürich: *Die Beurteilung von Energiesystemen*

Dr. Dieter Jahn, BASF AG: *Beiträge von Forschung und Entwicklung zur nachhaltigen Entwicklung am Beispiel der BASF-Gruppe*

Dr. Christian Schneller, E.ON Energie AG: *Nachhaltigkeit, Innovation und Wettbewerb – Aus dem Geschäft eines Energieversorgers*

Heinz-Jörg Brecker, Vaillant GmbH: *Nachhaltige Entwicklung – geplante Innovationen. Prozessorientierte Produktentwicklung bei Vaillant*

Professor Dr. Hans G. Nutzinger, Kassel, and Professor Dr. Rudi Kurz, Pforzheim: *Nachhaltige Innovationen. Eine Restriktion als Chance für wirtschaftliche Entwicklung*

Professor Dr. Walter Frenz, Aachen: *Das Recht nachhaltiger Innovationen*

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## **1.4 Autumn Conference 2002**

### *“Nanotechnology Assessment”, 13<sup>th</sup>–14<sup>th</sup> September 2002*

“Nanotechnology Assessment” was the title of the annual Autumn Conference of the Europäische Akademie. It took place in Bonn from 13<sup>th</sup> to 14<sup>th</sup> September 2002. The scientific symposium focussed on Nanoelectronics and in this field especially on Nanocomputing. Three high-ranking American scientists, among them the Feynman-Prize for Nanotechnology winners Jim Heath and Stan Williams, reported on the state of the art.

Professor Jim Heath from the University of California, Los Angeles, reported on the use of supra-molecular compounds, such as Nano-switches in memory chips. Heath’s group was able to demonstrate electronically configurable molecular based logic circuitry which is a great stride for molecular electronics towards concrete application. Dr. Stan Williams from HP Laboratories, Palo Alto, focussed on concepts to integrate molecular electronics in computer systems. One main topic is the ability of these computer systems to identify and bypass defective switch elements. Generally it became obvious that the future potential of molecular electronics is not only due to a higher density of integration but also to substantially lower production costs.

In her presentation “Proteins as mechano-chemical nanoswitches”, Professor Viola Vogel (University of Washington, Seattle), raised the question as to which lessons we can learn from the study of biological systems. In a few examples, she illustrated how mechanical stretching of adhesion proteins can switch function. Moreover, Professor Vogel presented motor proteins as nature’s “crown jewels”, as they convert chemical energy into mechanical force under load. She showed how to use biological motors in man-made materials, for example to engineer a monorail at the nanoscale and if incorporated into first motor-driven devices.

Dr. Gerd Bachmann (VDI-TZ Düsseldorf) mentioned economic aspects of nanotechnology. It became obvious that the quantification of the added value of Nanotechnology dramatically depends on the question as to what

is or should be taken as nanotechnology? Finally, Professor Alfred Nordmann (University of South Carolina and TU Darmstadt) emphasised the need to clarify the epistemological status of nanotechnology and nano science in an attempt to provide a nanotechnology assessment.

The presentations were complemented by comments given by Dr. Marcel Mayor (Research Centre Karlsruhe), Professor Dr. Ulrich Simon (RWTH Aachen) and Dr. Gerd Hanekamp (Europäische Akademie, Bad Neuenahr-Ahrweiler). The results of the conference will be included in a future project of the Europäische Akademie on nanotechnology.

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## **2. Expert Meetings**

### **2.1 31<sup>st</sup> May–1<sup>st</sup> June 2001: “Rationierung in der Medizin” (Rationing in Medicine)**

*Invited speakers:* Susanne Hahn (Duisburg), Professor Dr. Weyma Lübbe (Leipzig), Dr. Tibor Horvath (Balingen), Professor Dr. Jochen Taupitz (Mannheim), Professor Dr. Dieter Birnbacher (Göttingen)

The expert-meeting on rationing in medicine was jointly organized by the FernUniversität Hagen (Fachbereich Erziehungs-, Sozial- und Geisteswissenschaften, Institut für Philosophie, Fern-Universität Hagen, A. Gethmann-Siefert) and the Europäische Akademie. Lectures were held on “Hypothetische Rechtfertigung am Beispiel der Allokation von Gesundheitsleistungen” (Susanne Hahn), “Rationierung – grundlegende philosophische Prinzipien und Praxis” (Weyma Lübbe), “Mikroallokation in der Regelversorgung” (Tibor Horvath), “Allokation und Rationierung im Gesundheitswesen – rechtliche Perspektiven” (Jochen Taupitz) and “Allokation und Rationierung im Gesundheitswesen – Eine ethische Perspektive” (Dieter Birnbacher). The proceedings of this workshop will be

used for teaching in the medical ethics courses of the FernUniversität Hagen.

**2.2 10<sup>th</sup>–12<sup>th</sup> January 2002: Euthanasia/Physician Assisted Suicide – Juridical, Philosophical and Practical Aspects (Sterbehilfe. Rechtswissenschaftliche, philosophische und Praxis-Aspekte)**

*Invited speakers:* Drs (NL) Jeantine Lunshof (Bad Neuenahr-Ahrweiler), Professor Dr. Hans-Ludwig Schreiber (Göttingen), Klaus Kutzer (Karlsbad-Spielberg), Professor Dr. Reinhard Merkel (Hamburg), Professor Dr. Dietrich Kettler (Göttingen), Professor Dr. Dieter Birnbacher (Düsseldorf)

From 10<sup>th</sup> to 12<sup>th</sup> 2002, the Europäische Akademie in cooperation with the FernUniversität, Hagen conducted an expert meeting with the title *Sterbehilfe. Rechtswissenschaftliche, philosophische und Praxis-Aspekte* (Euthanasia/Physician Assisted Suicide – Juridical, Philosophical and Practical Aspects). Modern medico-technical developments are bringing dying and death increasingly into the sphere of human intervention. In cases where prolonging the life of a person concerned is perceived merely as the prolongation of suffering without any hope of recovery, the demand is made to pay more respect to the right of self-determination of the patient with regard to the time point of death.

Controversies flare up for one thing when the question is posed whether assisted suicide should ever be permitted at all. This question is frequently seen in connection with the possibilities of palliative pain treatment. Furthermore, fears exist with regard to the possible difficulties involved in containing the consequences of the practical implementation of regulations concerning assisted suicide. Finally, the question arises as to whether there should be a differentiation, from the moral and (juridical) practical point of view, between active and passive euthanasia. This question is of particular relevance in regard to the role of the physician.

The aim of the expert discussion was to make a contribution to the rational assessment of active and passive suicide assistance and its possible

practical implementation. The organisation was undertaken by Professor Annemarie Gethmann-Siefert, Dr. Felix Thiele, Minou Bernadette Friele, M.A. and Dipl.-Päd. Ulrike Henckel. A publication of the results of the expert discussion currently prepared.

### **2.3 9<sup>th</sup>–10<sup>th</sup> September 2002: “Symposium Biodiversity – (Scientific Basis and Social Relevance)”**

*Invited speakers:* Professor Dr. Rudolf Amann (Bremen), Professor Dr. Jürgen Bereiter-Hahn (Frankfurt/M.), Professor Dr. Michael Bölker (Marburg), Priv.-Doz. Dr. Broder Breckling (Bremen), Dr. Michael Gudo (Frankfurt/M.), Dr. Dr. Mathias Gutmann (Marburg), Professor Dr. Peter Janich (Marburg), Professor Dr. Dr. Peter Kämpfer (Giessen) and Professor Dr. Ramón Rosselló-Mora (Mallorca), Professor Dr. Rainer Marggraf (Göttingen), Professor Dr. Heinz Saedler (Köln), Dr. Michael Weingarten (Jena)

From 9<sup>th</sup> to 10<sup>th</sup> September 2002 the Philosophical Institute Marburg and the Europäische Akademie organised a Symposium on biodiversity with the aim to present some results of the Academy’s former project group “Biodiversity – Scientific basis and social relevance” and to discuss them in a circle of interested scientist from science and humanities. The symposium focused on two main aspects presented, the signification of modern molecular biology for biodiversity research and its relationship to other more “classical” relevant sciences as well as on the differences between species concepts used in different scientific fields and their dependence on special contexts and purposes. It became clear that molecular biology can support biodiversity research in an important way also in fields where the species concept is very limited (i.e. microbiology). Even if reductionistic approaches became evident in a more or less explicit way, they could be nevertheless well be critically discussed in the interdisciplinary circle. Furthermore, the question on the relevance and aims of biodiversity for the society have been risen, that, according to some participants, could not be answered or satisfied by scientific disciplines but need a societal discourse.

Sections have been: I. Setting the Stage, II. Molekularbiologische Aspekte, III. Biodiversität im Diskurs.

## **2.4 12<sup>th</sup>–13<sup>th</sup> December 2002: “Environmental Noise: Aircraft Noise”**

*Invited speakers:* Professor Dr. Klaus Kornwachs (Cottbus); Professor Dr. Barbara Griefahn (Dortmund); Dr. Dietmar Wurzel DLR (Köln-Porz); Professor Dr. Rainer Friedrich (Stuttgart); Carlos San Martín AENA (Spain); Professor Helmut Strasser (Giessen)

This expert meeting was the first scientific approach of the Akademie to the noise question and it aimed at achieving an inter- and transdisciplinary perspective of environmental noise (main focus: aircraft noise), so as to present the state-of-the-art in the different fields and to point out which problems require further clarification and thus research. As the main result of the meeting should be stressed the need for better criteria on the determination of noise limits, so that subjective disturbance and health nuisance be considered at the same time in its diversity and with the broadest possible scope of application. A right noise limit definition – which should consider the different noise sources and be the consequence of a clear and unified quantification method – is essential, since it is the basis for any measure to be taken in the legal, economical and technical areas.

## **3. Publications**

### **3.1 Series “Wissenschaftsethik und Technikfolgenbeurteilung” issued by Carl Friedrich Gethmann**

Volume 10      Janich P, Gutmann M, Prieß K (eds) (2001) *Biodiversität. Wissenschaftliche Grundlagen und gesellschaftliche Relevanz*. Springer, Berlin Heidelberg New York

*Papers:*

Gutmann M, Janich P, Gudo M, Steininger F F, Türkay M, Amann R, Roselló-Mora R, Kim J T, Schöbbermeyer H, Theißen G, Saedler H, Back G, Marggraf R, Stratmann U, Wolfrum R

- Volume 11 Decker M (ed) (2001) *Interdisciplinarity in Technology Assessment. Implementation and its Chances and Limits*. Springer, Berlin Heidelberg New York

*Papers:*

Gethmann C F, Funtowicz S, Ravetz J, Carrier M, Decker M, Grunwald A, Reuzel R P B, Cope D, Liakopoulos M, Hronszky I, Renn O, Jovell A J, Rotmans J, Kemp R, van Asselt M, van der Sluijs J, Klopogge P

- Volume 12 Langenbach C J, Ulrich O (eds) (2002) *Elektronische Signaturen. Kulturelle Rahmenbedingungen einer technischen Entwicklung*. Springer, Berlin Heidelberg New York

*Papers:*

Banse G, Bäumler H, Dumortier J, Genghini R, Kiepas A, Langenbach C J, Lutterbeck B, Machleidt P, Pfitzmann A, Rudinger G, Ulrich O, Voßbein R

- Volume 13 Breyer F, Kliemt H, Thiele F (eds) (2002) *Rationing in Medicine. Ethical, Legal and Practical Aspects*. Springer, Berlin Heidelberg New York

*Papers:*

Hahn S, Schultheiss C, Raspe H-H, Hunter D J, Schöne-Seifert B, Imhoff M, Krämer W, Zweifel P, Szymkowiak C, Taupitz J, Baumann M, Lübke W, Fritze J, Wambach A, Kliemt A

- Volume 14 Christaller T, Decker M, Gilsbach J-M, Hirzinger G, Lauterbach K, Schweighofer E, Schweitzer G, Sturma D (2001) *Robotik. Perspektiven für menschliches Handeln in der zukünftigen Gesellschaft*. Springer, Berlin Heidelberg New York
- Volume 15 Grunwald A, Gutmann M, Neumann-Held E (eds) (2002) *On Human Nature. Anthropological, Biological, and Philosophical Foundations*. Springer, Berlin Heidelberg New York
- Papers:*
- Böhme G, Ferré F, Rehmann-Sutter C, Duncker H-D, Pöppel E, Breidbach O, Janich P, Wolf U, Gilbert S, Neumann-Held E, Oyama S, Drieschner M, Grunwald A, Gutmann M
- Volume 16 Schröder M, Claussen M, Grunwald A, Hense A, Klepper G, Lingner S, Ott K, Schmitt D, Sprinz D (2002) *Klimavorhersage und Klimavorsorge*. Springer, Berlin Heidelberg New York
- Volume 17 Gethmann C F, Lingner S (eds) (2002) *Integrative Modellierung zum Globalen Wandel*. Springer, Berlin Heidelberg New York
- Papers:*
- Alcamo J, Janich P, Klepper G, Renn O, Grunwald A, Lingner S, Simonis U
- Volume 18 Steger U, Achterberg W, Blok K, Bode H, Frenz W, Gather C, Hanekamp G, Imboden D, Jahnke M, Kost M, Kurz R, Nutzinger G H, Ziesemer Th (2002) *Nachhaltige Entwicklung und Innovation im Energiebereich*. Springer, Berlin Heidelberg New York

### 3.2 “Graue Reihe”

- No. 24 Minou Bernadette Friele (ed), *Embryo Experimentation in Europe*, 2/01
- No. 25 Felix Thiele (ed), *Tierschutz als Staatsziel? Naturwissenschaftliche, rechtliche und ethische Aspekte*, 2/01
- No. 26 Vitaly G. Gorokhov, *Technikphilosophie und Technikfolgenforschung in Russland*, 2/01
- No. 27 Chris W. Backes, *Klimaschutz in den Niederlanden*, 3/01
- No. 28 Gerd Hanekamp, Ulrich Steger (eds) *Nachhaltige Entwicklung und Innovation im Energiebereich*, 7/01
- No. 29 Thomas Christaller, Michael Decker (eds) *Robotik. Perspektiven für menschliches Handeln in der zukünftigen Gesellschaft. Materialienband*, 11/01
- No. 30 Michael Selgelid, *Societal Decision Making and the New Eugenics*, 4/02
- No. 31 Bernhard Irrgang, *Humangenetik auf dem Weg in eine neue Eugenik von unten?*, 2/02
- No. 32 Meinhard Schröder et al., *Climate Prediction and Climate Precautions. Executive Summary*, 06/02

### 3.3 Topics of the Newsletters

- No. 24 Scientific Policy Consulting and Participation, *Gerd Hanekamp*
- No. 25 Stem Cell Therapy. The Potential Importance of Research into “Therapeutic Cloning”, Embryonic Stem Cells and Adult Stem Cells, *Robin Lovell-Badge*

- No. 26            Rechtliche Aspekte der Behandlung Schwerstkranker bei irreversiblen Schädigungen, *Klaus Kutzer*
- No. 27            Bio-Policy and the Place of Institutionalized Ethics in Political Decision Making, *Felix Thiele*
- No. 28            Integrated Models in the Field of Climate Research Coupling of Natural and Social Sciences, *Gernot Klepper*
- No. 29            Ethical Aspects of Technical Safety, *Carl Friedrich Gethmann*
- No. 30            Interaction between Robots and Humans, *Michael Decker*
- No. 31            Slippery Slope Arguments in Bioethical Debates, *Georg Kamp*
- No. 32            Protection of the Environment from Ionising Radiation. A New Challenge in Risk Management, *Deborah Oughton*
- No. 33            Climate Change. Reasonable acting towards an uncertain future?, *Stephan Lingner*
- No. 34            The Moral Status of the Embryo and the Protection of its Life, *Carl Friedrich Gethmann*
- No. 35            The (hidden) Scope of Science and Technology Assessment, *Gerd Hanekamp*

### **3.4 Journal “Poesis & Praxis”**

The Europäische Akademie Bad Neuenahr-Ahrweiler GmbH, in conjunction with the Springer Verlag Berlin Heidelberg, publishes an international and transdisciplinary journal of technology assessment and ethics of science. The Director of the Europäische Akademie is responsible as editor in chief supported by a scientific editorial board.

In the last few decades, awareness of the ambivalence of scientific-technical developments has grown. This is due to the increasing speed of tech-

nicalisation and the complexity of technology, advances in the bio-medical field and new options for action, which have arisen as a result, as well as to our becoming conscious of the limits of growth and discovering long-term global risks induced by technicalisation. Problems with regard to scientific-technical advance and the consequences thereof are accordingly – and to an increasing extent – the subject of political and public debate. Hence a requirement has come about for professional and institutionalised scientific consultation in both political and social areas on how to deal with the consequences of scientific-technical developments, for example in the form of technology assessment and ethics of science.

Whilst institutionalised science (at any rate in Germany) initially functioned in a more passive sense as the contractor of political decision-making bodies, it has now – even though with delay – discovered the problem of consequences of science and technology as a new and genuine field of scientific activity. Above all, philosophy and jurisprudence, as well as social sciences have recognised the need for reflection and have reacted with their own offers of advisory services.

Within the organs of publication of these different disciplines, the discussions dedicated to this need for reflection have only managed to establish a marginal existence. Though there are some specialist journals particularly dedicated to specific consequences of scientific-technological and/or bio-medical developments (for example the journals *Science and Engineering Ethics*, *Ethik in der Medizin* or the *Journal of Applied Ethics*), these journals are all firmly anchored in their own disciplines (Philosophy, Social Sciences etc.). Therefore they are limited to the specifics of presenting the respective subjects and addressed to a specific readership. On the other hand, various organs of publication from within the field of technology assessment, which are not bound to individual disciplines (*TA-Datenbank Nachrichten*, *Information zur TA* or *IPTS Report*), are not conceived as specialist journals but serve to provide communication within TA networks and present activities in the field of institutions involved.

There is a need for an organ with the intellectual standards of a scientific journal dedicated – without respect for disciplinary boundaries – to the

discussions and reflections with regard to dealing with the consequences of scientific-technological developments. In addition there is a need for an organ which enables argumentation with regard to the ideas, methods and processes of technology assessment and ethics of science beyond the boundaries of the disciplines involved. Such an organ would provide a forum for reflection on questions with regard to the future of scientific-technical civilisation. This Forum is to be the journal *Poiesis & Praxis*.

The journal *Poiesis & Praxis* is conceived as an inter-disciplinary forum for reflection on questions with regard to the future of scientific-technological civilisation. In detail, the contributions collected within the journal will be devoted to:

- (1) Research into the consequences of scientific, technological and biomedical advance with regard to their relevance to society;
- (2) Reflection from the point of view of theory of science, ethics, law, as well as sociology and economics on this type of consequence research in the sense of technology assessment and ethics of science;
- (3) Reflection on the methods, ideas and processes of technology assessment and ethics of science;
- (4) The determination of the relationship between technology assessment and ethics of science on the one hand and politics and society on the other.

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### 3.5 External Publications

Decker M (with Lauterbach K, Lindlar M) (2001) Cost-Benefit-Analysis of Telemedicine. First Steps to an Interdisciplinary Technology Assessment. In: *Innovations for an e-Society. Challenges for Technology Assessment*. Congress Pre-prints. Teltow

Decker M (2002) “Robotics in Health Care. The Role of Ethics in Interdisciplinary Technology Assessment”. In: *The Challenge of Collaboration*. Proceedings of the 18<sup>th</sup> Annual Meeting of the (ISTAC) International Society of Technology Assessment in Health Care. Urban und Fischer, München, Jena, 59

Decker M (2002) “Robotik. Perspektiven für menschliches Handeln in der zukünftigen Gesellschaft”. In: *Technikfolgenabschätzung. Theorie und Praxis*. Nr. 2, 11. Jahrgang, 107–114

Decker M (with Linger S) (2003) “Normative Implikationen und intergenerationelle Lernprozesse langfristigen Umwelthandelns”. In: Gotthard Stein (Ed): *Umwelt und Technik im Gleichklang. Technikfolgenforschung und Systemanalyse in Deutschland*. Springer, Berlin Heidelberg New York

Friele M B (2001) “The extent of collective responsibility in medical science”. In: *Monash Bioethics Review*, Vol. 20, No. 3, 62–75

Friele M B (2001) “Lexikon der Bioethik – Studienausgabe mit CD-Rom”, Rezension, *Journal für Philosophie* Nr. 13 (1/01), Stuttgart

- Gethmann C F (with Kamp G) (2001) “Gradierung und Diskontierung von Verbindlichkeiten bei der Langzeitverpflichtung”. In: Birnbacher D, Brudermüller G (eds): *Zukunftsverantwortung und Generationensolidarität*, Würzburg, 137–153
- Gethmann C F (2001) “Heideggers Konzeption des Handelns in *Sein und Zeit*” (japanese translation). In: Gethmann-Siefert A, Pöggeler O, *Heidegger to Jissentetsugaku*, Tokyo, Hosei University Press, 165–213
- Gethmann C F (2001) “Die Einheit der praktischen Vernunft und die Vielheit der Kulturen”. In: Fikentscher W, Simon-Schaefer R, Gethmann C F, Walter N (eds) *Globale Gerechtigkeit*, Bamberg , 13–29
- Gethmann C F (am 25.7.2001) *Schweineorgane für den Menschen*, Interview zur Xenotransplantation, Saarländischer Rundfunk SR2
- Gethmann C F (2001) “Ethical Aspects of Technical Safety”. In: World Congress on Safety of Modern Technical Systems. Congress-Documentation, Saarbrücken, 45–55
- Gethmann C F (2001) “Ethical Aspects of Long-term Responsibilities in Research”. In: Smelser N J, Baltes P (eds) *International Encyclopedia of The Social and Behavioral Sciences*, Oxford, vol 19, 13227–13231
- Gethmann C F “Ethische Argumente gegen das Klonieren von Menschen”. In: Jakovljevic D, *Angewandte Ethik*, Podgorica 1999, 87–191
- Gethmann C F (with: Honnefelder L, Schwemmer O, Siep L) (eds) (2001), “*Die Natürlichkeit der Natur und die Zumutbarkeit von Risiken*”, Abschlussbericht (Ethik in den Biowissenschaften und Medizin, Band 1), Institut für Wissenschaft und Ethik, Bonn.
- Gethmann C F (2001) “Hermeneutische Phänomenologie und Logischer Intuitionismus”. In: Mittelstraß J, Gethmann-Siefert A (eds), *Die Philosophie und die Wissenschaften. Zum Werk Oskar Beckers*. München, 109–128

Gethmann C F (2001) “Arend Heyting und die phänomenologische Erkenntnistheorie”. In: Mittelstraß J, Gethmann-Siefert A (eds), *Die Philosophie und die Wissenschaften. Zum Werk Oskar Beckers*. München, 149–159

Gethmann C F (with Thiele F) (2002) “Ethical Arguments against the Cloning of Humans”. In: *Poiesis and Praxis* 1, 35–46

Gethmann C F (2002) “Participatory Technology Assessment. Some Critical Questions”. In: Decker M (ed), *Interdisciplinarity in Technology Assessment. Implementation and its Chances and Limits*. Berlin, 3–13

Gethmann C F (2002) “Ethische Grundfragen einiger aktueller Entwicklungen biomedizinischer Forschung und von ihnen ausgehender diagnostischer und therapeutischer Optionen. (Präimplantationsdiagnostik, Forschung an humanen embryonalen Stammzellen, therapeutisches Klonen)”. In: Der Präsident des Landtages Rheinland-Pfalz (ed), *Was kann, was darf der Mensch?* Symposium zu aktuellen Fragen der Bioethik im Landtag Rheinland-Pfalz am 16. Oktober 2001, Mainz, 107–113

Gethmann C F (2002) “Klimavorhersage und -vorsorge”, Interview mit Professor Dr. C. F. Gethmann, Bad Neuenahr-Ahrweiler, und Professor G. Klepper, Kiel. In: *Energiewirtschaftliche Tagesfragen* 52, Heft 1–2, 94 f

Gethmann C F (with Sander T) (2002) “Anti-Mentalismus”. In: Gutmann M, Hartmann D, Weingarten M, Zitterbarth W (eds), *Kultur – Handlung – Wissenschaft*. Für Peter Janich, Weilerswist, 91–108

Gethmann C F (2002) “Pragmazentrismus”. In: Eusterschulte A, Ingeniep H W (eds) *Philosophie der natürlichen Mitwelt. Grundlagen – Probleme – Perspektiven*, Würzburg, 59–66

- Gethmann C F (2002) “Phasenhaftigkeit und Identität menschlicher Existenz. Zur Kritik einiger Visionen vom Altern”. Max-Planck-Gesellschaft (ed), *Biomolecular Aspects of Aging. The Social and Ethical Implications*, München, 50–61
- Gethmann C F (with Fey G H) (2002) “Wir dürfen unsere Evolution nicht dem Zufall überlassen”. In: Nida-Rümelin J (ed) *Ethische Essays*. Frankfurt/Main, 442–448
- Gethmann C F (2002) “Ethische Anmerkungen zur Diskussion um den moralischen Status des menschlichen Embryos”. In: *Deutsche Richterzeitung* 80, 204–208
- Gethmann C F (2002) “Praktische Vernunft und technische Kultur”: Stiftung Brandenburger Tor (ed), *Technikkultur. Von der Wechselwirkung der Technik mit Wissenschaft, Wirtschaft und Politik*, Berlin, 141–161
- Gethmann C F (2002) “Participatory Technology Assessment. Some Critical Questions”. In: *Poiesis und Praxis* 1, 151–159
- Hanekamp G (2001) “Kulturalistische Unternehmensethik. Ein Programm”. In: *Zeitschrift für Wirtschafts- und Unternehmensethik*, no. 2, 48
- Hanekamp G (2001) Scientific Political Consulting and Participation. In: *Poiesis & Praxis* 1, Heft 1, 78–84
- Kamp G (2001) *Logik und Deontik. Über die sprachlichen Instrumente praktischer Vernunft*. Paderborn (Mentis-Verlag)
- Liakopoulos M (2001) The Politics of Technology Assessment. In: Deckert M (ed) *Interdisciplinarity in Technology Assessment; Implementation and its Chances and Limits*. Springer, Heidelberg

- Liakopoulos M (2002) Pandora's Box or panacea? Using Metaphors to Create the Public Representations of Biotechnology. In: *Public Understanding of Science*, Volume 11, no. 1, pp 5–32.
- Liakopoulos M (2002) Media coverage 1973–1996: Trends and Dynamics. In: Bauer M & Gaskell G (eds), *Biotechnology: The Making of a Global Controversy*. Cambridge: Cambridge University Press. (in collaboration with media experts of the Concerted Action)
- Liakopoulos M (2002) Testing Times – the reception of Roundup Ready soya. In: Bauer M. & Gaskell G (eds) *Biotechnology: The Making of a Global Controversy*. Cambridge: Cambridge University Press (in collaboration with media and policy experts of the Concerted Action)
- Liakopoulos M (2002) The Structures of Public Perceptions. In: Bauer M & Gaskell G (eds) *Biotechnology: The Making of a Global Controversy*. Cambridge: Cambridge University Press (in collaboration with public perceptions experts of the Concerted Action)
- Lingner S (2001) “Gentechnische Anpassung an globale Erwärmung?”, Letter in: *Spektrum der Wissenschaft*, 8
- Linger S (2002) “Natural attenuation. Legitimate instrument or excuse for business as usual? (Poster paper). European Conference on Natural Attenuation (DECHEMA), Heidelberg,
- Lingner S (with Decker M) (2002) “Normative Implikationen und intergenerationelle Lernprozesse langfristigen Umwelthandelns”, In: Stein G (ed): *Umwelt und Technik im Gleichklang. Technikfolgenforschung und Systemanalyse in Deutschland*. Springer, Berlin Heidelberg, 147–162
- Lunshof J (2001) “Selbstbestimmung: Ein theoretisches Konzept und seine Bedeutung in der Praxis”. In: Bund Deutscher Hebammen e.V. (ed) *Gebären zwischen Selbstbestimmung und gesellschaftlicher Kontrolle*, Kongressband 9. Hebammenkongress, Karlsruhe

- Lunshof J (2001) “Bleibt die Menschenwürde auf der Strecke?”, statement in: *“Ware Mensch? – Der menschliche Embryo als Objekt der Begierde”*, Institut für Kirche und Gesellschaft, Iserlohn, 111–112
- Lunshof J (2002) “Terminale Sedierung – Kommentar aus ethischer Sicht”. In: *Zeitschrift für Palliativmedizin*, 3. Jahrgang, S1, 529
- Lunshof J Interview by Max Lorenzen on the practice and regulation of euthanasia in the Netherlands. For the complete interview please see: <http://www.philosophia-online.de/mafo/heft2002-03/Lunshof.htm>
- Rehberg U (2001) “Integrativer Naturschutz als Beitrag zu einer nachhaltigen Landschaftsnutzung in Verdichtungsräumen”, in: Bundesamt für Naturschutz (ed), Korn H, Feit U (Bearb.): *Treffpunkt Biologische Vielfalt. Interdisziplinärer Forschungsaustausch im Rahmen des Übereinkommens über die biologische Vielfalt*, Bonn
- Selgelid M J (April 2001) “Eugenic Abortion, Moral Uncertainty and Social Consequences”. In: *Monash Bioethics Review*, Vol. 20, No. 2, 26–42
- Thiele F (1/2001) *Humangenetische Diagnostik. Wissenschaftliche Grundlagen und gesellschaftliche Konsequenzen*. (Thiele F, Bartram CR) Management & Krankenhaus, 26
- Thiele F (2002) *Bio-Policy and the Place of Institutionalised Ethics in Political Decision Making*. Newsletter no. 27 (July), Europäische Akademie GmbH, pp 1–3. Reprinted in: *Human Reproduction and Genetic Ethics. An International Journal*, Vol.8, No. 2, 29–31
- Thiele F “Moral Arguments against the Cloning of Humans”. (Gethmann C F, Thiele F) In: *Poiesis and Praxis*. Springer, Heidelberg, 1: 35–46
- Thiele F “Moralische Probleme der Grünen Gentechnik”. In: Braun G et al. (eds) *Gemachte Natur. Orientierungen zur grünen Gentechnik*. Karlsruhe, pp 104–116

Thiele F “Bioethics Examples from the Life Sciences”. In: Smelser N J, Baltes P B (eds) *International Encyclopedia of the Social and Behavioral Sciences*. Elsevier, Oxford, Band 2, pp 1190–1195

Thiele F “Research Conduct: Ethical codes”. In: Smelser N J, Baltes P B (eds) *International Encyclopedia of the Social and Behavioral Sciences*. Elsevier, Oxford, Band 19, pp 13224–13227

Thiele F “Who should be the principal agent in microallocation? – Ethical comment on Horvath”. In: Dietrich F, Kliemt H, Imhoff M (eds) *Micro-Allocation of Medical Resources. Economics and Ethics*. Accedo Verlagsgesellschaft, München, pp 44–47

Thiele F “A moral argument against human germline therapy?” In: *Poiesis and Praxis*. Springer, Heidelberg, 1:160–164

## 4. Lectures

### *Michael Decker*

15.3.01 “Der interdisziplinäre Experten-Diskurs. Ein Selbstläufer?”, Workshop “Diskursiv vernetzte Technikfolgenabschätzung – Ihre Formen, Funktionen und Probleme”, Kulturwissenschaftliches Institut Essen

11.6.01 “Werden Roboter den Menschen ersetzen? Eine rationale Technikfolgenbeurteilung”, 1. Kölner Wissenschaftstag an der Fachhochschule Köln

18.6.01 “Interdisciplinary Technology Foresight. A Quality Controlled Procedure”, The 21<sup>st</sup> International Symposium on Forecasting, June 17–20, Pine Mountain, Georgia, USA

- 12.9.01 “Autonome Roboter. Wird der Mensch bald ersetzt?“, Heinz Nixdorf MuseumsForum, Paderborn
- 26.9.01 “Robotik. Optionen der Ersetzbarkeit des Menschen“, Tagung “Informatik 2001“, Wien
- 18.10.01 (with K. Lauterbach and M. Lindlar) “Cost-Benefit-Analysis of Telemedicine. First Steps to an Interdisciplinary Technology Assessment”, Innovations for an e-Society, Challenges for technology Assessment, Berlin
- 7.11.01 “Robotik. Perspektiven menschlichen Handelns in der zukünftigen Gesellschaft“, Workshop “Ethik und Forschung“, Vertretung Rheinland-Pfalz, Brüssel
- 9.11.01 “Roboter. Wird der Mensch bald ersetzt? Eine rationale Technikfolgenbeurteilung“, Tourbot-Projekt, Deutsches Museum Bonn
- 30.1.02 “Robotik. Perspektiven für menschliches Handeln in der zukünftigen Gesellschaft – Eine Technikfolgenbeurteilung“, Forum Philosophicum der Fernuniversität Hagen
- 5.2.02 “Technikfolgenbeurteilung der Robotik. Eine interdisziplinäre Unternehmung“, VDMA, Fachabteilung Robotik, Frankfurt
- 8.3.02 “Qualitätssicherung in der interdisziplinären Forschung“, ITA-Gesprächskreis des BMBF, Bad Neuenahr-Ahrweiler
- 15.4.02 “Moderne Roboter. Eine Technikfolgenbeurteilung“. Kolloquium des Instituts für Technikfolgenabschätzung und Systemanalyse (ITAS), Karlsruhe
- 7.5.02 “Einführung in die Diskussion: Auswirkungen der Nanotechnologie auf die Gesellschaft“, Kongress NanoDE. Innovationen durch Nanotechnologie, Bundeshaus Bonn

- 12.6.02 “Robotics in Health Care. The Role of Ethics in Interdisciplinary Technology Assessment”. Workshop “Integrating Ethical Enquiry and HTA” at the 18th annual meeting of ISTAHC, Berlin
- 1.11.02 “Die Europäische Akademie GmbH und eines ihrer Projekte: Robotik. Optionen der Ersetzbarkeit des Menschen”. Öffentlicher Vortrag bei der Ahrtalschau, Bad Neuenahr-Ahrweiler
- 19.11.02 “Werden moderne Roboter den Menschen ersetzen?” Studienkreis Schule und Wirtschaft, FH Remagen
- 22.11.02 “Roboter-Gehilfen oder Ersatz für den Menschen?”, Podiumsdiskussion bei der Präsentation der Technologieregion Karlsruhe, Berlin

***Minou Bernadette Friele***

- 9.7.01 “Die Bioethik-Konvention des Europarates. Probleme und Perspektiven”, Graduiertenkolleg Essen
- 26.10.01 Lernwerkstatt Bioethik: “Experten lernen von Laien”, Bildungszentrum des deutschen Beamtenbundes, Königswinter
- 9.7.02 Impulsreferat: “Zur demokratischen Legitimität von Ethikkomitees” Workshop “Welche Autorität haben nationale Ethik-Komitees?” Kulturwissenschaftliches Institut Essen

***Carl Friedrich Gethmann***

- 10.1.01 “Ort des Erkennens. Unzeitgemäße Betrachtungen zur deutschen Universität”: Institut für Philosophie der Universität Greifswald

- 5.2.01 “Ethische Probleme einer rationalen Risikobeurteilung”: Philosophisches Seminar und Forum Philosophie & Wissenschaft der Universität Mainz
- 30.3.01 “Die praktische Sonderstellung des ‚Menschen‘”, International Conference on the Uniqueness of Humankind – Über die Sonderstellung des Menschen, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler
- 4.4.01 “Ethische Probleme der nuklearen Endlagerung”, Tagung “Ethische Aspekte der Endlagerung”, Gesellschaft für Anlagen- und Reaktorsicherheit, Köln
- 19.4.01 “Praktische Vernunft und technische Kultur”, Workshop “Bildung, Sicherheit, Orientierung” der Stiftung Brandenburger Tor, Max Liebermann Haus, Berlin
- 14.5.01 “Partizipation und Langzeitverantwortung”, Forschungszentrum Karlsruhe, Institut für Technikfolgenabschätzung und Systemanalyse
- 21.6.01 “Information und Kommunikation”, forum philosophicum, FernUniversität Hagen
- 7.9.01 “Der Ort des Erkennens. Zur Philosophie der Universität”, Kolloquium “Die Idee der Universität”, FernUniversität Hagen
- 12.9.01 “Ethical Aspects of Technical Safety”, World Congress “Safety of Modern Technical Systems, Saarbrücken 12.–14.9.01
- 24.9.01 “Ethische Probleme der Forschung an embryonalen Stammzellen”, BioEthik Kommission des Landes Rheinland-Pfalz, Mainz

- 16.10.01 “Ethische und gesellschaftliche Aspekte aktueller Fragen der Bioethik”, Symposium des Landtages des Landes Rheinland-Pfalz, Mainz
- 25.10.01 “Professionelle Ethik und Bürgermoral. Zur gegenwärtigen Debatte um die BioPolitik”, Schloss Waldthausen, Sparkassen- und Giroverband Rheinland-Pfalz
- 7.11.01 “Ethik und Forschung am Beispiel der Forschung an embryonalen Stammzellen”, Diskussion in der Vertretung des Landes Rheinland-Pfalz, Brüssel
- 22.11.01 “Ethische Aspekte technischer Sicherheit”, Herbsttagung der Europäischen Akademie GmbH “Sicherheit und Autonomie in der Informationsgesellschaft”, Bad Neuenahr
- 29.11.01 “Ethische Probleme der Gentechnik”, Arbeitsgruppe Gentechnologiebericht der Berlin-Brandenburgischen Akademie der Wissenschaften
- 13.12.01 “Die Aufgabe der professionellen Ethik in der Diskussion um die Biopolitik”, Studium Generale an der Universität Kaiserslautern
- 28.2.02 “Ethische Probleme des reproduktiven Klonens”, Disputation mit Ludger Honnefelder, Berlin-Brandenburgische Akademie der Wissenschaften
- 7.3.02 “Der Alltag der Interdisziplinarität. Skizze eines Praxisberichts”, Gesprächskreis Innovative Technikfolgenabschätzung des BMBF, Bad Neuenahr-Ahrweiler
- 24.4.02 “Ethische Anmerkungen zur Diskussion um den moralischen Status des menschlichen Embryo”, Essener Mittwochsgesellschaft – Public Lecture “Gentechnologie. Fakten, Ethik, Rechtliche und Soziale Probleme”

- 25.4.02 “Professionelle Ethik und Bürgermoral”, Nationaler Ethikrat, Berlin
- 27.4.02 “Ethische Anmerkungen zur Diskussion um den moralischen Status des menschlichen Embryo”, The Hebrew University of Jerusalem, European Conference 2002, Berlin
- 27.4.02 “Ethische Gesellschaftsberatung”, The Hebrew University of Jerusalem, European Conference 2002, Berlin
- 03.6.02 “Zum moralischen Status des Embryo”: Ringvorlesung “Naturverständnis, Technik und humane Lebenswelt” an der Universität zu Köln
- 6.6.02 “Praktische Vernunft und technische Kultur – mit einem Blick auf die Energietechnik”: Informationskreis Kernenergie, Bonn
- 8.7.02 “Mensch-Sein, Personstatus und Lebensschutz des Embryo”: Fortbildungstagung “Mensch, Menschenwürde und Person in den bioethischen Kontroversen”, Waldhof bei Freiburg im Breisgau
- 11.7.02 “Heidegger und die Wende zur Sprache”: Kolloquium “Phänomenologie und Sprachanalyse” an der Humboldt-Universität zu Berlin
- 9.9.02 “Wer ist der Adressat der Langzeitverpflichtung?": Ladenburger Diskurs, Gottfried Daimler- und Karl Benz-Stiftung, Ladenburg
- 16.9.02 “Pragmatische Semantik”: Kolloquium “Der Neopragmatismus und das Wissenschaftsverständnis in den Kultur-, Sozial-, Medien- und Kommunikationswissenschaften”, Bad Neuenahr-Ahrweiler

- 22.9.02 “Wissen und Macht – Wissen als Macht?”: 122. Versammlung der Gesellschaft Deutscher Naturforscher und Ärzte, Martin-Luther-Universität Halle-Wittenberg
- 24.9.02 “Grundprobleme der Technikphilosophie”: Lehrerfortbildung der Bezirksregierung Düsseldorf, Haltern am See
- 11.10.02 “Universalitätsanspruch und kultureller Pluralismus”: Symposium der Karl Heinz Beckurts-Stiftung “Verwundbarkeit der wissenschaftlich-technisch geprägten Kultur”, Bonn
- 25.10.02 “Warum sollen wir überhaupt etwas und nicht vielmehr nichts?: Konferenz “Ursprung des Sollens” des Forums für Philosophie, Frankfurt/Main
- 4.11.02 “Ethische Aspekte des Handelns unter Risiko”: Kongress “eurosafe 2002” der Gesellschaft für Anlagen- und Reaktorsicherheit”, Berlin
- 25.11.02 “Lassen sich Katastrophen rational bewältigen?” 12. ZUFO Umweltsymposium “Epidemien und Seuchen: Eine Herausforderung für Wissenschaft und Gesellschaft?”, Universität Münster
- 6.12.02 “Der Ursprung des Sollens”: Philosophisches Seminar der Universität Bonn

***Gerd Hanekamp***

- 28.10.01 “Ethische Fragen an die moderne Naturwissenschaft”, Fachkolloquium des Tönissteiner Kreises, Maria Laach
- 31.1.–1.2.02 “Partizipation – Gestalterisch und reflexiv. Zu einer neuen alten Dimension wissenschaftlicher Politikberatung”, Tagung: Gestaltung und Reflexion – Wissenschaft und Technik in philosophischer Kritik, Universität Marburg

***Christian J. Langenbach***

- 20.3.01 “Von elektronischen Signaturen und dem notwendigen Vertrauen”, Vortragsreihe der Aktiengesellschaft Bad Neuenahr
- 25.3.01 “Elektronische Signaturen – Perspektiven interdisziplinär gestalten”, Forum Wir entwickeln Zukunft, Rheinland-Pfalz auf der CeBIT 2001
- 17.–19.10.01 “Electronic Signatures – How Future Needs Affect Today’s Decisions”, Congress “Innovations for an e-Society. Challenges for Technology Assessment, Berlin
- 6.9.02 “Die elektronische Signatur. Zum Scheitern verurteilt?“ Tagung Technische und gesellschaftliche Chancen der Informations- und Kommunikationstechnologien, Evangelische Akademie Iserlohn

***Miltos Liakopoulos***

- 3.–5.10.01 “Functional Foods: an interdisciplinary approach” (with Professor Ruth Chadwick) Eurosafe 2001 “Food Safety, Food Quality and Food Ethics”, The Third Congress of the European Society for Agricultural and Food Ethics, Florence, Italy
- 22.–27.7.02 Functional Foods and Psychological Dependency “International Justice in a Globalised World”, International Society for the Study of European Ideas, University of Wales Aberystwyth, UK
- 25.–26.9.02 Trust and functional foods; new products – old ways “The role of Trust and Responsibility in the AgroFood sector”, The Centre for Bioethics and Health Law of Utrecht University, The Netherlands

30.10–3.11.02 Golden Rice and Learned Helplessness – Developing the Wrong Kind of Psychology “6th World Congress of Bioethics”, Brasilia, Brazil

30.10–3.11.02 Functional Foods – Ethical Issues (with Dr. Doris Schröder) “6th World Congress of Bioethics”, Brasilia, Brazil

***Stephan Lingner***

23.1.01 “Klimawandel: Schicksal oder Herausforderung?” Lecture organised in co-operation with the Kurverwaltung Bad Neuenahr-Ahrweiler

30.5.01 “Klimadaten. Erhebungsproblematik und Aussagewertigkeit”; Lehrerfortbildungs-Seminar “Klimawandel und Waldschäden”, BLK-Programm “Bildung für nachhaltige Entwicklung”, Barweiler/Eifel

22.2.02 “Expertendiskurse. Erfahrungen aus einem interdisziplinären Klimaprojekt”, Workshop “Normativität und Unsicherheit” (Universität Stuttgart)

5.7.02 “Weltklima. Was verpflichtet uns zur Vorsorge?”. Vortrag und Diskussion, “Bonner Wissenschaftsnacht”, Universität Bonn

27.5.02 “Klimawissen und Klimahandeln”. Abendvortrag, “3. Deutscher IPCC-Strategie-Workshop”, Bad Münstereifel

18.09.02 “Klimawandel: Das Problem von Vorhersage und Vorsorge”. HGF-Programmausschuss “Systemanalyse und Technikfolgenabschätzung”, Wissenschaftszentrum Bonn

***Jeantine Lunshof***

28.9.01 Workshop “Euthanasie”, Kongress “Pflege&Ethik”, Universitätsklinikum Göttingen, Institut für Ethik und Geschichte der Medizin, Universität Göttingen

- 10.10.01 “Sterbehilfe versus Hospizbewegung”, Podiumsdiskussion Hospiz-Forum, Hospiz an der Lutter, Göttingen
- 13.10.01 “Ethische Aspekte der pränatalen Diagnostik”, Fortbildungsveranstaltung für Hebammen: “Guter Hoffnung sein... Aktuelle medizinische und ethische Aspekte der pränatalen Diagnostik”, Zentrum für Ethik in der Medizin am Markus-Krankenhaus, Frankfurt a.M.
- 7.11.01 “Sterbehilfe – Wann wird der Mediziner zum Täter?”, Podiumsdiskussion 10. Hallesche Tage des Rechts 2001, Ministerium der Justiz des Landes Sachsen-Anhalt und Juristische Fakultät der Universität Halle-Wittenberg, Halle
- 22.11.01 “Die Regelung der Euthanasie in den Niederlanden”, Ringvorlesung “Der sterbenskranke Patient”, Universitätsklinikum der Charité der Humboldt Universität, Berlin
- 10.3.02 “Sterbehilfe in den Niederlanden”, Rundfunkinterview, Medio-Radio, Hessen
- 15.3.02 “Sterbehilfe – Tod nach Plan?”, Podiumsdiskussion, Arbeitskreis Christlicher Kirchen, Marburg

***Ulrich Rehberg***

- 15.1.01 “Gesellschaftliche Aspekte des Naturschutzes in Verdichtungsräumen und die Methodik ihrer Erforschung”, Eidgenössische Forschungsanstalt Wald, Schnee und Landschaft, Abteilung Landschaft und Gesellschaft, Birmensdorf, Schweiz
- 15.11.01 “Scientific Political Consulting and Participation”, Universität Macerata

***Felix Thiele***

- 8.3.01 “Zukunftsforum Bio- und Gentechnologie”, Podiumsdiskussion 3. Biotechnologietage Bielefeld, Universität Bielefeld
- 14.3.01 “Ethical Problems of Genetic Testing – an Example”, Kamin-gespräch “Pharmacogenetics – risks and changes of individualized medicine and genetic testing”, Schering AG (Berlin)
- 27.4.01 “New Science – Forschen für den Profit?” Podiumsdiskussion des Symposiums 2001 des Heidelberger Clubs für Wirtschaft und Kultur, Heidelberg
- 15.5.01 “Embryonenforschung – Wie weit darf die Wissenschaft gehen?”, Riodiskussion während der Sendung “Redezeit”, NDR 4
- 23.7.01 “Ethische Fragen der Lebenswissenschaften”, Lehrveranstaltung für die Teilnehmer der Wissenschafts-Hotline im Rahmen des Wissenschaftssommers 2001, Berlin
- 28.10.01 “Predictive Medicine”, Symposium, Bio-Policy and the Place of Professional Ethics in Political Decision Making, GSK-Stiftung, Seon
- 7.11.01 “Humangenetische Diagnostik”, Wissenschaftliche Grundlagen und gesellschaftliche Konsequenzen, Vertretung des Landes Rheinland-Pfalz, Brüssel
- 14.11.01 Lebenswissenschaften Leit/d-wissenschaften des 21. Jahrhunderts?, Podiumsdiskussion, Urania, Berlin
- 17.11.01 “From Genomes to Cures”, Gene therapy: progress and prospects, Statement und Panel, Joint EMBO/EMBL conference on Science& Society, Heidelberg

- 23.11.01 “How far may science be allowed to go?”, Roundtable, 10th Anniversary Ernst Schering Research Foundation, Berlin
- 5.12.01 Gentechnik – Segen oder Fluch? Podiumsdiskussion veranstaltet durch den Trierischen Volksfreund, Trier
- 13.1.02 “Ethik und Politik”, Runder Tisch während der Veranstaltung “Für Europäische Grundwerte in der Bioethik” 11.–13.1.2002, Berlin-Brandenburgisches Institut für Deutsch-Französische Zusammenarbeit in Europa, Genshagen
- 5.2.02 “Der gläserne Mensch”, Wissenschaft in der Gesellschaft. Runder Tisch während der Prager Wissenschaftsgespräche 4.–5.2.2002 Goethe Institut Prag
- 13.6.02 “Bioethik & Biopolitik”, Forschungstag der medizinischen Fakultät der Universität Essen
- 3.7.02 “Grundbegriffe der Bioethik”, Franz-Haniel-Gymnasium, Duisburg
- 15.7.02 “Bio-Politik und die Bedeutung der professionellen Ethik für die politische Entscheidungsfindung”, Graduiertenkolleg am IWT, Bielefeld
- 26.9.02 “Ethische Grenzen der Patentierung”. XIX. Deutscher Kongress für Philosophie, Bonn
- 5.10.02 “Science-Policy and the Place of Professional Ethics in Political Decision-Making”. The 6<sup>th</sup> Meeting of the Pittsburgh-Konstanz Colloquium in the Philosophy of Science, 3.–6. October, Pittsburgh
- 18.11.02 “Bioethis. Theory & Application”. Vortrag im Rahmen der Einführungswoche für die neuen Ph.D. Studenten am European Molecular Biology Laboratory, Heidelberg

## **5. Teaching Activities**

### ***Michael Decker***

SS 2002                      Lecture: Technikfolgenabschätzung  
Fachhochschule Koblenz

WS 2002/03                Lecture: Technikfolgenabschätzung  
Fachhochschule Koblenz

### ***Carl Friedrich Gethmann***

WS 2000/01                V   Einführung in die Logik (with Th. Sander)  
  
OS Universalismus und Partikularismus (with  
B. Gräfrath und Th. Sander)  
University Essen

SS 2001                    OS Argumentationstheorie (with B. Gräfrath  
und Th. Sander)  
University Essen

WS 2001/02                V   Grundlagen der Ethik und Angewandten  
Ethik  
  
V   Einführung in die Logik (with Th. Sander)  
  
OS Wissenschaftsethik (with B. Gräfrath und  
Th. Sander)  
University Essen

SS 2002                    OS Bedeutungstheorien  
University Essen

WS 2002/03                V   Einführung in die Angewandte Philosophie  
  
OS Selbstbestimmung und Zumutbarkeit (with  
B. Gräfrath und Th. Sander)  
University Essen

***Christian Langenbach***

- WS 2000/01            Lecture and Exercise:  
Einführung in die Informatik I,  
FH Koblenz, Remagen
- SS 2001                Lecture and Exercise:  
Einführung in die Informatik II,  
FH Koblenz, Remagen
- as of WS 2001/02    Lecture and Exercise:  
Einführung in die Informatik I und II,  
FH Koblenz, Remagen
- as of SS 2002         Lecture and Exercise:  
Einführung in die Informatik I und II,  
FH Koblenz, Remagen

***Stephan Lingner***

- as of WS 2000/01    Lecture/Seminar: Vorlesung/Seminar Ökologie,  
FH Koblenz, Remagen

***Rupert Leitner***

- WS 02/03             Introduction into Business Economics,  
FH Koblenz, Remagen

***Felix Thiele***

- SS 02                 Proseminar: Einführung in die Bioethik (Intro-  
duction to Bioethics).  
Teaching assignment at the institute of philoso-  
phy at the Gerhard Mercator University Duis-  
burg
- WS 02/03             Proseminar: Ethik & Globalisierung (Ethics &  
Globalisation)  
Teaching assignment at the institute of philoso-  
phy at the Gerhard Mercator University Duisburg

## **6. Qualification Plan**

### **6.1 Habilitation**

#### *6.1.1 Felix Thiele*

Dr. med. Felix Thiele, M. Sc. is preparing a study in the area of medical ethics.

#### *6.1.2 Gerd Hanekamp*

#### **An Action-based Approach to Business Ethics**

To integrate empirical, functional and ethical considerations is a key task of business ethics. Any bias towards one of these aspects diminishes the expediency of the corresponding results for business and policy decisions. The project outlined here is supposed to find a way to achieve this integration starting from an action-based perspective.

To act in a business or policy context means to act within a framework of explicit and implicit rules, norms and agreements. These thus have to be determined in order to discuss particular actions. Here basic issues of the philosophy of the social sciences as well as of social and political philosophy have to be treated in detail.

This more theoretical effort is followed by the more practical part of the project. Here the reflection of one's actions as well as of the corresponding rules, norms and agreements in business and policy contexts is discussed. A key factor is the consideration of individual availabilities ('Disponibilitäten').

#### *Publication*

Kulturalistische Unternehmensethik. Ein Programm (2001) In: *Zeitschrift für Wirtschafts- und Unternehmensethik* 2. Jahrg., Heft 1

## **6.2 Ph.D. Programme**

*Minou-Bernadette Friele*

### **On the Legitimacy of Supranational Law in Europe**

Commercial, scientific and private interactions and co-operations are increasingly conducted across national borders. Well known examples for this process can be found in the sphere of biomedicine – starting from the so-called abortion-tourism up to the recent debate on the import of human embryonic stem cell lines. This tendency to cross cultural-moral and legal borders respectively raises questions of the moral and legal legitimacy of such international actions and of the legitimacy of national and international regulations to regulate them.

Considering the traditional discussion of the relation between morals and the law within the Philosophy of Law and the more recent debate in political philosophy between liberals and communitarians, the study deals with the scope and limits of institutionalised power. In view of the described inter- and transnational actions and with regard to the development of a European Law, the scope and limits of international norms addressed to already existing sovereign states deserve equal consideration.

The investigation aims at making a philosophical contribution to some of the current socio-political developments of the European unification.

The dissertation by Minou Bernadette Friele is supervised by Professor Dr. Dieter Birnbacher at the Institute for Philosophy at the University of Düsseldorf.

*Ulrike Henckel*

### **Anthropological Basics of Medical Ethics**

The modern demand for basing medical ethics on an anthropological foundation to govern the actions of the physician is based on understand-

ing the human being as an actor. This anthropology aims at an integrale definition of human beings and has to be the basis also for medicine as a natural, human science. The aims of medical actions have to be discussed and the pertinent medical techniques have to be subordinated to them.

The example will be the relationship between the physician and the patient, particularly the relationship between the physician and the patient who is not able to decide for himself. This requires a concept of tutorial action.

The dissertation ‚Anthropological Basics of Medical Ethics‘ in philosophy by Ulrike Henckel will be prepared at the Institute of Philosophy of the FernUniversität Hagen and supervised by Professor Dr. Annemarie Gethmann-Siefert.

*Ulrich Rehberg*

### **Potentials of the Integrated Nature Protection in a Densely Populated Area. A Case Study in the Region Koblenz-Neuwied, Germany**

In this project, the conditions for the application of integrated nature protection have been investigated using the example of the densely populated area of Koblenz-Neuwied. The concept aims at nature protection on larger spatial scales. Similarly, the goals of integrated nature protection are to care for those areas that are under economic use, e.g. agricultural areas or gravelpit operations. The integration is considered as an important contribution to a development in sustainable landuse management. The methods comprised an analysis of the biogeographic conditions in the investigated area and a socio-ecological analysis of the specific interests and social constraints of the users of the landscape.

The specific questions for the analysis were:

- Which dangers exists for the natural parts in the investigated area and which uses cause these dangers? Which factors prevent integrated nature protection?

- Which potentials for revaluation exists for the natural parts and which potentials for revaluation have the user groups?
- Which valuable natural parts have to be conserved and which valuable natural parts could be conserved with the help of the user groups?
- Which natural parts have to be designed for revaluation and which natural parts could be designed with the help of the user groups?

The analysis of the biogeographic conditions comprised a biogeographic inventory of the investigated area and an intensive investigation of exemplary natural parts. This included:

- a detailed mapping of biotopes in seven representative parts (with areas of 25 ha).
- a mapping of birds, amphibians and grasshoppers (*ensifera* and *caelifera*) as biodecriptors.

The representation and evaluation was supported by a Geographic Information System.

The analysis of the specific interests and social constraints of the users of the landscape comprised an inventory of the different land uses and competitive utilisation and an intensive investigation of the following exemplary landscape uses with sociological methods (interviews):

- areas used for agriculture,
- areas used for recreation and leisure time,
- areas used for obtaining drinking water.

Recommendations for a development in sustainable landuse management in the investigated area were derived from the results of the analyses. The recommendations comprised (e.g.):

- to develop the protection of drinking water in areas used for recreation and the enjoyment of nature, especially by children, with extensively

cultivated biotopes, willow groves and biotopes that are typical for areas along the banks of rivers.

- to stop the afforestation of protected areas designated for the regeneration of drinking water and at the same time to allow their extensive agricultural use,
- to establish separate zones for recreation and leisure time, on the one hand, and for nature protection, on the other hand,
- to support the participation of the farmers in the agricultural environmental programmes (VO (EWG) 2978/92) by means of appropriate measures.

The results of the project were submitted as a doctoral thesis to the Ruprecht-Karls-Universität Heidelberg under the supervision of Professor Dr. H. Karrasch, department of Geography in autumn 2002.

*Jorge Guerra Gonzalez*

### **Xenotransplantation: Informed Consent as a Means to Reduce the Xenozoonosis Risk. A Comparative Study of the German and Spanish Law**

Xenotransplantation – defined as the transfer of living material between species – is a therapeutical hope for millions of patients worldwide.

If we reduce the scope of this definition to the transplantation of animal organs into human beings, then we face the most controversial field of this new medical technique from almost any point of view: medical, juridical, ethical, economical, etc. Since, on the one hand xenotransplantation could improve the health of an enormous number of patients on organ waiting lists – which would raise, at the same time, questions of allocation, costs and consequences on organ donation (among many others); but on the other hand, it would endanger the whole human population, given that the implantation of an animal organ in a human being could be a source of new infections, which could give place to xenozoonotic pandemics.

This danger is a real possibility for different reasons: because xenotransplantation would “per se“ overcome some of the natural protection barriers of the organism against pathogens (skin, mucosa, etc.), because the patient is immunosuppressed so that his body does not reject the graft and because some pathogens in the animal organ (endogenous retroviruses or ERVs), which are objectively transmissible to human cells, cannot nowadays be eliminated. If we consider finally that epidemics like AIDS or ebola have an animal origin (zoonosis) and that a lot of germs in the graft are unknown and could transform or react in the human body and become pathogens, then it is easy to deduce that xenotransplantation exposes the human population to a certain risk – that cannot be quantified a priori.

Assuming that the main obstacles to the feasibility of xenotransplantations (immunology and physiology) are removed, a political decision (with the broadest possible influence area) should take place, opening xenotransplantation for the therapeutical practice or prohibiting it – if the (infection) risk for the whole population outweighs its multiple chances.

If, as it seems today, the benefits of the technique are decisive for a positive outcome, the question would be to try to reduce that infection risk as much as possible. It has been proposed that the patient and/or his close contacts should agree prior to the transplantation to observe some protection measures (monitoring, periodical biopsy, avoidance of body fluids interchange, mobility control, etc.). If these measures are rejected, no xenotransplantation should be carried out.

The dissertation by Jorge Guerra González considers the legal acceptability of this proposal according to the German and Spanish Law. It is supervised by Professor Jürgen Simon (University of Lüneburg, Germany) and Professor Carlos Romeo Casabona (University of Deusto, Spain).

*Klaus-M. Seel*

### **Explanatory Schemata and Theoretical Structures in Genetics from the Perspective of the Philosophy of Science**

There is hardly another discipline that is so much at the centre of current social interest as genetics. For one thing, this is because the discovery of

new scientific knowledge is continuing to proceed at such a rapid pace, and for another, because of the enormous need for discussion on the ethical justification of its application. In all of this, the intensity of the discourse is understandable in that it is not merely a matter immediately concerning the existence and development of our own species but of all species. Since now that manipulation on the genetic level has become possible, mankind has entered upon a qualitatively new stage of evolution. The PhD project is not chiefly concerned with participating in the bioethical debate over ethical consequences, but rather is focussed gaining information as to what knowledge is currently available and what forms of manipulation are possible today, as well as to prognosticate what will be feasible in the future. Based upon this, the questions shall be discussed to what extent a living being is determined by its genome, how one should deal with genetic tests and in what way the Embryo Protection Law is in need of amendment. The interdisciplinary dissertation will be attended by Professor Dr. Georg H. Fey (professorship in genetics), Professor Christian Thiel (professorship in philosophy) and Acad. Dir. Dr. Rudolf Kötter (Interdisciplinary Institute for Scientific Theory and Scientific History) at the Friedrich-Alexander- University, Erlangen-Nürnberg.

## **7. Research Fellowship Programme**

The integration of European perspectives into its research is a goal that the Europäische Akademie is pursuing by several means. The Academy has approached this goal mainly by inviting European and International Scientists to participate in project groups and in interdisciplinary conferences. Since the beginning of the year 2000 the Europäische Akademie has added a further tool for improving the implementation of the European perspective in its work by offering a *Research Fellowship Programme*.

This new programme allows appropriately qualified foreign scholars to carry out research projects in the field of the study of consequences of sci-

entific and technological advance at the Europäische Akademie in Bad Neuenahr-Ahrweiler. Research fellowships for a stay between 3 and 6 months are offered on a competitive basis to Europe-based scholars. Main selection criteria are the applicant's qualifications and the relatedness of the proposed projects to the scientific work of the Europäische Akademie. Successful applicants will be awarded a Honoraria/Scholarship depending on experience and qualifications.

In 2001, Dr. Michael Selgelid from Monash University, Australia, was awarded a fellowship for the period 5<sup>th</sup> February–5<sup>th</sup> June 2001. Dr. Selgelid's background has been in the area of Bioethics and he has specialised in "Societal Decision Making and Genetics". His work at the Europaeische Akademie revolved around the area of "Eugenic abortion, moral uncertainty, and social consequences".

In 2002, Professor Andrzej Kaniowski from the University of Lodz, Poland, and Dr. Doris Schröder from Lancaster University, UK, were awarded fellowships at the Akademie. Professor Kaniowski's academic background has been in the areas of "moral sciences, social philosophy and ethics" where he has published widely. He is also the main translator of Habermas' work in Polish. His fellowship at the Akademie covered the period 1<sup>st</sup> August–20<sup>th</sup> October 2002 and his work concentrated on the area of "Philosophical analysis of arguments justifying (or having to justify) legal regulations in the area of medicine and biotechnology".

Dr. Schröder's academic background has been in the areas of "formal logic, ethics and political philosophy" where she has also published widely. Her fellowship at the Akademie covered the period 29<sup>th</sup> August–29<sup>th</sup> November 2002 and her work included editing the forthcoming book on "functional foods" as well as the areas of "propositional logic", "just war theory" and "Homo Economicus".

Contact: Miltos Liakopoulos, Ph. D.  
miltos.liakopoulos@dlr.de

## **8. Colloquium of the Europäische Akademie**

- 11.6.01 Joachim Schmidt-Bisewski: Umweltbildung – Der Weg nach Arkadien?
- 10.9.01 Ulrich Rehberg: Die Biodiversitätskonvention und andere Rahmenwerke zum Umweltschutz
- 27.9.01 Professor Dr. Carl Friedrich Gethmann: Zur Stammzellenproblematik
- 2.10.01 Professor Udo Schüklenk, PhD., University Johannesburg: Current controversies in international research ethics
- 3.12.01 Dr. Andreas Hüttemann, University Bielefeld: Zur Deutungsmacht der Biowissenschaften
- 4.2.02 Dott. Rupert Leitner: Nichtwissen in der Technikfolgenbeurteilung
- 14.2.02 Ulrike Henckel: Anthropologische Grundlagen angewandter Ethik unter besonderer Berücksichtigung der medizinischen Ethik
- 16.5.02 Professor Dr. Marco Buzzoni, University Macerata: Wissenschaftstheoretische Probleme der Medizin als Humanwissenschaft
- 10.10.02 Professor Dr. Andrzej Kaniowski: Gattungswürde – ein Schnittpunkt des Biologischen und des Moral-Ethischen
- 21.11.02 Dr. Doris Schröder: Ben Mephams “Ethische Matrix” – ein kritischer Kommentar

## 9. Scientific Cooperation

The cooperation between the Europäische Akademie and other scientific institutions is implemented especially within the interdisciplinary working groups. As a result of these cooperations, several conferences have been organised together with other scientific institutions. Further cooperations are described in the following.

### 9.1 Institutional Collaboration

#### **Berlin-Brandenburgische Akademie der Wissenschaften (BBAW)**

Project “Gesundheitsstandards” (Health Standards): The BBAW established a working group on the topic “Gesundheitsstandards”. Speaker of the working group is Professor Dr. Carl Friedrich Gethmann.

Project Assistant:           Dr. med. Thomas Krause (until 15.4.01)  
  Drs. (NL) Jeantine E. Lunshof (from 15.6.01)

Cooperations for scientific collaboration and exchange were contracted with the **University Slaski, Katowice (Polen)** as well as with the **Higher School of Management and Social Sciences, Tichy (Polen)**,

#### **Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Forschungszentrum Karlsruhe**

On 25 January 2001 a symposium on “Integrative Modellierung des Globalen Wandels” was organised in Bad Honnef within the framework of a cooperation with ITAS (Professor Dr. Grunwald) and the TA-Akademie in Baden-Württemberg (Professor Dr. Renn). The results of the conference were published as volume 17 of the Springer Series “Wissenschaftsethik und Technikfolgenbeurteilung”: C. F. Gethmann/S. Lingner (eds) *Integrative Modellierung zum Globalen Wandel* (2002). This publication project was supported by the “Bundesministerium für Bildung und Forschung”.

### **Institut für Schulische Fortbildung und Schulpsychologische Beratung (IFB), Boppard**

Participation in the training seminar “Klimawandel und Waldschäden” with a lecture on “Klimadaten. Erhebungsproblematik und Aussagewertigkeit” (Dr. Stephan Lingner).

### **Junge Akademie**

Dr. Felix Thiele is member of the project group “Deutungsmacht der Biowissenschaften“ of the Junge Akademie (Berlin).

### **Nationale IPCC Koordinierungsstelle des BMU und des BMBF beim DLR**

The cooperation was on participation at the “3. Deutscher IPCC-Strategie-Workshop” on 27/28 May 2002 in Bad Münstereifel. Dr. S. Lingner was invited to give an evening lecture on “Klimawissen und Klimahandeln” with respect of the recently published results of the academy’s project “Klimavorhersage und Klimavorsorge”.

## **9.2 Membership in Networks**

- European Association of the Study of Science and Technology (EASST)
- Deutsches Netzwerk Wirtschaftsethik (dnwe)/European Business Ethics Network (EBEN)
- American Association for the Advancement of Science (AAAS)
- European Ethics Network
- Arbeitskreis “Technikfolgenabschätzung und -bewertung” des Landes Nordrhein-Westfalen (AKTAB) (in Person von Professor Dr. C. F. Gethmann)

- European Society for Philosophy of Medicine and Health Care (ESPMH)
- HGF-Programmausschuss “Systemanalyse und Technikfolgenabschätzung”

## 10. Regional Activities

### 10.1 Lecture Events in Cooperation with the KSK Ahrweiler

- 13.3.2002      Professor Dr. rer. pol. Ulrich Steger (IMD International Institute for Management and Development, Lausanne)
- “Nachhaltige Entwicklung und Innovation in einer globalisierten Wirtschaft”
- SETA Hotel, Bad Neuenahr, Germany
- 5.12.2002      Professor Dr. Klaus-Dirk Henke (Technische Universität Berlin)
- “Ist unser Gesundheitssystem noch bezahlbar?”
- SETA Hotel, Bad Neuenahr, Germany

### 10.2 Lectures in the Scope of the Cure-Programm (Kurprogramm)

- 23.1.2001      Dr. Stephan Lingner: “Klimawandel. Schicksal oder Herausforderung?”

### 10.3 Press Conference

- 12.7.2001      Topics: “The Latest Developments of the Work of the Europäischen Akademie” and “Project Robotic”, Europäische Akademie, Bad Neuenahr-Ahrweiler

## 10.4 Working Group “Medical Ethics”

Since 1998 the Europäische Akademie has organised a working group on Medical Ethics, *Arbeitskreis Medizinethik*, for the medical doctors and other health professionals from the greater Bonn and Ahrtal area. Evening meetings of the working group are offered bimonthly and are a platform for information and discussion about current issues in medical ethics and health law. To realise its goal of advancing the interdisciplinary discourse between the professions, the working group invites leading experts in health related sciences and policy to give a lecture followed by discussion with the invited participants and members of the academy’s scientific staff. Relevance for actual medical practice in hospital and outpatient care is an important feature of the issues that are being dealt with in an interdisciplinary approach.

### 2001

- 8.1.01            In-vitro-Fertilisation: In-vitro-Fertilisation – Diktat der Zeugung und Auslese, Dr. Carmen Kaminsky
- 12.3.01            Begriffe in Medizin, Recht und Ethik: Über “Tun” und “Unterlassen”, Dr. Barbara Guckes
- 14.5.02            Sterbehilfe: Rechtliche Aspekte der Behandlung Schwerstkranker bei irreversiblen Schädigungen, Klaus Kutzer
- 10.9.01            Sterbehilfe: Die niederländische Regelung zur Sterbehilfe unter besonderer Berücksichtigung der Position des Arztes, Jaap J. Visser
- 15.11.01            Aufklärung & Einwilligung, Professor Dr. J. Vollmann

### 2002

- 14.1.02            Der Paternalismus und seine Rolle in der Medizin, Professor Dr. F.-W. Eigler

- 13.5.02 Aufklärung und Einwilligung. Pflicht des Arztes und Recht des Patienten – Fallbeispiele aus der Rechtspraxis, Paul Wagner, vors. Richter am Landgericht Bonn
- 9.9.02 Anonyme Geburt: Babyklappe und Anonyme Geburt – Hintergründe und ethische Probleme, Dr. Gisela Bockenheimer-Lucius
- 11.11.02 Terminale Sedierung: Kasuistik, medizinische und ethische Aspekte, Dr. Dietmar Beck, Drs. (NL) Jeantine Lunshof

## 10.5 Vernissage

### 2001

- 22.3.01 Karsten K. Panzer: “consequenzen”
- 10.5.01 Andreas Helmer: “Bilder”
- 20.9.01 Thomas Hannibal: “Malerei”

### 2002

- 21.3.01 Bobo Kriechel: “Bilder”
- 20.6.01 Beate Leisten: “Bilder”
- 24.10.01 Sabine Bachem: “Bilder, Plastiken Fotografien”

## 10.6 Further Activities

*Bonner Transferkreis*: Network of research and development institutions on the regional level. The Europäische Akademie is member of this network, which offers mutual information and cooperation.

*Innovations for an e-Society*: Congress on the topic “Innovations for an e-Society for Technology Assessment” in Berlin from 17.–19.10.2001.

The Europäische Akademie participated in the Congress with an information stand and the following lectures:

- Christian J. Langenbach: “Electronic Signatures – How Future Needs Affect Today’s Decisions”
- M. Decker (with K. Lauterbach, M. Lindlar): “Cost-Benefit-Analysis of Telemedicine. First Steps to an Interdisciplinary Technology Assessment“

*Scientists and science in the media:* The Europäische Akademie GmbH organised a council meeting with a panel discussion on the topic “Scientists and Science in the media“ in Ahrweiler on 25.02. 2002.

*Summer School of the German National Merit Foundation, 4.–16.08.2002 in Ftan, Switzerland:* The director of the academy, Carl Friedrich Gethmann, as well as two of his co-workers, Michael Decker and Gerd Hanekamp, were invited to teach at the Summer School of the German National Merit Foundation in Ftan, Switzerland (August 4–16, 2002). The students were introduced to different forms of scientific policy consulting and were subsequently able to perform an interdisciplinary effort based on one of the academy’s study reports (Environmental Standards).

*Wissenschaftsnacht Bonn:* The “Bonner Wissenschaftsnacht“ was organised in Bonn on 05.07.2002 by the “Strukturförderungsgesellschaft Bonn/Rhein-Sieg/Ahrweiler (SFG)“, the University of Bonn, the “Deutsche Museum Bonn“ und the “Stifterverband für die deutsche Wissenschaft“ in cooperation with numerous regional research institutes. The aim was to foster the dialogue of research institutions of the Bonn region with the public and its understanding of science. On this occasion, a wide range of research institutes located in the region of Bonn presented the results and publications of selected research works. The Europäische Akademie participated in the “Wissenschaftsnacht“ with an information stand and a contribution to the discussion on the topic “Weltklima. Was verpflichtet uns zur Vorsorge?“.

## **V. Appendix**

### **1. Managing Committee**

State Secretary Roland *Härtel*, Ministerium für Bildung, Wissenschaft und Weiterbildung, Weiterbildung, Forschung und Kultur Rheinland-Pfalz (Chair since 2002)

Regierungsrat Reinhold *Bott*, Ministerium der Finanzen Rheinland-Pfalz

Professor Dr.-Ing. Sigmar *Wittig*, Deutsches Zentrum für Luft- und Raumfahrt e.V., Köln-Porz

Dr. Kai-Uwe *Schrogl*, Deutsches Zentrum für Luft- und Raumfahrt e.V., Köln-Porz

### **2. Scientific Advisory Board**

Professor Dr. rer. pol. Carl *Böhret*, Speyer (Chair)

Professor Dr. phil. Peter *Fricker*, Bern (CH)

Professor Dr. med. Detlev *Ganten*, Berlin

Priv.-Doz. Dr. Ursula-Friederike *Habenicht*, Berlin

Dr.-Ing. Margarete *Hofmann-Antenbrink*, Pully (CH)

Professor Dr. W. J. *Geysen*, Leuven (B)

Professor Dr. jur. Peter *Marburger*, Trier

Professor Dr. phil. Jürgen *Mittelstraß*, Konstanz

Professor Dr. rer. pol. Herbert *Paschen*, Berlin

Professor Dr. phil. Josef *Reiter*, Mainz

### 3. Council

Professor Dr. Wouter *Achterberg* †, Amsterdam

Priv.-Doz. Dr. Rudolf *Amann*, Bremen

Dr. phil. nat. Klaus *Ammann*, Bern

Professor Dr. sc.phil. Gerhard *Banse*, Karlsruhe

Professor Dr. med. Claus R. *Bartram*, Heidelberg

Dr. jur. Helmut *Bäumler*, Kiel

Professor Dr. phil. Jan P. *Beckmann*, Hagen

Professor Dr. Jos *Berghman*, Leuven

Professor Dr. Kornels *Blok*, Utrecht

Professor Dr. Deryck *Beyleveld*, Sheffield

Professor Dr. med. Dr. rer. nat. Hermann M. *Bolt*, Dortmund

Professor Dr. med.vet. Dr. med.vet.habil. Dr. h.c. Gottfried *Brem*, Wien

Professor Dr. rer. pol. Friedrich *Breyer*, Konstanz

Professor Dr. rer. pol. Dieter *Cansier*, Tübingen

Professor Dr. rer. nat. Martin *Claussen*, Potsdam

Professor Dr. rer. nat. Thomas *Christaller*, Sankt Augustin

Professor Dr. jur. Jos *Dumortier*, Leuven

Professor Dr. med. Friedrich W. *Eigler*, Essen

Professor Dr. rer.nat. Georg *Fey*, Erlangen

Professor Dr. phil. Christa *Fonatsch*, Wien

Professor Dr. jur. Walter *Frenz*, Aachen

Professor Dr. Harald *Fuchs*, München

Dr. jur. Riccardo *Genghini*, Mailand

Professor Dr. med. Joachim *Gilsbach*, Aachen

Professor Dr. rer. nat. Armin *Grunwald*, Karlsruhe  
Professor Dr. agr. Robert *Guderian*, Essen  
Professor Dr. rer.nat. Dr. habil. Walter H. *Günzburg*, Wien  
Dr. Per *Hall*, M.D., Ph.D., Stockholm  
Professor Dr. med. Dr. med. vet. Claus *Hammer*, München  
Professor Dr.-Ing. Helmuth *Harig*, Bremen  
Priv.-Doz. Dr. Jan Georg *Hengstler*, Mainz  
Professor Dr. med. Dietrich *Henschler*, Würzburg  
Professor Dr. rer. nat. Andreas *Hense*, Bonn  
Dr. Spencer *Henson*, Guelph  
Professor Dr.-Ing. Gerd *Hirzinger*, Oberpfaffenhofen  
Professor Dr.-Ing. Heinrich *Hofmann*, Lausanne  
Professor Dr. Jacek *Holòwka*, Warschau  
Professor Dr. sc. nat. Dieter *Imboden*, Zürich  
Professor Dr. phil. Dr. theol. Bernhard *Irrgang*, Dresden  
Dr. rer. nat. Peter *Jacob*, Neuherberg  
Professor Dr. phil. Peter *Janich*, Marburg  
Professor Dr. rer.nat. Wolfgang *Kaysser*, Köln  
Professor Dr. phil. habil. Andrzej *Kiepas*, Katowice  
Professor Gernot *Klepper*, Ph.D., Kiel  
Dr. Gerrit *Koenen*, Den Haag  
Professor Dr. rer. pol. Rudi *Kurz*, Pforzheim  
Professor Dr. med. Dr. sc. Karl *Lauterbach*, Köln  
Professor Dr. Hans *Lilie*, Halle  
Professor Dr. Robin *Lovell-Badge*, London

Professor Dr. jur. Bernd *Lutterbeck*, Berlin  
Professor Dr. Weyma *Lübbe*, Leipzig  
Dr. phil. Petr *Machleidt*, Prag  
Priv.-Doz. Dr. Ulrich *Martin*, Hannover  
Professor Dr. Bernd *Baron von Maydell*, München  
Professor Dr. Cees *Midden*, Eindhoven  
Professor Dr. Beran *Moseley*, Reading  
Professor Dr. med. Dr. med.dent. Dr. h.c. Wolfgang *Müller-Ruchholtz*,  
Kiel  
Professor Dr. phil. Konrad *Ott*, Greifswald  
Professor Dr. Deborah *Oughton*, Ph.D., Aas/Oslo  
Professor Dr. Günther *Patzig*, Göttingen  
Professor Dr. rer. nat. Andreas *Pfitzmann*, Dresden  
Professor Dr. med. Gerald *Pöch*, Graz  
Professor Dr. jur. Eckard *Rehbinder*, Frankfurt a. M.  
Professor Dr. rer. pol. Ortwin *Renn*, Stuttgart  
Professor Dr.-Ing. Rainer *Renz*, Kaiserslautern  
Professor Dr. phil. Georg *Rudinger*, Bonn  
Professor Dr. rer.nat. Heinz *Saedler*, Köln  
Professor Dr. rer.nat. Günther *Schmid*, Essen  
Professor Dr. rer. pol. Dieter *Schmitt*, Essen  
Professor Dr. jur. Dr. h.c. Hans Ludwig *Schreiber*, Göttingen  
Professor Dr. jur. Meinhard *Schröder*, Trier  
Professor Dr. jur. Dr. soc. oec. Erich *Schweighofer*, Wien  
Professor Dr.-Ing. Gerhard *Schweitzer*, Zürich  
Professor Dr. Davor *Solter*, M.D., Ph.D., Freiburg

Detlev *Sprinz*, Ph.D., Potsdam  
Professor Dr. rer. pol. Ulrich *Steger*, Lausanne  
Professor Dr. Fritz F. *Steininger*, Frankfurt a. M.  
Professor Dr. rer.nat. Dr. h.c. Christian *Streffler*, Essen  
Professor Dr. phil. Dieter *Sturma*, Essen  
Dr. phil. Elisabeth *Swaton*, Wien  
Professor Dr. jur. Jochen *Taupitz*, Mannheim  
Dr. rer. nat. Michael *Türkay*, Frankfurt a. M.  
Dr. rer. pol. Otto *Ulrich*, Bonn  
Professor Dr. sc. pol. Reinhard *Voßbein*, Wuppertal  
Professor Dr. Rüdiger *Wolfrum*, Heidelberg  
Professor Dr. rer. pol. Thomas *Ziesemer*, Maastricht  
Professor Dr. Maciej *Zukowski*, Poznan

## 4. Staff

### Management

Professor Dr. phil. Carl Friedrich *Gethmann*  
(Director)

Studies of philosophy at the universities of Bonn, Innsbruck and Bochum; 1968 lic. phil. at the Institutum Philosophicum Oenipontanum; 1971 was conferred the Doctor of Philosophy degree at the Ruhr-University of Bochum; 1978 habilitation for philosophy at the Universität Konstanz. 1968 assistant professor; 1972 lecturer in philosophy at the University of Essen; 1978 private lecturer at the Universität Konstanz; 1979 professor of philosophy at the Universität Essen; other professorships at the universities of Düsseldorf and Göttingen; was offered full professorships at the

Universität Oldenburg (1990; refused), at the Akademie für Technikfolgenabschätzung in Stuttgart (1991; refused) as well as at the Universities of Essen (1991; accepted), Konstanz (1993; refused) and Bonn (1995; refused); director of the Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen in Bad Neuenahr-Ahrweiler (since 1996); member of the Academia Europaea (London); ordinary member of the Berlin-Brandenburgische Akademie der Wissenschaften. Elected member of the “Deutsche Akademie der Naturforscher Leopoldina“ (Halle) (section: Philosophy of Science).

Dr. med. Felix *Thiele*, M.D., M.Sc.  
(Vice-Director)

Studied medicine at the universities of Hamburg and Heidelberg. He was awarded a doctoral degree in 1997 for experimental work in the field of high blood pressure research. He studied philosophy at the University of Heidelberg (1995/96) and the London School of Economics (1996/1997), where he was awarded a Master of Science in Philosophy and History of Science. 1997–1998 he worked at the Max-Delbrück-Center for Molecular Medicine Berlin-Buch in the field of science management. Since July 1998 he works at the Europäische Akademie; he is manager of the project “Human Genetics. Ethical Problems and Societal Consequences“ and member of the study group “Practical Philosophy“. Since October 1999 he is vice-director of the Europäische Akademie.

Dipl.-Kfm. Petra *Hermann*  
(Chief Financial Executive and Assistant to the Director)

Studied economics and business at the universities of Bonn and Erlangen-Nürnberg, 1993 Dipl.-Kfm., 1994–1996 management assistant at the Leipziger Wohnungs- und Baugesellschaft, since May 1996 personal assistant to the director of the Europäische Akademie, responsible for administrative and financial affairs. She manages the working group “Medical Ethics“, the vernissages and the non-profit association “Sponsors of the Europäische Akademie“.

## Organisation and Administration

*Kerstin Grosser*

(Editing, Public Relations)

1980–1982 training in mechanical engineering drawing; 1982–1985 study at the Technical College for Heavy Mechanical Engineering in Roßwein, 1985–1991 part-technical designer in the heavy engineering Lauchhammerwerk; 1991–1993 vocational training as office clerk and sole employee in the small enterprise; 1993–1997 family phase; 1997–2001 office clerk in small enterprises, 2001 qualification seminar MS Office User Specialist; Since February 2002 maternity representation for Friederike Wütscher in the field of scientific editing and public relations.

*Maria Icking*

(Accounting)

1995 termination of the study of business economics with the main emphasis on data processing; 1988–1997 managerial tasks in an orthopaedic practice followed by an employment with the director of the Department of Clinical Pharmacology at the University of Bonn as well as with a private clinic in Bonn (the GOC Verwaltung mbH); since October 1999 member of staff at the Europäische Akademie, responsible for wages and financial accounting, payments and costing.

*Camilla Jahr*

(General Administration)

1970–1975 Study of Anglistics and Romance languages and literatures at the universities in Freiburg and Münster. 1976–1977 Teaching training at the secondary school “Albert-Schweizer-Realschule” in Krefeld. 1978–1979 Training course at the Bénédict School in Dortmund to become a correspondence clerk in English and French. 1980–1981 Secretary with different firms in Libya and Algeria. 1981–1982 Correspondence clerk with Rhestahl Technik GmbH, Düsseldorf. 1983–1986 Family break. 1986–2001 Secretary with different international firms. Since November 2001 commercial clerk with the Europäische Akademie GmbH.

Dipl.-Päd. Sevim *Kiliç*  
(Editing, Public Relations)

1992–1994 Education for Commercial Correspondent for Foreign Languages (English and French), afterwards employment at Rogge Marine Consulting GmbH for one year. 1995–2001 Diploma in Paedagogic, Psychology and Sociology at the University of Mainz. 1997 Collaboration with the MPI Mainz for carrying out congresses about earth-sciences in Heidelberg and Strasbourg. 1998–2002 work for the news department of the SWR in Mainz. Since April 2002 substitute for Friederike Wütscher and responsible for editing and public relations at the Europäische Akademie.

Daniela *Nies* (on maternity leave)  
(General Administration)

1983 certificate of apprenticeship in the carpenter trade; 1986 education to the “Betriebswirtin des Handwerks“ (management expert of trade by the chamber of handicrafts); 1990 final examination as office clerk, 1992 aptitude test as instructor, 1996 final examination as foreign correspondence clerk in English; 1992–1996 personal assistant of the Secretary General of the Professional Association of German Psychologists; since January 1998 employee of the Europäische Akademie, main fields of work: management of the central office, conference organisation of workshops and project team meetings, official in charge for the personal files, processing of travelling expenses invoice.

Margret *Pauels*, Diplom-Übersetzerin  
(Reception, Guest Relation)

1965–1969 studies of English and French at the Auslands- und Dolmetscher-Institut Germersheim der Universität Mainz (Institute for Interpreters and Translators in Germersheim, section of the University of Mainz). 1967 studies at Salford University, Lancashire, United Kingdom. 1969–1977 translator at the British Embassy in Bonn. 1978–1980 translator at the Embassy of Sudan in Bonn. 1990–1999 lecturer of English courses organized by the Chamber of Industry and Commerce Koblenz in

Bad Neuenahr-Ahrweiler for foreign correspondence clerks. 1993–2000 social secretary to the Minister and Ambassador at the British Embassy in Bonn and Berlin. Since January 2001 receptionist at the Europäische Akademie in Bad Neuenahr-Ahrweiler, responsible for the preparation and organisation of international conferences and meetings of the project groups.

*Arno Schatz*

(IT-Administration)

1989 final examination in foreign trade and as wholesaler at the training college Bohlscheid in Cologne, Germany. Specialized in IT. 1991 computer specialist at the German Aerospace Center (DLR): Construction, development and maintenance of the IT-data network as well as user-assistance and planning of soft- and hardware equipment, linkage of branches with the PT-network. Training of users in different programmes. Since 2001 IT-specialist at the Europäische Akademie GmbH.

Dipl.-Ing. (FH) *Jürgen Tibes* (exited 3/2001)

(IT-Administration)

1993 termination of the study of electrotechnology with the main emphasis on communication engineering and communication technology at the Fachhochschule Koblenz; 1993–1995 project engineer with the Südwestfunk Baden-Baden, transmission of digitally coded additional information via medium-wave transmitters, realisation of computerised controlling facilities for telex and very-high-frequency transmitters; 1995–1997 engineer with the Federal Ministry of Finance in Bonn, construction, servicing and maintenance for the IT Data Network and the Technical Building Equipment; 1998–2000 EDP co-ordinator at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrttechnik – DLR), since February 2000 EDP co-ordinator at the Europäische Akademie.

*Friederike Wütscher*

(Editing, Public Relations)

1991–1997 studies of English and German at the University of Köln. 1994 scholarship studies at the University of North London for 6 months.

1997–1998 work for the publishing company RAABE Fachverlag für Wissenschaftsinformation Bonn (editorial office, editing, marketing, programme). 1998–2001 press officer at the Deutsche Krankenhausgesellschaft (editing, public relations). Since March 2001 responsible for editing and public relations at the Europäische Akademie.

Heidemarie *Zimmermann*

(General Administration)

Office clerk training. 1981–1999 employment as office clerk and secretary with the Dr. Ernst Clinic, the Federal Armed Forces and the Volksbank – all located in Bad Neuenahr-Ahrweiler. 1995–1999 maternity leave. Since November 2000 member of staff at the Europäische Akademie responsible for the central administration, including personnel, the organisation of meetings of the project groups as well as the accounts of travel expenses.

### **Scientific Staff**

Dr. rer. nat. Michael *Decker* (exited 12/2002)

Studied physics (minor subject economics) at the university of Heidelberg, 1992 diploma, 1995 doctorate with a dissertation on temperature measurements in high pressure combustion by laser-induced fluorescence of molecular oxygen at the university of Heidelberg, 1995–1997 scientist at the German Aerospace Center (DLR) in Stuttgart, since February 1997 member of the scientific staff of the Europäische Akademie, project manager of the project group “Robotics. Options of the replaceability of human beings“, collaboration at the study group “Practical Philosophy” and preparation of a project on Nanotechnology Assessment.

Minou Bernadette *Friele*, M.A.

Studies of philosophy, modern history and media-science at the Heinrich-Heine-University of Düsseldorf; 12/96 Magistra Artium in Philosophy with a treatise on the notion of justice in the later philosophy of Kant;

7/98–10/99 scientific assistant at the Philosophical Institute at the University of Düsseldorf Since 10/99 scientific assistant at the Europäische Akademie within the doctoral programme; thesis on the legitimacy of the supranational law within Europe. Research associate for the “Human Genom-Project”; manager of the project “Embryo Experimentation in Europe”.

Dipl. iur. Jorge *Guerra González*

1988–93 Master’s Degree in Law and Legal Adviser for Enterprises (E-1) at the University Pontificia Comillas, ICADE, Madrid. 1994–99 Master’s Degree in Economics and Sociology at the University of Lüneburg. Since 1999 PhD at the University of Lüneburg on the subject consent to precautionary measures aiming at diminishing the transmission risks of unknown pathogens by xenotransplantations according to the German, Spanish and English Law. Since June 2002 scientific assistant at the Europäische Akademie. At present he is responsible for the preparation and co-ordination of the project “Environmental Noise”.

Dr. phil. Gerd *Hanekamp*

Studied chemistry at the universities of Heidelberg and Marburg as well as at the École Nationale Supérieure de Chimie in Lille, 1992 Dipl.-Chem., 1996 Dr.phil. with the dissertation “Protochemistry. From Substance to the Chemical Bond” in Marburg, since 1996 member of the scientific staff of the Europäische Akademie. He was manager of the project “Environmental Standards. Combined exposures and their effect on humans and their environment” and manages the project “Innovation and Sustainable Development”.

Dipl. Päd. Ulrike *Henckel*

1979 first state examination for teaching profession at Cologne. 1986 diploma in pedagogic, psychology and sociology at the University of Cologne. 1994 studies in philosophy at the FernUniversität Hagen. Since 2000 employment at the Institut für Philosophie at the FernUniversität Hagen. Beginning of dissertation on ‘Anthropological Basics of Medical Ethics’. Since 2002 she works for the Europäische Akademie and is also

responsible for the preparations for a new project of postgraduate medical education in ‘ethics of medicine’.

Dr. phil. Georg *Kamp* (exited 3/2002)

After commercial training studies of philosophy and German language and literature at the universities of Essen, Bochum and Duisburg. Magister Artium 1993, until 1998 staff member of the Institute of Philosophy at the University of Essen, in February 1999 completion of a philosophical dissertation about the possibilities and design of argumentation in regulative contexts, since April 1999 staff member of the Europäische Akademie, manager of the study group “Practical Philosophy“ and sub-editor of the journal ‘Poiesis & Praxis’.

Dr.-Ing. Christian J. *Langenbach* (exited 11/2002)

Mr. Langenbach studied aerospace technology (main field: new technologies) at the universities of Munich and Stuttgart. 1991 Bachelor of Engineering, 1997 doctoral thesis on a theoretic-analytical work about parametric comparison of space transportation systems in particular consideration of state of engineering modelling at the Technical University of Berlin, 1991 to 1996 member of research staff of Space Systems Analysis Division at the German Aerospace Center (DLR), April 1996 to October 2002 member of scientific staff of the Europäische Akademie. He managed the projects “Electronic Signatures“ and “New Materials” as well as the the study “Ethics in Space“. He was also responsible for the organization and administration of the IT-sector.

Dott. Rupert *Leitner*

Studied business administration and economics at the Università Commerciale “L. Bocconi“ in Milan with a thesis on the recycling problem of complex mass products, Dott. Leitner joined the Fachhochschule Merseburg as a lecturer. Contemporarily he studied philosophy, sociology and psychology at the FernUniversität Hagen. Before 2002 he had been working for a major international consulting firm in Hamburg. Since 2002 Dott. Rupert Leitner has joined the Europäische Akademie to work on his dissertation on the problem of ignorance of possible consequences in the

evaluation process of technology innovation options. He is member of the study group “Practical Philosophy“.

Dr. Miltos *Liakopoulos* (PhD)

Studied psychology in Greece, at Deree College, where he received a BA in 1993; did his postgraduate studies in the UK, at the London School of Economics and Political Science, where he received a MSc in Social Psychology in 1994 and a PhD in social psychology in 2000 titled “The debate on biotechnology in Britain: a social psychological analysis of arguments, images and public perceptions“; 1994, research assistant LSE (European survey on biotechnology); 1994–1995 researcher at Science Museum London, Science Communication Division (European perceptions of science and technology), 1995–1998 researcher at LSE, Department of Social Psychology (EC concerted action on biotechnology); 1998–2000 research fellow at LSE, Methodology Institute (EC concerted action on biotechnology); since 2000 member of the scientific staff of the Europäische Akademie. He manages the project “Functional Foods in Europe“.

Dr. rer. nat. *Stephan Lingner*

Studies in geology with focus on geochemistry at Würzburg University and Tübingen University; 1984 Diploma. 1990 doctorate in planetary science at Münster University, Chemistry Department. Professional activities: 1985-1990 planetary research at Münster University. 1990-1996 systems analysis at German Aerospace Center (DLR), Cologne. Since 1996 technology assessment at Europäische Akademie Neuenahr-Ahrweiler GmbH. Coordinator of the project “Klimavorhersage und Klimavorsorge“, study group “Präventiver Bodenschutz“ and the study “Reasoning Goals of Climate Protection“ on behalf of the Federal Environmental Agency of Germany (UBA). Since year 2000 associate lecturer in “Ecology“ at University of Applied Sciences, Remagen.

Drs. (NL) *Jeantine Lunshof*

Studied philosophy and orientalistics at the university of Hamburg and philosophy and health law at the University of Amsterdam, MA in 1988.

Researcher in projects at the universities of Bamberg, Heidelberg and Düsseldorf. Oncology nurse (RN) at the research clinic of the Netherlands Cancer Institute (NCI), Amsterdam. Since June 2001 member of the scientific staff of the Europäische Akademie, coordinator of the Working Group “Medical Ethics”. Research assistant at the Berlin-Brandenburgische Akademie der Wissenschaften, coordinating the interdisciplinary project “Health Standards” (spokesperson: Professor C. F. Gethmann).

Dr. rer. nat. Kathrin *Priess*

Studied Biology and Applied Oceanography in Berlin, Barcelona and Perpignan, where she graduated in 1992 (Maîtrise d’Océanologie Appliquée). 1997 doctorate degree in Marine Environmental Sciences under the auspices of both the University of Aix-Marseille II (Université de la Méditerranée) and the University Christian-Albrecht of Kiel. The Doctorate thesis was on growth variations of massive reef corals. Post-doctoral research on coral reef ecology at the Centre d’Océanologie de Marseille (1997–1998) and at the Interuniversity Institute for Marine Sciences of Eilat/Tel Aviv University (1999). 1998 Ramón y Cajal Scholar and EPTA co-ordinator in the Office for Scientific and Technology Options Assessment (STOA, DG4) at the European Parliament in Luxembourg. Since November 1999 member of the scientific staff of the Europäische Akademie, co-ordinator for the publication of the Project “Biodiversity – scientific foundations and social Relevance“ and manager of the project “Environmental standards. Dose-effect relations in the low dose range and their risk evaluation”.

Dipl. Biol. Ulrich *Rehberg* (exited 4/2002)

Studies of biology and geography at the University of Heidelberg (main field ecology and human-ecology), 1998 diploma (thesis: preservation of the countryside and nature protection), practical training at the Institute for Energy- and Environmental Research, ifeu, Heidelberg (life cycle assessment), since November 1998 scientific staff member of the Europäische Akademie as doctorand (thesis: integrated nature protection), member of the study group “Preventive soil protection”.

Dipl.-Kfm. (FH) Susanne *Stephan*

Apprenticeship in Kreissparkasse in Siegburg as bank clerk until 1998, Studies of business management at the technical university in Cologne, Dipl.-Kfm. (FH) 2002, Internships in the communication agency atw:kommunikation in Siegburg and BIA Europe (Business Incubator Association) in Malta, scientific staff in the management consultancy msc Multimedia Support Center GmbH in Bonn for two years, since January 2002 administrative Projectmanager of TAMI (Technology Assessment in Europe: between Method and Impact) in the Europäische Akademie.

## 5. Archive

### **Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien**

(Duration: 01/97–12/98)

#### Members

*Chair:* Professor Dr.-Ing. Helmuth Harig, Faserinstitut Bremen e.V. und Fachbereich Produktionstechnik -Werkstofftechnik- der Universität Bremen

- Priv.-Doz. Dr. rer. nat. Armin Grunwald, Europäische Akademie Bad Neuenahr-Ahrweiler GmbH
- Professor Dr.-Ing. Heinrich Hofmann, Pulvertechnologisches Labor der Eidgenössische Technische Hochschule Lausanne (EPFL)
- Professor Dr. rer. nat. Wolfgang A. Kaysser, Institut für Werkstoff-Forschung des Deutschen Zentrums für Luft- und Raumfahrt e.V. (DLR) Köln und RWTH Aachen
- Professor Dr.-Ing. Rainer Renz, Lehrstuhl für Recyclinggerechte Produktgestaltung/Entfertigung der Universität Kaiserslautern

- Professor Dr. rer. nat. Günther Schmid, Institut für Anorganische Chemie der Universität-Gesamthochschule Essen

*Project Coordinator:* Dr.-Ing. Christian J. Langenbach, Europäische Akademie Bad Neuenahr-Ahrweiler GmbH

### Final Report

Harig H, Langenbach C J (eds) (2000) *Neue Materialien für innovative Produkte: Entwicklungstrends und gesellschaftliche Relevanz*. Springer, Berlin Heidelberg (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 3)

### Publications

Harig H et al. (1997) “Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien. Perspektiven in der Verkehrstechnik”, Endbericht zum Vorprojekt, “Graue Reihe” no. 4, Europäische Akademie GmbH (ed) Bad Neuenahr-Ahrweiler

Harig H, Langenbach C J (1999) “Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien”, Memorandum, Springer, Berlin Heidelberg New York

Langenbach C J (1997) “Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien”. In: Informationen zur TA, DLR, VDI, VDI/VDE (eds), 10/1997, pp 9–10

Langenbach C J (1998) “Langfristige Perspektiven in der Materialwissenschaft – Ein Fall für die Technikfolgenbeurteilung?”. In: TA-Datenbank-Nachrichten, Nr. 1, 7. Jahrgang, pp 69–71

Socher M (November 1997) “Neue Werkstoffe – ein interessantes Thema für die Technikfolgenforschung”, Rezension. In: TA-Datenbank-Nachrichten, Nr. 3/4, 6. Jahrgang, pp 87–89

For details please see: Forschungsbericht 1999–2000

## **Umweltstandards. Kombinierte Expositionen und ihre Auswirkungen auf die Umwelt und den Menschen**

(Duration: 1/97–12/98)

### Members

*Chair:* Professor Dr. rer. nat. Dr. med. h. c. Christian Streffer, Universität Essen

- Professor Dr. rer. pol. Dieter Cansier, Universität Tübingen
- Professor Dr. phil. Carl Friedrich Gethmann, Europäische Akademie Bad Neuenahr-Ahrweiler GmbH
- Professor Dr. rer. nat. Robert Guderian, Universität Essen
- Professor Dr. med. Dietrich Henschler, Universität Würzburg
- Professor Dr. med. Gerald Pöch, Universität Graz
- Professor Dr. jur. Eckard Rehbinder, Universität Frankfurt a. M.
- Professor Dr. rer. pol. Ortwin Renn, Akademie für Technikfolgenabschätzung in Baden-Württemberg

### *Project Coordinator:*

Dr. rer. nat. Stephan Saupe (until 9/98),

Dr. phil. Gerd Hanekamp (from 10/98)

Europäische Akademie Bad Neuenahr-Ahrweiler

### Final Report

Streffer C, Bücken J, Cansier A, Cansier D, Gethmann C F, Guderian R, Hanekamp G, Henschler D, Pöch G, Rehbinder E, Renn O, Slesina M, Wuttke K (2000) *Umweltstandards. Kombinierte Expositionen und ihre Auswirkungen auf den Menschen und seine Umwelt*. Springer, Berlin Heidelberg (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 5)

### Publications

Saupe S (1997) “Projekt Umweltstandards: Kombinierte Expositionen und ihre Auswirkungen auf die Umwelt und den Menschen”, TA-Datenbank-Nachrichten, 6. Jg., Nr. 3/4, pp 69–72

Saupe S (1998) “Environmental Standards for Combined Exposures? Ethical and Legal Aspects”, Preprints der Jahrestagung der Societas Ethica, Turku, Finnland, p 100

For details please see: Forschungsbericht 1999–2000

### **Xenotransplantation of Cells, Tissues or Organs.**

#### **Scientific Developments, Ethical Implications and Social Relevance.**

(Duration: 04/98–03/00)

### Members

*Chair:* Professor Dr. phil. Jan P. Beckmann, Institut für Philosophie, FernUniversität Hagen

- Professor Dr. med. vet. Dr. med. vet. habil. Dr. h.c. Gottfried Brem, Institut für Tierzucht und Genetik, Veterinärmedizinische Universität Wien
- Professor em. Dr. med. Friedrich W. Eigler, Abteilung für allgemeine Chirurgie, Universitätsklinik Essen
- Professor Dr. rer. nat. Dr. habil. Walter H. Günzburg, Institut für Virologie, Veterinärmedizinische Universität Wien
- Professor Dr. med. Dr. med. vet. Claus Hammer, Institut für Chirurgische Forschung, Klinikum Großhadern
- Professor Dr. med. Dr. med. dent. Dr. h. c. Wolfgang Müller-Ruchholtz, Institut für Immunologie, Klinikum der Universität Kiel
- Professor Dr. jur. Dr. h.c. Hans Ludwig Schreiber, Juristisches Seminar der Universität Göttingen

*Project Coordinator:* Dr. rer. nat. Eva M. Neumann-Held, Europäische Akademie Bad Neuenahr-Ahrweiler

### Final report

Beckmann J P, Brem G, Eigler F W, Günzburg W, Hammer C, Müller-Ruchholz W, Neumann-Held E M, Schreiber H-L (2000) *Xenotransplantation von Zellen, Geweben oder Organen. Wissenschaftliche Entwicklungen und ethisch-rechtliche Implikationen*. Springer, Berlin (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 8)

### Publications

Beckmann Jan P (1997) Xenotransplantation. Ethische Fragen und Probleme. “Graue Reihe” no. 7. Europäische Akademie, Bad-Neuenahr-Ahrweiler

Neumann-Held Eva M (1998) Xenotransplantation von Zellen, Geweben oder Organen. Wissenschaftliche Entwicklungen, ethische Implikationen und gesellschaftliche Relevanz. TA Datenbank Nachrichten

Beckmann J P, Brem G, Eigler F W, Günzburg W, Hammer C, Müller-Ruchholtz W, Neumann-Held E M, Schreiber H L (2000) *Xenotransplantation von Zellen, Geweben oder Organen. Wissenschaftliche Entwicklungen und ethisch-rechtliche Implikationen*. Springer, Berlin

For details please see: Forschungsbericht 1999–2000

### **Ethical Questions and Societal Consequences of Human Genetics**

(Duration: 4/98–3/00)

#### *Members*

Chair: Professor Dr. med. Claus R. Bartram,  
Institut für Humangenetik, Universität Heidelberg

– Professor Dr. phil. Jan P. Beckmann, Institut für Philosophie,  
FernUniversität Hagen

- Professor Dr. rer. pol. Friedrich Breyer, Fakultät für Wirtschaftswissenschaften, Universität Konstanz
- Professor Dr. rer. nat. Georg Fey, Lehrstuhl für Genetik, Universität Erlangen
- Professor Dr. phil. Christa Fonatsch, Institut für medizinische Biologie, Universität Wien
- Professor Dr. phil. Dr. theol. Bernhard Irrgang, Zentrum für Interdisziplinäre Technikforschung, Universität Dresden
- Professor Dr. jur. Jochen Taupitz, Lehrstuhl für Bürgerliches Recht, Zivilprozeßrecht, Internationales Privatrecht und Rechtsvergleichung, Universität Mannheim

*Projekt Coordinator:* Dr. med. Felix Thiele, M.Sc., Europäische Akademie Bad Neuenahr-Ahrweiler

### Final Report

Bartram C R, Beckmann J P, Breyer F, Fey G, Fonatsch C, Irrgang B, Taupitz J, Seel K-M, Thiele F (2000) *Humangenetische Diagnostik. Wissenschaftliche Grundlagen und gesellschaftliche Konsequenzen*. Springer, Berlin (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 7)

### *Publications*

Thiele F (1999) Ethische Fragen und gesellschaftliche Folgen der Humangenetik. TA-Datenbank-Nachrichten, no. 1, 8.Jg.,

Thiele F (ed) (2000) Genetische Diagnostik und Versicherungsschutz. Die Situation in Deutschland. “Graue Reihe” no. 20, Europäische Akademie, Bad Neuenahr-Ahrweiler

For details please see: Forschungsbericht 1999–2000

## **Biodiversität. Wissenschaftliche Grundlagen und gesellschaftliche Relevanz**

(Duration: 10/97–10/99)

### *Members*

Chair: Professor Dr. phil. Peter Janich,

Institut für Philosophie, Philipps-Universität Marburg,

- Priv.-Doz. Dr. rer. nat. Rudolf Amann, Max-Planck-Institut für marine Mikrobiologie Bremen
- Dr. phil. nat. Klaus Ammann, Botanischer Garten, Bern
- Professor Dr. rer. nat. Heinz Saedler, Max-Planck-Institut für Züchtungsforschung Köln
- Professor Dr. rer. nat. Fritz F. Steininger, Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a. M.
- Dr. rer. nat. Michael Türkay, Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a. M.
- Professor Dr. jur. Rüdiger Wolfrum, Max-Planck-Institut für ausländisches und öffentliches Recht, Heidelberg

### *Project Coordinator:*

Dr. phil. Dr. phil. nat. Mathias Gutmann (until 10/99),

Dr. rer. nat. Kathrin Prieß (from 11/99)

Europäische Akademie Bad Neuenahr-Ahrweiler

### Final Report:

Janich P, Gutmann M, Prieß K (eds) (2001) *Biodiversität. Wissenschaftliche Grundlagen und gesellschaftliche Relevanz*. Springer, Berlin (series “Wissenschaftsethik und Technikfolgenbeurteilung” vol. 10)

*Publications*

Amann R, Rossello-Mora R (2000) The Species Concept in Prokaryotic Taxonomy, “*Graue Reihe*” no. 22, Europäische Akademie Bad Neuenahr-Ahrweiler

Barthlott Wilhelm u. Gutmann Mathias (eds) (1998) Biodiversitätsforschung in Deutschland: Potentiale und Perspektiven, “*Graue Reihe*” no. 11, Europäische Akademie Bad Neuenahr-Ahrweiler

Galert Thorsten (1998) Biodiversität als Problem der Naturethik. Literaturreview und Bibliographie, “*Graue Reihe*” no. 12, Europäische Akademie Bad Neuenahr-Ahrweiler

Gutmann Mathias, Janich, Peter (1997) Zur Wissenschaftstheorie der Genetik. Materialien zum Genbegriff, “*Graue Reihe*” Nr. 5, Europäische Akademie Bad Neuenahr-Ahrweiler

*Studies*

Literaturreview und Bibliographie zum Thema: Die Bewahrung der Biodiversität als Problem der Naturethik. Durchgeführt vom 30.09.1997 bis 28.02.1998 von Thorsten Galert bei Professor Dr. Peter Janich

Literaturreview und Bibliographie zum Thema “Artbegriff in der Paläontologie”. Durchgeführt vom 01.07.1998 bis 31.12.1998 von Herrn M. Gudo bei Professor Dr. Fritz F. Steininger

Priv.-Doz. Dr. Rudolf Amann: Der Artbegriff in der Mikrobiologie. Vergangenheit, Gegenwart, Zukunft

Dr. Michael Türkay: Studie über Qualifizierungsmöglichkeiten der Biodiversität an einem gegebenen Ort bei Anwendung taxonomischer und systematischer Methoden im Rahmen des Projekts “Biodiversität” der Europäischen Akademie

For details please see: Forschungsbericht 1999–2000

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