



# Europäische Akademie

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

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

## RESEARCH REPORT

2003 – 2004



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## Foreword

This is the fourth research report issued by the Europäische Akademie and it covers the research period from 2003 to 2004. We are thus complying with our commitment to provide a bi-annual research report, as mentioned in the foreword of the research report for 1996–1998. As there has been little change in the structure of the research activities since, the format and order of the report can essentially be maintained. The projects, which have been presented in previous research reports, are included in short form, permitting a general overview of the activities of the Europäische Akademie.

The main emphasis of the following report is on the projects of the fourth generation, which are due to be completed in 2005 and 2006. Since these projects are at a highly advanced stage at the time of the creation of this report, we can only reconfirm what has already been established in the foreword of the previous report. Based on the experience gained during 18 interdisciplinary projects that have been carried out (including those which are currently running) the instrument of the interdisciplinary project group may be regarded as having proved itself as a mode of operation.

The report documents the interdisciplinary and international orientation that is central to the research activities undertaken by the Europäische Akademie. Our scientific work is rendered fully transparent and accessible to the scientific communities and the public, above all by the spring and autumn conferences, numerous expert meetings as well as the four institutionalised publications (book series "Wissenschaftsethik und Technikfolgenbeurteilung" with 25 volumes, the series "Graue Reihe", the scientific journal "POIESIS & PRAXIS", the third volume of which will be completed in the beginning of 2005, and the Newsletter).

The results that are shown here could only be achieved because of the time and energy many scientists were prepared to give to the project and to the study groups. The Council of the Europäische Akademie meanwhile comprises 120 scientists. Together with permanent scientific staff, they form the "intellectual capital" of the academy.

The Sponsors Club (*Förderer der Europäischen Akademie Bad Neuenahr-Ahrweiler e.V.*) has now taken over the running of the Europäische Akademie's regional activities as well as the working group on Medical Ethics and the art exhibitions. The "Ahrtalgespräche" which are jointly run by the Sponsors Club and the City of Bad Neuenahr-Ahrweiler are helping to further strengthen the Europäische Akademie's firm position in the region.

Our grateful thanks are due to our partners, the Bundesland Rhineland Palatinate (*Land Rheinland-Pfalz*) and the German Aerospace Centre (*Deutsches Zentrum für Luft- und Raumfahrt e.V.*) for their continued

## II. Results of Research

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support. The sponsorship provided by the Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung*) has been invaluable for the scientific work that we report on here.

However, the 10-year sponsorship agreement with the *Federal Ministry of Education and Research* runs out at the end of 2005. Our partners and the *Federal Ministry of Education and Research* are currently conducting talks with view to the continuation sponsorship at federal level. This report shall demonstrate that the Europäische Akademie has fulfilled its task to perform interdisciplinary research on questions of current interest to society. There is no lack of themes: their number grows faster than it is possible to run projects. The incredible pace of progress in many areas of science means that issues that have been dealt with previously must be dealt with again. The dialogue between science and society is more important than ever and it is now virtually undisputed that scientists, among other actors, have a real job to do. The work of the Europäische Akademie enables the disciplines of science to fulfil their task to provide society with scientific advice. In this way, science is not the object but the subject of research.

Bad Neuenahr-Ahrweiler, January 2005

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 other 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-Palatinat (*Land Rheinland-Pfalz*) and the German Aerospace Center (*Deutsches Zentrum für Luft- und Raumfahrt e.V.*). Managing director of

the company as well as director of the academy is Professor Dr. phil. Dr. phil. h.c. Carl Friedrich Gethmann, who is a full professor of applied philosophy at the Universität Duisburg-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* 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, three doctoral candidates were employed at the Europäische Akademie (cf. section IV, 6.2) as well as two 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 ten 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: "TAMI Technology Assessment in Europe: between Method and Impact", "Embryo Research in Pluralistic Europe", "Functional Foods" and "Environmental Standards. Low Dose Effect Relations and their Risk Evaluation" (cf. section II, 1).

The Newsletter (*Akademie-Brief*), as the regular news organ of the Europäische Akademie, has meanwhile been published in its 51<sup>st</sup> 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 37th 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 – 25 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 number of projects that dealt with problems stemming from areas as diverse as climate change, robotics, and research in the modern life-sciences. 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 few years, English has become the working language in the majority of projects run by the Europäische Akademie. 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 12 European countries. In addition, staff members of the academy come from 5 European countries. Furthermore, the Europäische Akademie became a member of several European networks and associations, so that its abilities for supranational cooperation have been improved further. This internationalisation of the Europäische Akademie is expected to continue in the years to come.

### **4. 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:

1. in the methodology field will be:

- 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.

## I. Scientific Concept

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- 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.

## **II. Results of Research**

### **1. Project Groups**

#### **1.1 TAMI Technology Assessment in Europe: between Method and Impact (completed)**

##### *1.1.1 Background and Tasks*

Technology Assessment (TA) in Europe has evolved significantly in recent years by experimenting on 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 Science and Technology (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 are intertwined in the public area. Part of this debate refers to scientific advice in policy-making and ways in which this relationship can improve and become more comprehensive.

TAMI aspired to provide some concrete contributions to this debate and involved a group of leading TA experts from major European TA-institutes to discuss these issues. Such dialogue should provide the opportunity to exchange information and knowledge gathered through many years of European TA.

The main objective of TAMI was to create and promote a structured dialogue within the TA community as well as between TA experts and policy makers with the aim of improving the effect of TA in S&T policy.

In detail, the objectives of the project were to:

- Review and evaluate the state-of-the-art of methods and practices used in current European TA.
- Review and evaluate impact assessment studies that have already been undertaken by European TA Institutes.
- Compare major European S&T policy structures and parameters affecting them.
- Identify "best practices" in TA that maximise impact relative to policy needs.
- Use Examples.
- Create a common reference system for the Method, Impact and Policy components of TA.

### 1.1.2 Results

TAMI aimed at creating a structured dialogue between Technology Assessment experts and decision-makers in the area of Science and Technology concerning the methods used and the impact of current TA activities. Two teams, one focusing on method and the other on impact, have been working together to provide answers to the main issues preoccupying European TA nowadays. Following, is a summary of the results of both groups.

#### a) Method Group

The method group paper on "The Practice of TA. Science, Interaction, and Communication" elaborated the following results:

##### The Definition of Technology Assessment

One aim of the TAMI project was to stimulate discussion between the actors in all kinds of Technology Assessment. This involved institutions directly connected with parliaments, as well as university institutions dealing with TA and independent academic institutions. Some of these institutions focus on concrete TA-paradigms, such as "expert TA" or "participatory TA"; others do not restrict themselves in such a way. The different concepts of TA made it necessary to define - in an acceptable way for all participants - what the TAMI consortium meant when using the term "Technology Assessment":

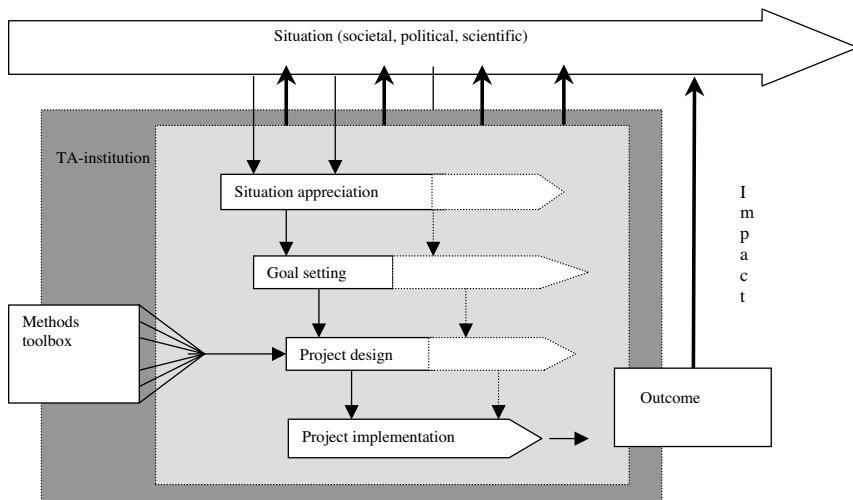
*Technology assessment is a scientific, interactive and communicative process which aims to contribute to the formation of public and political opinion on societal aspects of science and technology.*

##### From Method to Impact: A complex relationship

TAMI not only needed a common definition on Technology Assessment, but also had to base its discussions on a common framework in order to understand the relationships between method and impacts. The following structure was developed in reverse, starting with the fact that impact can only be achieved by concrete TA-projects, which implement or realise a project design.

The design depends firstly on an appreciation of the current situation, which is a necessary step to set realistic and correct goals. Based on this appreciation of the situation and the goals set, adequate methods for the project design will be chosen from a "methods toolbox". At this stage, one has to justify that the method(s) chosen have the greatest potential to reach the set goals. Moreover, more general criteria concerning good practice in TA must be taken into account. They are, according to our definition and like the methods in the toolbox, clustered in scientific (1), interactive (2) and communication (3) quality criteria, referring for example to (1) scientific reliability in interdisciplinary contexts, (2) social fair-

ness and transparency of the process and (3) flexibility and keeping track of the public debate, dissemination of the results and striving for synergies. Finally, the project design should contain procedures caring the TA-practitioners to keep track of the social and scientific situation while implementing the project. In the following sections the crucial steps of the TA-structure are explained in more detail.



The *situation appreciation* refers to a variety of aspects, such as the issue dimension (an issue can be technology-, domain-, or consequence-oriented), the political dimension (ranging from issues which have not yet been officially addressed by the government, to those that are in a political deadlock), the social dimension (taking into account the value dimension, the relation to the public, possible technology conflicts and social roles and relationships), the innovation dimension (research and development in the early stages, industrial research, the marketplace, widespread diffusion, embedded technological systems) and finally the general aspect of availability of knowledge.

The *goal setting* includes the whole range of goals (cf. the description of roles in the impact group paper), from gaining knowledge about a technology and its consequences, through rising awareness, accompanying the technological development process, fostering common thinking, resolving a political deadlock, fostering a common dialogue between experts and the public, to informing or integrating the public.

As mentioned above, the development of the *project design* refers to both the greatest potential to reach the goals and the general quality criteria

of “good practice” in TA. The method toolbox, as well as the general quality criteria, have been structured according to the scientific, interaction and communication claims of TA. Finally the *implementation* of the project-design takes place by realizing the identified methods in the planned way. This is where discrepancies between (ideal case) methods and their transfer to the real world might appear.

The *institutional setting* influences, of course, the whole process. Different types of TA-institution (e.g. parliamentary TA-institution, scientific institution, etc.) have to be considered, along with different audiences or target groups and different types of expertise on issues and methods.

### Recommendations

The paper developed a common framework to gain an insight into the complex relationship between method and impact. Elaborating on this framework the following recommendations can be made:

- Set proper and realistic project goals and choose the appropriate (mix of) methods based on a sound and detailed situation appreciation.
- Be aware that there is no unique answer to a situation appreciation; in other words, the same issue can be addressed in different ways. For example, depending on its institutional context, one institute might address the lack of knowledge about an issue, whereas the other might focus on stimulating public debate.
- A TA institution should be aware of its method of tackling issues and that this is known and accepted by outside players (e.g. decision-makers). Only under these conditions will it be possible to set the right goals and to define an appropriate project, with the chance to reach a certain audience – and thus achieve a certain impact.
- Gaining any type of impact is not an end in itself. Instead of solving a problem, a TA project could create new problems. In other words, negative impacts may occur. It is important to be conscious of the appropriate type of impacts one wants to strive for.
- Be aware of the fact that no simple linear relation exists between the method mix used and the impact reached. The impact of TA projects also depends on both internal factors (like project management competencies, budget constraints, organisation culture, and institutional arrangements) as well as (mostly uncontrollable) external influencing factors (such as strategies of other actors, timing of the policy-making process, sudden changes in the problem situation). Accordingly, a proper choice of methods does not guarantee reaching the set goals.
- TA projects should keep pace with social, political and scientific reality. Situation appreciation must, therefore, be an ongoing feature of project management.

- Allow for sufficient flexibility in the project design and the procedures of the TA institution to adapt to relevant changes – like new scientific discoveries, an increasing (and often sudden and short) media attention, a political intervention, etc. – that may (and most likely will) occur during the duration of the project.
- TA projects have to reach scientific, interactive and communication quality criteria in order to attain legitimate short-term impact and to build up and maintain institutional trust in the long term.
- There might be possible ambiguities or trade-offs between short-range impact and the building of long-term trust and credibility. Creating impact by using invalid or deficient knowledge is, for example, no problem for mass media. They are aiming at creating short-term impact and awareness. TA, however, would endanger its long-term credibility in such a case. One should, therefore, distinguish between impacts on different time scales.
- Communication has to be considered as the key way to achieve impact. Fulfilling scientific and interactive criteria is a necessary, but not sufficient, condition for achieving an impact.
- Communication goes beyond communicating about the results of a project. Selecting a certain topic for the agenda of a TA institute already sends a message to the outside world.
- Doing TA and assessing societal issues related to science and technology is the core business of TA institutes. This TA identity should be strengthened by developing communication competencies in-house (but TA institutions should not become communication bureaus). Synergies with organisations (such as science museums, debating centres, and media) have to be encouraged, particularly with organisations that specialize in getting messages across.

### b) Impact Group

The impact group paper "Towards a Framework for Assessing the Impact of Technology Assessment" elaborated the following results:

The work of the Impact group in TAMI revolved primarily around the issue of the meaning of the term and its deconstruction into identifiable goals. There is very little available information on attempts to measure the impact of Technology Assessment in Europe. This reflects the general lack of coordinated action in discussing the goals of TA and the processes by which they can be attained. The knowledge vacuum in this area has consequences for the ability of TA as a discipline to communicate its roles and consequently, its impact on society. Against this background the TAMI Impact group has worked out a comprehensive review of TA's impact, a short summary of which follows below.

### Definition of Impact

The term "impact" refers to the expectation which, on a general level, is held by both TA-practitioners and clients (usually policy makers) as well as observers of policy consulting: TA has to *make a difference* in terms of the quality of decision making processes by adding comprehensive and non-biased knowledge to this process. The implicit expectation is that decision making *with* TA leads to "better" (more rational, informed or legitimate) decisions than would have otherwise been achieved *without* TA. This, however, is based on an ideal concept of rational decision making (which to some extent ignores the reality of politics) and the impact of TA in this sense is hardly measurable. Nevertheless, this concept is behind all discussions on impact since it is indeed connected with the traditional mission of TA.

For the purposes of the TAMI project, which is dedicated to furthering the discussion between TA practitioners and clients on the relationship between methods applied and impacts achieved, it was decided to use the term "impact" in a more general sense; not relating it solely to the specific mission of TA as "improving decision making in terms of rationality or legitimacy", but instead applying a broader concept that describes the overall effect of TA in policy making and public debates.

*"Impact of Technology Assessment is defined as any change with regard to the state of knowledge, opinions held or actions taken by relevant actors in the process of societal debate on technological issues."*

These effects might range from "raising awareness" for a particular issue/problem to "changing legislation". This concept of impact has been clarified by working out a typology which is made up of three dimensions of impact which can be related to three dimensions of the issue that TA is dealing with.

### Typology of Impacts

One could roughly discern three dimensions of impact that TA or policy consulting in general could have: impact in the dimension of **knowledge** used in policy making or public debate, impact in the sense of **forming opinions/attitudes** of actors involved in the debate, and impact in the sense of **initialising actions** taken by policy makers or other actors.

Table: Typology of Impacts

IMPACT DIMENSION ISSUE DIMENSION	I. RAISING KNOWLEDGE	II. FORMING ATTITUDES /OPINIONS	III. INITIALISING ACTIONS
<b>TECHNOLOGICAL /SCIENTIFIC ASPECTS</b>	<b>SCIENTIFIC ASSESSMENT</b> a) Technical options assessed and made visible b) Comprehensive overview of consequences given	<b>AGENDA SETTING</b> f) Setting the agenda in the political debate g) Stimulating public debate h) Introducing visions or scenarios	<b>REFRAMING OF DEBATE</b> o) New action plan or initiative to further scrutinise the problem decided p) New orientation in policies established
<b>SOCIETAL ASPECTS</b>	<b>SOCIAL MAPPING</b> c) Structure of conflicts made transparent	<b>MEDIATION</b> i) Self-reflecting among actors j) Blockade running k) Bridge building	<b>NEW DECISION MAKING PROCESSES</b> q) New ways of governance introduced r) Initiative to intensify public debate taken
<b>POLICY ASPECTS</b>	<b>POLICY ANALYSIS</b> d) Policy objectives explored e) Existing policies assessed	<b>RE-STRUCTURING THE POLICY DEBATE</b> l) Comprehensiveness of policies increased m) Policies evaluated through debate n) Democratic legitimation perceived	<b>DECISION TAKEN</b> s) Policy alternatives filtered t) Innovations implemented u) New legislation is passed

These dimensions of impact can be related to three dimensions of the issue that TA-projects usually deal with and that TA is expected to generate knowledge about. TA has to deliver (as comprehensive and unbiased as possible) information on the **technological and scientific aspects** of the issue that is at stake (e.g. features of technology, results/or problems of scientific risk assessment, economic costs, eco-balances etc.).

A description of the problem/issue at stake would be incomprehensible without describing the **societal aspects**: TA has to deliver knowledge about relevant actors (their interests, values etc.) and possible social conflicts that can evolve around the technology under consideration.

On the basis of a proper description of the scientific and technological aspects, in connection with a description of the social environment (debate, actors), TA has to analyse the **policy aspects** of the problem, meaning it has to consider the restrictions and opportunities of policy making and has to develop policy options, i.e. explore politically viable ways for problem solving (e.g. legislation, R&D funding, action plans) and again evaluate options with regard to possible side-effects (e.g. social conflicts) they might have.

Using these dimensions of impact and dimensions of the issue we gain a matrix that shows nine types of impact of Technology Assessment. An inventory of 23 roles or functions of TA that was developed by the members of TAMI-project can be categorised according to these types of impact.

### Raising Knowledge

The three types of impact in the column "raising knowledge" are perhaps most directly related to the deliverables of TA. The outcome of a TA-process (e.g. a report) as well as the process itself (participatory procedures, workshops etc.) may make policy makers or other relevant actors aware of formerly unknown scientific knowledge on risks, chances, unintended consequences etc. (**scientific assessment**), of interests or perspectives of actors involved (**social mapping**) or of problems or options for policy making (**policy analysis**).

### Forming Attitudes/Opinions

Raising knowledge (by output or process) is a precondition for initiating learning that might aid the formation of opinions and attitudes amongst actors. Changes in attitude may occur with regard to new scientific aspects that are discussed among policy makers or in public debates (**agenda setting**). The TA-process or outcome might also change the way relevant actors see or deal with each other (**mediation**), or options for policy making might be seen/discussed in a different way, e.g. new options becoming prominent on the agenda of policy making (**restructuring the policy debate**).

### Initialising Action

Impact in the dimension of "initialising action" means that a TA process influences directly the outcome of the policy making process. Regarding the scientific aspects of the issue at stake, a TA-process may lead to **reframing of the debate**, e.g. initiatives to further scrutinise aspects of the problem. With regard to the societal aspects (actors, conflicts) policy makers may decide to initialise **new ways of decision making**, e.g. to set up a programme to intensify public discourse or to include social groups in the decision-making process. Apart from such initiatives, which can be seen as new ways of dealing with the problem, it might also be that TA leads to a definite **decision** about new policies (in the sense of closure of the debate): e.g. to implement a technology, or to set up legal rules for implementation.

The three dimensions given above might also be read as an "effect-continuum" starting from "raising knowledge" and leading to "forming attitudes/opinions" and, eventually, to "initialising action/initiative". In the first dimension one could speak of a low level of effect (i.e. a client notices the results of a TA process) which may imply a "fuller understand-

ing of the problem" or "a broader view of aspects related to the problem" without directly inducing a change in attitude or behaviour. This is the necessary first step to a more explicit effect in the dimension of "attitude" and "action": the application of new knowledge stemming from TA studies becomes visible, knowledge is observably applied as argument in the debate and this might have direct impact on decision making in the sense of changing its path and/or bringing up new political initiatives. The latter two steps obviously imply not only awareness but also *application* of knowledge in a narrower sense and therefore presume an active adoption of knowledge where it has to be integrated into the "belief system" of actors. The application of knowledge in political action is naturally also highly dependent on constraints and opportunities given by the actual policy context (e.g. need for compromises in policy networks, respect for existing policy coalitions, compatibility with existing policy programmes etc.).

### Limits of TA's Impact due to other Influencing Factors

Influencing factors on the impact of TA, other than the chosen methodology, denote limits in the conception and execution of the TA process and at the same time present formidable challenges in the final reception of the TA study. The TAMI group has identified three main categories of influencing factors: Institutional Setting, Technology Policymaking Culture, and Structure and State of the Innovation Process.

The particular organisational structure of the TA institute naturally poses certain limitations on the type of work it can undertake and the manner in which this can be done. The overall mission of the organisation and the main target groups for its work constitute the first such limitation (e.g. parliamentary vs non-parliamentary TA); further limitations can be identified as the official relationship between the institute and its "clients", and institutional image and overall state of competition.

Moreover, the opportunities to produce impact are largely dependent on the role of organised interests (scientists, NGOs, business) in policy making. Domination of decision making by a particular group or a coalition of groups restricts the openness for adoption of knowledge and, consequently, the role TA can play. The state of public awareness and public involvement in technology policy might nevertheless present a counterbalance to organised interests and enhance the role of TA.

Finally, the way that the overall innovation system functions presents another factor affecting the impact of TA. In state driven innovation systems the prime driving force behind the adoption of new technologies are public forum. In this case, TA can have more direct influence in policy making and the shaping of technology since it is an accredited public service, free of interests and agendas. In market driven innovation systems, there is no legitimisation for state intervention in technology development on the basis of societal "needs". Therefore, opportunities for TA to

affect the process of technology policy and development are restricted. Additionally, the trajectory of the innovation process is important: the earlier TA enters the innovation trajectory, the more possibilities there are to shape the future of the technology at stake but at the same time the more partial and vague the available information is; the later TA enters the trajectory, the more complete and comprehensive the knowledge over the technology is, but at the same time the less chance there is to influence the innovation strategy.

### Conclusions

The typology and the set of roles developed in the TAMI project show that, when thinking about the impact of TA, there is more to be considered than the direct influence of TA on political decision making (i.e. the lower right box of the typology). TA – whether “classical” or „participatory” – contributes to social debate and policy making in many ways: by supplying unbiased knowledge, by supporting communication processes, by offering new perspectives on a problem at stake or by opening up new opportunities to restart the debate in deadlock situations etc. The tableau of roles provided by the typology can support self-analysis in the design of a TA project since it provides a structure for clarifying the goals a project may set in a given situation and in relation to the institutional setting, the specific political and cultural features, the state of the public debate and the trajectory of the innovation process.

Given the complexity of the issues and the political environment TA normally deals with, it cannot be expected that an ideal method exists to achieve a certain type of impact. It is nevertheless true that “classical” TA relates more to the first column of the typology while “participatory TA” relates to the second, and this should be taken into account when attempting impact evaluation. The increasing demand in recent years for participatory methods should be regarded as a reaction of TA to a changing social and political environment: the growing demands of civil society to be involved in policy making and the increased need to cope with social dissent and conflicts about emerging technologies.

Within this new climate, TA expands its scope towards direct involvement in the process of opinion forming by acting as a “communication node” without inducing a particular opinion or perspective. However self-evident this may be, it is important to stress that whereas TA has methods to raise knowledge as well as to organise, stimulate and moderate debates and communication processes, having a direct impact on decision making is beyond the reach of TA’s “method toolbox”. TA should be seen as a necessary link in the process of decision making and not as a substitute to it.

### 1.1.3 Publication

Final report:

M. Decker, M. Ladikas (eds)(2004): *Brigdes between Science, Society and Policy. Technology Assessment – Methods and Impacts*. Springer-Verlag, Berlin, ISBN 3-540-21283-3 (book series: *Wissenschaftsethik und Technikfolgenbeurteilung*, vol. 22)

### 1.1.4 TAMI Members

TAMI was co-ordinated by the Europäische Akademie in Germany. The following institutions have participated in the TAMI project:

- *The Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen Bad Neuenahr-Ahrweiler GmbH* (EA), Germany
- *The Parliamentary Office of Science and Technology* (POST), UK
- *The Forschungszentrum Karlsruhe GmbH (FZK), Institute for Technology Assessment and System Analysis* (ITAS), Germany
- *The Academy for Technology Assessment in Baden Württemberg* (CTA), Germany
- *The Danish Board of Technology* (DBT)
- *The Centre for Science and Technology Studies* (TA-SWISS), Switzerland
- *The Centre of Science, Technology and Society Studies at the Institute of Philosophy of the Academy of Sciences* (STSS Centre), Czech Republic
- *The Warsaw School of Economics* (SGH), *Institute of Modern Civilisation* (IPWC), Poland
- *The Consejo Superior de Investigaciones Cientificas* (CSIC), *SPRITE* (Spanish Policy Research on Innovation & Technology, Training and Education), Spain

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

- *The Committee on Industry, External Trade, Research and Energy, European Parliament*, Belgium
- *The Rathenau Institute*, The Netherlands
- *The Flemish Institute for Science and Technology Assessment* (viWTA), Belgium

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Duration: 1/02 – 12/03

### 1.2 Functional Foods (completed)

#### 1.2.1 *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 discerned 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 real epidemic proportions. A daily diet overburdened 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 is spreading not only among the majority of the adult population but also, more worryingly, among the younger generations, who rarely have the option of alternative diets. Moreover, as scientific proof for the link between diet and disease (particular cardiovascular diseases and some cancers) mounts up, there is an increasing number of calls for action. This is the situation in which 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 would appear necessary to assess and evaluate the developments in food production in terms of their effect on the individual consumer and society as a whole.

Moreover, Functional Foods are being 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 on 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 of food production: the modification of the physical structure and the chemical composition of food products in order to achieve particular effects on body functions. In many cases, these modifications 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 on the market. In line with these issues the socio-political implications of Functional Foods 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 analysed the consequences of the emergence of functional foods on: 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.).

### *1.2.2 Work Programme*

The main work of the project consisted of elaborating scientific findings through interdisciplinary discussions within the project team and in regular 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, when the project team was constituted, followed by two additional meetings at which the project work was worked out in detail. The participants offered a critical evaluation of the state-of-the-art in their particular disciplines 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*

University of Central Lancashire, UK

*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 have been finalised into common text according to the principle of consensus. That includes specific recommendations, targeting policy making institutes at the international level. The finalised text was then presented to the Scientific Advisory Board of the Europäische Akademie for approval before entering publication and dissemination processes.

### *1.2.3 Results/Publications*

#### Consumer Sovereignty

The group assumes that governmental interventions in the food market should not be realized through prohibitions or restrictions, but rather by constructive measures – e.g. financial support for the development of healthy food, the improvement of the availability of such foods and especially labelling of products and further information of the general public.

#### Health Claims Regulation and Scientific Assessment

In contrast to nutrition claims, health claims for foods are currently not allowed under European law. In contrast, the project group argues in favour of health claims. In addition the group argues that the European Food Safety Authority should be the EU body responsible for assessing the safety and particularly the efficacy of Functional Foods.

#### Post Launch Monitoring

The group believes that a system which could be called “Post Launch Monitoring” (PLM) would be the best approach both to collect informa-

tion on benefits and to prevent larger scale problems due to unexpected or unforeseen adverse reactions, inappropriate use or use by consumers other than those belonging to the expected target-group.

### Public Health

Substantial evidence has to be gathered on whether the support of Functional Foods by public health measures would be the best way to use scarce resources. Two alternative scenarios that warrant investigation are: 1) supply of nutraceutical ingredients in pill form aimed at 'at risk' groups and 2) consumer education on diet and lifestyle.

### Research requirements

The group recommend the investigation of more intermediate, surrogate markers of any pathological processes and establish a clear link to the clinical endpoints. The further development of biomarkers is the key to validating health claims. In addition, the group recommends further funding of public perception research, in order to restore the lost trust of consumers in the food market.

### Final Report:

R. Chadwick, S. Henson, G. Koenen, M. Liakopoulos, C. Midden, B. Moseley, A. Palou, G. Rechkemmer, D. Schröder, A. von Wright (2004): Functional Foods. Springer-Verlag, Berlin, ISBN 3-540-20120-3 (book series: Wissenschaftsethik und Technikfolgenbeurteilung, vol. 20)

#### 1.2.4 Project Members

Chair: *Professor Ruth Chadwick, BA, B.Phil, D.Phil, LL.B*

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*mr. Gerrit Koenen, MSc, LL.M*

Inspectorate for Health Prevention and Veterinary policy  
Ministry of Health, Welfare and Sports, The Netherlands

*Professor Bevan Moseley OBE, BSc, Ph.D.*

Institute of Food Research, University of Reading, UK

*Professor Dr. Cees Midden*

Faculty of Technology Management  
Eindhoven University of Technology, The Netherlands

*Professor Dr. Dr. habil. Gerhard Rechkemmer*

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*Professor Atte von Wright, FK, FL, Ph.D.*

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Project coordination: Dr. Miltos Ladikas  
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Duration: 1/01 – 12/02

External advisory:

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Institute for Environment, Philosophy and Public Policy, Lancaster University, UK

*Professor Andreu Palou, MSc, Ph.D.*

Department de Biologia, Fonamental I Ciencies de la Salut, Universitat de les Illes Balears, Spain

### 1.3 Embryo Research in Pluralistic Europe (completed)

#### 1.3.1 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 aimed at developing new therapies.

These new techniques, which have been made available along with the development of In vitro Fertilisation (IVF), have stimulated a controversial debate as to what aims and to what extent experiments on human embryos are morally acceptable. Though there is a general consensus among scientists and among the general public that human embryos deserve greater respect than embryos of other species, a consensus on appropriate regulations, governing 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 even necessary.

The project, therefore, was devoted particular attention to 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 back-

grounds within the different European countries are taken into account and discussed.

### *1.3.2 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 in January 2002 at the Europäische Akademie in Bad Neuenahr-Ahrweiler. The members of the project group are experts in various scientific fields 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, on 23.–24.01.01 at the Europäische Akademie, some first drafts (so-called "seeding 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 on 11.–12.05.01 at the Max-Delbrück-Centre in Berlin-Buch. Talks 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 determined in a third meeting, which took place on 3.–4.08.01 in Bad Neuenahr-Ahrweiler.

In a fourth meeting of the project group on 20.–21.10.01 in Bad Neuenahr-Ahrweiler two other experts were invited to give talks 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'. Priv.-Doz. 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 on 8.–9.12.01 at the Berlin Brandenburgische Akademie der Wissenschaften. Professor Dr. Barbara Knowles, Director of Research of The Jackson Laboratory, Maine USA

was invited as a 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 on 9.–10.03.02 at the Novartis Foundation in London. Besides the recent development of the drafts, Professor Dr. Robin Lovell-Badge, in his capacity as a member of the advisory body 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 on 24.–25.05.02 at the Berlin Brandenburgische Akademie der Wissenschaften. 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 Beylveled, 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 on 21.–22.09.02 at the University of Warsaw, 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 Hołowka 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 on the 8.–9.11.02 at the Novartis Foundation, London. 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 on the 14.–15.12.02 at the BBVA Foundation in Madrid. A final meeting took place in April 2003 to include the chapter on the sociological dimensions of embryo research. The chapter is based on a current survey on embryo research related questions in various European states.

### 1.3.3 Results

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

In view of the important medical improvements science is able to envisage 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 allows. Only rationally founded regulations can reasonably be expected to be agreed upon throughout a pluralistic society like the European states. Regarding the latter, 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 unfounded – at least for the time being. A similar error 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 on 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 are not 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 competent 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.

### 1.3.4 *Project Members*

Chair: *Professor Dr. Davor Solter*

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Fundacja Zdrowie, Warszawa

*Professor Dr. Hans Lilie*

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Dr. Christoph Mandla, Universität Halle

#### Associated research fellow:

Dr. Michael Selgelid, University of the Witwatersrand, Johannesburg

### 1.3.5 *Publications*

Friele, Minou Bernadette (ed): *Embryo Experimentation in Europe. Bio-medical, Legal, and Philosophical Aspects*, Graue Reihe No. 24, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler, 02/01

Selgelid, Michael J. (2002), *Societal Decision Making and the New Eugenics*, Graue Reihe No. 30, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler, 4/02

Final report:

D. Solter, D. Beyleveld, M. B. Friele, J. Holówka, H. Lilie, R. Lovell-Badge, C. Mandla, U. Martin, R. Pardo Avellaneda (2003): Embryo Research in Pluralistic Europe. Springer-Verlag, Berlin, ISBN 3-540-20379-6 (book series: Wissenschaftsethik und Technikfolgenbeurteilung, vol. 21)

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## **1.4 Environmental Standards. Low Dose Effect Relations and their Risk Evaluation (completed)**

### *1.4.1 Task*

Various natural processes, the technological development and the increase of population density, are accompanied by releases of toxic agents of physical and chemical nature into the environment. This development has led to increasing exposures of all living organisms including humans. Therefore it has become necessary to limit these exposures and to develop certain protective measures for the environment and living organisms. Such processes have to be based on the 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 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 as to 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, feasibility and the consequences of these procedures have been discussed in the installed project group. Furthermore, recommendations for research requirements and for implementation rules that may be useful for the environmental and research policy have been developed. In this context, the international situation with a special focus on Europe has been taken into account.

### *1.4.2 Method*

During a period of three years the project group "Environmental standards. Dose-effect relations in the low dose range and their risk evaluation" examined this problem in an interdisciplinary manner for politics and research.

After a preliminary project phase, the constituent assembly of the project group took place on 17./18.1.2001 in Bad Neuenahr-Ahrweiler. The group consisted 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 have been all linked together to evaluate the standard-setting process in the low dose range.

Seven working meetings of the project group in Bad Neuenahr-Ahrweiler in 2001 and 2002, with a few personnel changes, were able 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 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 on 15.7.2002 in the Institute for Occupational Physiology in Dortmund served to discuss special issues in toxicology and radiobiology in a smaller circle. These meetings enabled the preparation of a first bundle of drafts of the whole project, which were then discussed at a meeting on 19./20. August at the Karolinska Institute in Stockholm. This collection of drafts was the basis for the Mid-term review process.

The project group's Mid-term Meeting took place on 12./13.9.2002 in Bad Neuenahr-Ahrweiler. At this meeting, the problem involved in extrapolating from high to low doses was discussed among a broader interdisciplinary panel of experts. The meeting emphasised the sound scientific content of the presented drafts and gave valuable comments on the results that had been obtained by the group so far. 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 presented by Professor Dr. Maria Blettner (Universität Bielefeld), Professor Dr. Monika Böhm (Universität 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 (Technische Universität Dresden), Professor Dr. Georg F. Kahl (Universität 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 Juelich).

A meeting on 22.11.2002 served to co-ordinate the radiological and the toxicological parts of the study in terms of a common framework.

On 9./10.1.2003, further drafts were discussed. Subjects were, amongst others, radiobiological considerations, epidemiology, risk evaluation and communication. In the field of toxicology, the problem of topoisomerase II poisons contained in food, amongst other subjects, was discussed. From a theoretical consideration this poison should show a linear, non-threshold, dose-effect relationship. It had been shown to be carcinogenic in animal experiments and is suspected of playing an important role in childhood leukaemia, even at low doses. The problem of hypothesis testing was examined in terms of the philosophy of science. Different standards of

proof have been found in the various disciplines concerned. Experimental and hypothesis-building approaches vary in different experiments aimed at finding dose-response relationships and thresholds.

On 14.2.2003, another meeting was held to finalize the common framework of the radiological and toxicological aspects.

A final, thorough check of the draft of the study report was carried out on 13.3.2003. The main focus was on coherency and adequate cross-references. Additionally, the executive summary and the recommendations were drafted.

On 10.6.2003, the project group on "Environmental standards. Low dose effect relations and their risk evaluation" held its final meeting. The session was hosted by the Norwegian Academy of Science and Humanities in Oslo. At this meeting the texts were finalised and recommendations in the different areas of standard-setting were elaborated. Besides pure scientific recommendations, the main attention was focussed on suggestions for regulators.

### *1.4.3 Results/Publication*

The discussions of the project group on "Environmental standards – risks and regulatory processes in the low-dose range" showed that the interdisciplinary dialogue and interaction is of utmost importance in dealing with and setting environmental standards. In the modern, industrialised world, with high human population densities, it is necessary to achieve a balance between the development and the operation of efficient technologies, on the one hand, and the maintenance of a healthy and sustainable environment for present-day life and for that of future generations, on the other hand. Therefore regulations, including the setting of environmental standards, are very important.

These challenges cannot be met without rational decision-making processes and should be based on:

- sound scientific data about the effects of toxic agents and their mechanisms,
- discussion of ethical and social implications, including the uncertainties of the scientific evaluations, as well as a communication of risks and benefits under conditions of transparency,
- procedures that promote rationality, provide legitimacy and ensure consistency with legal, especially constitutional, mandates and constraints.

In consideration of these fundamental requirements, and acknowledging the actual state of knowledge, the project group has come to the following recommendations:

1. Environmental standard-setting has to be based on reliable, sound scientific data.

Critical assessments of the dose-responses have to be based on sound epidemiological and experimental investigations. In this connection, the knowledge about the shape of the dose-response curves in the low-dose range is essential. Two principal dose-responses are distinguished: A dose-response with a threshold dose and a dose-response without a threshold dose.

2. The distinction of harmful agents into two groups, those that act *with a threshold* and those that act *without a threshold* should be maintained.

The question of a threshold is crucial for risk evaluation, especially in the low-dose range and has therefore to be investigated intensively. These issues, which differ from agent to agent with respect to the biological effects and peculiarities of the various agents, must be considered thoroughly.

3. When a *threshold dose* can be verified on the basis of scientific data, regulatory standards should be set *below* the threshold level. Safety factors should be used in these cases to allow for uncertainties in the evaluation procedures and individual differences in susceptibility.

Such dose-responses are usually observed for acute effects and non-malignant tissue damage, originating from many damaged cells.

In contrast, for mutagens and carcinogens with genotoxic mechanisms, a dose-response without a threshold appears very likely, which makes those agents more difficult to regulate through standard-setting. The complex processes of carcinogenesis are far from being fully understood.

Therefore, setting standards for carcinogens cannot be performed solely on the basis of sound scientific findings. Conventions have to be established that contain as much up-to-date scientific knowledge as possible.

4. For mutagens and most genotoxic carcinogens, e.g. ionising radiation, where there is no *evidence for a threshold dose*, the LNT (*linear-no-threshold*) model<sup>1</sup> remains the most appropriate convention for risk evaluation by extrapolation into the low-dose range and for the control of carcinogens. Its simplicity for risk management is advantageous. Its application is therefore recommended for assessing the risk of genotoxic agents.

<sup>1</sup> Due to the inherent complexity regarding mechanisms and postulated biological endpoints, evaluations of dose-response relationships will need to include a number of assumptions, auxiliary hypotheses and simplifications. Thus the linear extrapolation of dose-response curves at low doses is better described as a LNT model rather than the LNT hypothesis.

This recommendation is not based on the assumption that the dose-response curve is linear in the whole range from low to high doses but it can be taken as a linear curve in the important low-dose range. Indeed, many radiobiological effects have been found in the past decade that do not exhibit linearity in the higher dose ranges. These include expression of different genes at lower than at medium/higher doses, DNA-damage-repair capacity, adaptive responses, induction of genomic instability, bystander effects and low-dose hypersensitivity. No clear conclusion could be achieved up to now, how these effects influence the shape of the dose-response curve.

The possible alternatives for dose-responses which are discussed in the scientific community and for which scientific data are available should be considered within risk evaluation processes. For standard-setting, however, such models should be used that have a universal and broad validity and that include groups with different susceptibilities with respect to gender, age groups and genetic dispositions, as well as varying tissues. This general validity is probably best covered for genotoxic agents by the LNT model in order to achieve the profound and safe protection of environment and human health.

However, there are a number of different mechanisms that may lead to a threshold in dose-response curves, and, even for chemical carcinogens, at least three different types of thresholds may be identified. When discussing thresholds, it is important to be clear whether the hypothesis or model postulated refers to an absolute (no adverse effect below a certain exposure level), practical (no observable effect below a level) or apparent threshold (due to a protective or adaptive response initiated by the toxin). This leads the project group to suggest a classification of three groups of carcinogens based on the above-described distinction of thresholds and on the mechanisms of the chemicals which have been discussed in Chapter 7 of the final report:

5. Group 1

Genotoxic carcinogens without a threshold, where a LNT model should be applied.

Group 2

Genotoxic substances, where *sufficient scientific* data, concerning the underlying mechanisms, suggest existence of a *practical threshold*.

Group 3

*Non-genotoxic carcinogens*: These compounds display a clear threshold of carcinogenicity, and health-based exposure limits may be established by starting from "no observed adverse effect level" NOAEL and the introduction of a safety/uncertainty factor, if this is applicable.

The dose-responses after low exposures can usually only be obtained by extrapolations from observed effects in higher dose ranges. This proves true for all mutagens and carcinogens. Since the extrapolation proce-

dures carry inherent uncertainties but at the same time they are unavoidable, a better understanding of the complex mechanisms in multistep processes is very important for an improved prediction of health effects in the low-dose range. Knowledge of these mechanisms gives guidance for the extrapolation.

6. Further research of the mechanisms involved in the multistep process of carcinogenesis is needed to clarify the different mechanisms of the various agents to reduce the uncertainties.

The question of scientific plausibility regarding the toxicity of carcinogens is not something that can be settled by referring to a single factor. Decisions need to be based on a multi-criteria evaluation, including consideration of the available knowledge on epidemiology, animal experiments, cellular and molecular studies, biological mechanisms, and models. Safety or extrapolation factors used for setting standards should reflect the level of uncertainty in the various criteria.

7. A harmonisation of the principles of standard-setting within the fields of ionising radiation and genotoxic chemicals is recommended as the development of mutations and cancers is similar after exposures to ionising radiation and genotoxic chemicals, except for the primary events. Exposures from natural sources can be used as "benchmarks" for standard-setting. Differences in susceptibility of groups and individuals must be considered.

Except for the primary events, the development of mutations and cancers is similar after exposures to ionising radiation and genotoxic chemicals. These similarities of mechanisms are conducive to harmonising the principles of standard-setting within these two fields. Harmonisation of crucial criteria for risk assessment, such as considerations for selecting extrapolation factors, use of risk models, treatment of carcinogenic substances with a (practical) threshold, and consideration of susceptibility in the absence of data is desirable. This concerns both the national and the European levels. By contrast, harmonisation of "technical" criteria, such as conversion factors should be avoided, as there is no scientific basis for standardisation.

8. *Ambient quality standards* should not only be set for threshold substances (*Groups 2 and 3*) but also for substances that are not associated with a threshold (*Group 1*), such as most carcinogenic (genotoxic) substances. However, ambient quality standards for no-threshold substances should be *supplemented by minimisation requirements* in order to further reduce a risk that cannot be adequately ascertained. In case of carcinogenic substances that are associated with an *absolute or practical* threshold (*Groups 2 and 3*), this additional safety precaution is not necessary.

Ambient quality standards for no-threshold substances should be based on a common measure of quantified tolerable risk. At least gross divergences in tolerable risk figures for different carcinogens require special justification.

Exposures from natural sources and their possible risks should be considered for comparisons with exposures from man-made sources and for standard-setting. This is especially possible in the case of ionising radiation but also of some toxic chemicals.

9. Differences of susceptibility must be attributed more weight both in risk assessment and risk management.

However, the delimitation and reasonable size of a susceptible group is not at all clear. It is certainly not advisable and feasible to take into account very small susceptible groups leading in its extreme to an individual. The use of standard groups of susceptibility (vulnerable groups) is legitimate, yet the risk assessor and regulator should also aim to include diffuse groups (e.g. persons with immune defects) where this is practicable and not inconsistent with effective protection of the vast majority of persons at risk. One possible response to unknown or diffuse variations in susceptibility is the use of an additional safety factor.

10. A weighing of societal costs against benefits is necessary when decisions are made concerning the acceptance and acceptability of risks. Not only monetary values but also other values, e.g. of ethical nature, have to be taken into account. Distribution of risks and benefits should be considered without neglecting practicality.

The consideration of societal costs associated with risk regulation and comparison with the expected benefits including, to the extent practicable, side effects and alternative actions to reduce risks, constitutes a legitimate component of precautionary risk management. However, formal cost/benefit analyses should only be used with great caution as monetarisation may distort the whole balancing process. It is crucial that not just monetary values are being taken into account in such analyses, but the whole range of values that are relevant to the decision.

The distribution of costs and benefits is highly important for what risks can be considered ethically acceptable. It is very problematic to impose risks on people who are not getting their share in the benefits that accrue from the imposition of risks. From an ethical point of view one might therefore want differentiated levels of acceptable risk, one for people who themselves benefit from the risk and one for enterprises that primarily benefit others. Distributional concerns are particularly important when those who benefit are already well off, while those who suffer the risk are badly off, for example live in areas that are exposed to pollu-

tion or other negative effects of the activity. It is a challenge for legislators to develop rules that reflect such distributional concerns. However, such rules must consider practicality and generic benefits from which people adversely affected in this living or working environment may profit.

11. Acceptability is a normative notion and has a high value. In order to achieve acceptability, an effective risk communication together with a high degree of transparency regarding the preparation of decisions on risk assessment and risk management is necessary.

For the whole procedure of setting environmental standards it is highly important that both, the composition of the relevant bodies, and the procedures they follow in their deliberations and decisions are transparent. It must be as clear as possible how they reach their decision, so that the general public can be confident that their interests are well taken care of. In the process of risk assessment a scientific dialogue and in the process of risk management an open presentation of interests and values must be organised in order to achieve more rationality, legitimacy and acceptance of the relevant decisions.

Firstly, transparency is imperative in the scientific discourse, when the risk is assessed, characterised, and evaluated. Consequently, the scientific community should be able to control and repeat the relevant studies in order to avoid debates about the results. Secondly, when the results of the study are used by the risk manager and/or decision-maker, transparency is needed for involving the public in the discussion and for communicating to the public on what basis the decisions were made and the standards set.

Since the ultimate goal of risk communication is acceptance of the decision by the public at large, careful planning is necessary. This involves: preparation of the information about the scientific findings and the whole decision-making process with its background in an understandable way, selection of speakers and audiences, providing information about the beneficial as well as deleterious aspects and constructive relations to the media. The mechanisms to employ could be: public hearings, press releases, scientific journals, modern information technology, statements of trustworthy officials, i.e. scientists, politicians, medical doctors, teachers, etc. One of the problems encountered in the past is that there can be opinions prevailing within a smaller group of the public on the topic in question which are not based on scientific insights but rather on extreme emotional interpretations. Even though such a minority can create an opposition, the decision-makers would be well advised to give such irrational movements of very small and unrepresentative groups or individuals only limited attention as this will increase the opponents' credibility for the public.

12. In the risk evaluation and standard-setting process the rights and potential concerns also of those who cannot be directly heard should be considered.

"Silent victims", people who are handicapped or have little access to media, and no influence in elections, must never be forgotten when policies are made. One should see to it that silent victims are represented by people who know their experiences and concerns.

Future generations have no possibility to influence our discussions and decisions. Yet we owe them a decent share of the world's resources and should not turn our pollution and environmental problems over to them. When decisions are made, we should therefore pay close attention to environmental concerns, especially irreversible processes. Two aspects have especially to be considered: the long-lasting persistence of toxic agents and hereditary effects of the agents. Such concerns should be adequately reflected in legislation.

13. The bodies that give advice or make decisions concerning setting of environmental standards should include representatives from all competent disciplines. The interests of affected groups should be represented as well. It has to be made sure that the experts are knowledgeable and experienced on scientific grounds. They have to be up to date with the latest findings.

Scientists including ecologists, ethicists, legal specialists, other experts such as economists and representatives of affected groups or affected individuals should participate in the decision-making process. Scientists have to be familiar with the scientific background for the specific risk evaluation. They have to be aware of the feasible alternatives and the probabilities of the various consequences. The expertise of ecologists has to be included. Where there is disagreement between competent and well-informed scientists, all main views should be represented. Ethicists should be familiar with the latest research on what different factors are ethically relevant in connection with the issue at hand and how they should be weighted against one another. Legal specialists must be familiar with legislation and jurisprudence in this area and should also have knowledge of the likely social impacts of alternative kinds of regulation. Other experts will often be needed, for example economists, who can help to clarify the often complicated economic effects of the various alternatives and who can also suggest and evaluate various economic incentives and compensation schemes that might be considered. Representatives of the groups that might be affected have to be involved in the process of decision making and should get a clear understanding of the situation. One should find ways to ensure that "silent victims" are represented, such as under-privileged and handicapped, who often are forgotten when poli-

cies are made. It is also highly important that the interests of future generations, which cannot attract attention, be adequately represented. Elected constitutional bodies should make the ultimate decisions.

One of the main difficulties certainly lies in balancing the manifold aspects, which have been discussed in the foregoing text. It should be kept in mind that the scientific knowledge about the effects and the dose-responses is the most important basis for setting environmental standards for toxic agents. However, it must also be clear that all toxic exposures are only permissible and justified if they are associated with a benefit to the society and if the risks are tolerable. The decisions about standards have to be made on the basis of constitutional mechanisms, which include societal acceptance.

Final Report:

C. Streffer, H. Bolt, D. Follesdal, P. Hall, J. G. Hengstler, P. Jacob, D. Oughton, K. Prieb, E. Reh binder, E. Swaton (2004): *Low Dose Exposures in the Environment. Dose-Effect Relations and Risk Evaluation*. Springer-Verlag, Berlin, ISBN 3-540-21083-0 (book series: Wissenschaftsethik und Technikfolgenbeurteilung, vol. 23)

#### 1.4.4 Project Members

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Duration: 01/01 – 12/02

### 1.5 Incentives for Organ Donation (Duration: 7/03 – 12/05)

#### 1.5.1 Background and Tasks

Today transplantation medicine has matured from the experimental status and is well established. In many cases it represents the only live saving therapy existing and it has shown to improve patients' quality of life in many other cases. In most European countries transplantation medicine has been set in legal frames within the last ten years, which brought about more legal certainty and reflected a general public acceptance for this form of therapy. However the hope that a legal implementation would raise organ donation rates did not become true. Quite the contrary is the case. Organ donation rates mostly remained unchanged and would even have fallen, if a rising number of living-donor transplants had not compensated falling cadaveric organ donation rates. Furthermore it is prognosticated that the gap between the number of patients on the waiting lists and the number of available organs is even going to increase. Consequently, the number of patients that will die while waiting for a transplant is likely to rise as well. The reason for this worsening situation is a falling number of brain deaths, due to improved traffic safety, e.g. the development of airbags. At the same time, the number of patients that are going to be in need of an organ is expected to rise, due to, for example, an increased number of diabetes II patients resulting from a rising number elderly or overweight people. Thus, strategies to improve organ donation rates need to be discussed again. Recent reports documented first cases of illegal organ donations even within Europe, reflecting the severeness and topical reality of this issue.

One factor that influences cadaveric organ donation rates is the existence of different procedures to determine the will of potential donors. In the *opting-out* system the consent of organ donors is presumed. Citizens have to opt out actively if they do not want to donate organs. In the *opting-in* system, citizens need actively to give their consent for organ donation. Since countries with the *opting-out* system generally have higher organ donation rates than countries without it, a correlation is discussed. However, the overall severe shortage of transplants remains unchanged in all European countries. Strategies and incentives to increase organ availability and thereby to improve this situation are increasingly discussed. In the course of this discussion, voices have recently been raised, propagating a limited legalisation of trading organs.

The study will first focus on the discrepancy between a generally positive attitude towards organ donation and the substantially lower actual organ donation rate. Special emphasis will be placed on a moral analysis of a "market for organs", similar to markets for and the resulting competition for pharmaceuticals or health insurance policies. Furthermore, novel proposals towards providing incentives for organ donation and the moral

problems involved - i.e. ownership of organs, assurance of voluntariness of organ donation or organ import from Third World countries - will be discussed.

### *1.5.2 Work Programme*

To analyse the current situation and possible approaches to tackle the problem, a project team has been constituted with representatives from the following disciplines: transplantation medicine, organisation of transplantation medicine, economy, law, sociology and philosophy. On the basis of interdisciplinary discussions within the project team and regular contact with relevant scientific communities, an analysis report will be finalised into a common text according to the principle of consensus. That will include specific recommendations, targeting policy-making institutes. The finalised text will then be presented to the Scientific Advisory Board of the Europäische Akademie for approval before publication. The project work has been divided into three main phases:

#### Phase 1, June 2003 – December 2004: Setting the work plan

During the first phase of the project the project group was constituted and a working plan developed on the basis of interdisciplinary discussions within the project group and the following inputs from the scientific communities: In August 2003 Professor Dr. N. Neuhaus, Berlin, hosted the project group during surgery in his transplantation centre. Professor Dr. P. Schootsmans, Leuven, gave a talk on the ethical implications of organ transplantations. During a workshop in December 2004, with 22 participants the following topics were discussed: the duty of organ trading versus reciprocity, possibilities to expand live organ donation, "altruism" in organ transplantation, special aspects of kidney donation, ethical aspects on incentives in organ donation, and insurances for live organ donors. External Speakers were: S. Wille, Mannheim; Professor Dr. C. Blankhard, Berlin, Professor Dr. H.L. Schreiber, Göttingen, Professor Dr. L. Paul, Mainz; Professor Dr. G. Thiel, Basel, Professor Dr. Dr.h.c. C.F. Gethmann, Bad Neuenahr; Professor Dr. W. Lübke, Berlin, RA U. Riedel, Berlin; Professor Dr. G. Gaertner, Mainz.

#### Phase 2, July 2004 – August 2005: Preparing the 'seeding texts'

During this phase, the project group 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.

#### Phase 3, August 2005 – December 2005: Mid-term Meeting and the final report

The individual papers created as "seeding texts" were discussed at a scientific workshop with outside experts acting as reviewers.

### 1.5.3 Results/Publications

Following the approval by the Scientific Advisory Board 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.

### 1.5.4 Project Members

Chair: *Professor Dr. rer. pol. Friedrich Breyer*, Chair of Economic and Social Policy, Department of Economics, University of Konstanz

*Professor Dr. jur. Wolfgang van den Daele*, Director of the research unit "Standard-setting and Environment", Wissenschaftszentrum Berlin für Sozialforschung; Professor for Sociology at the Freie Universität Berlin, Germany

*Professor Dr. med. Gundolf Gubernatis*, managing doctor for organ transplantation in the region "Nord" of Germany on behalf of the *Deutsche Stiftung Organtransplantation* (German Organ Transplantation Foundation)

*Professor Dr. Hartmut Kliemt*, Faculty of Philosophy, Universität Duisburg-Essen

*Professor Dr. jur. Dr. med. Christian Kopetzki*, Faculty of Law, Institute for Public Law/Law of Medicine, Universität Wien; additional: Institute for Ethics and Law in Medicine

*Professor Dr. jur. Jochen Taupitz*, Chair for Civil Law, Civil Procedural Law, International Private Law, and Comparative Law at the Universität Mannheim

*Professor Dr. med. Hans Jürgen Schlitt*, Director of the Clinic and Polyclinic for Surgery, Universität Regensburg

Project coordination: Dr. phil. Margret Engelhard, Dipl.-Biol.  
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## 1.6 Nanomaterials, Nanodevices, Nanocomputing. Determination of Present Position and Perspectives (Duration: 7/03 – 12/05)

### 1.6.1 Background and Tasks

The Europäische Akademie's project "Nanomaterials, Nanodevices, Nanocomputing. Determination of Present Position and Perspectives", scheduled from July 2003 until December 2005, deals with topics that are summarized as "Nanotechnology" in public discussion. The latter is frequently referred to as a key technology of the 21<sup>st</sup> century. Hopes on innovative materials, integrated signal processing, efficient energy handling and novel medical therapies exist. The project examines which areas of Nanotechnology will assume societal relevance in the near future and how a scientific shaping of this technology can be realized.

Up to now, the term "Nano" has a positive connotation in the media, and funds for it are readily available. This has caused its increased, sometimes unjustified, use when describing research activities. On account of this, one of the project groups' aims was to assign scientific activities unambiguously, using a new definition of Nanotechnology devised by the Europäische Akademie's study group "Miniaturization and Material Properties". According to this definition, Nanotechnology is not characterized by structure dimensions in the name giving nanometer regime (these being typical of classical chemistry and biology as well), but by the emergence and utilization of novel properties that are not known from the macroscopic world and have to be described in a quantum mechanical way. Following this notion, purely geometric miniaturization without novel properties shall not be understood as Nanotechnology.

The project exemplarily treats various research areas of Nanotechnology which are divided into three major blocks: Materials, information storage and biomedical applications. Purely medical applications will not be considered due to their amount and to the fact that respective studies have been carried out before. Concerns about potential hazards from Nanotechnology, e.g. caused by ultrafine dusts, are met through integration of toxicological expertise into the project group.

In accordance with the Europäische Akademie's interdisciplinary way of work, the views of the group's nontechnological experts, such as representatives from ethics, theory of science and economy, are to be incorporated into the study as well, leading to an integrated view in which the borders of the academic disciplines are crossed. The formulation of acting recommendations for decision-makers in relevant society sectors like politics, research and industry will be an essential result of the study.

### *1.6.2 Work Programme*

Three major project phases can be identified:

#### Pre-Phase, July 2003 – December 2003: Setting the agenda

In this phase, the group set up the general strategy for the project, chose the topics to be covered within the study, assigned responsibilities for them amongst the members and devised a basic structure of the book to be published.

#### Main Phase 1, January 2004 – October 2004: Seeding texts and Mid-term Meeting

During this phase, the group members created seeding texts as a basis for subsequent discussions and integrated them into a study draft. The latter was presented at the Mid-Term Meeting to the following external referees:

*Dr. Gerd Bachmann*

VDI Technologiezentrum Düsseldorf

*Professor Dr. Peter Bäuerle*

Abteilung Organische Chemie II

Universität Ulm

*Professor Dr. Paul Borm*

Hogeschool Zuyd, Herleen, Netherlands

*Professor Dr. Harald Fuchs*

Fachbereich Physik

Universität Münster

*Professor Dr. Uwe Hartmann*

FR 10.2 – Experimentalphysik

Universität des Saarlandes, Saarbrücken

*Professor Dr. Christoph Hubig*

Institut für Philosophie

Universität Stuttgart

*Professor Dr. Martin Möhrle*

Lehrstuhl für Betriebswirtschaftslehre

Universität Bremen

*Professor Dr. Reinhard Nesper*

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ETH Zürich, Switzerland

*Professor Dr. Andreas Offenhäusser*

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*Dr. Markus Pridöhl*

Degussa AG, Hanau

*Dr. Eberhard Seitz*

Projektträger Jülich,

Forschungszentrum Jülich GmbH

(Formerly Research Directorate Generale DG-RTD G4 Nanosciences and Nanotechnology, European Commission, Brussels)

### Main Phase 2, November 2004 – December 2005: Editing and publishing of final book texts

In this final phase, the group will incorporate the referees' suggestions into the study, enhance the degree of linkage between the different text elements and formulate acting recommendations, based on the principle of consensus.

#### *1.6.3 Results/Publications*

After having received the Europäische Akademie Scientific Advisory Board's approval, the study results will be published as an academic book that is pre-

sented to representatives from politics and to the interested public. This presentation is held as an official act and may take place repeatedly. Further ways of disseminating the results will be publications and lectures by the group members.

### *1.6.4 Project Members*

Chair: *Professor Dr. Günter Schmid*

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*Professor Dr. Armin Grunwald*

Institut für Technikfolgenabschätzung und Systemanalyse  
Forschungszentrum Karlsruhe GmbH

*Dr. Werner Günwald*

formerly Robert Bosch GmbH, Gerlingen

*Professor Dr. Hans-Joachim Güntherodt*

Institut für Physik  
Universität Basel, Switzerland

*Professor Dr. Heinrich Hofmann*

DMX Ecublens  
EPF Lausanne, Switzerland

*Dr. Harald Krug*

Institut für Toxikologie und Genetik  
Forschungszentrum Karlsruhe GmbH

*Professor Dr. Peter Janich*

Lehrstuhl 1 für Philosophie  
Philipps-Universität Marburg

*Dr. Marcel Mayor*

Institut für Nanotechnologie  
Forschungszentrum Karlsruhe GmbH

*Professor Dr. Ulrich Simon*

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*Professor Dr. Viola Vogel*

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### 1.7. Intervening in the Psyche. Novel Possibilities as Social Challenges (Duration: 7/03 – 12/05)

#### 1.7.1 *Background and Tasks*

In recent years, scientific and technical advances have led to a number of innovations in the medical field that either open up new possibilities for deliberately intervening in the psyche or are fraught with the risk of having undesired side-effects on psychic states and functions: For instance, electrodes are implanted permanently in the brain making so-called Deep Brain Stimulation feasible. Also, brain tissue of aborted fetuses is used to prepare neural grafts that are injected in certain sites of a patient's brain. Initially, these minimally invasive techniques of brain surgery have been adopted mainly for the treatment of Parkinson's disease focusing accordingly on motor deficits. Just lately, their overt potential for purposefully acting on the psyche has been addressed with clinical trials. So, Deep Brain Stimulation came under scrutiny as a last resort for severe cases of obsessive-compulsive disorder and neurotransplantation has been examined as a possible remedy for Huntington's disease. In another way the psyche becomes the target of medical measures when lost sensory functions are tried to be restored by neuro-bionic implants. Take, as examples, subretinal implants for blind people or auditory brainstem implants by means of which some semblance of hearing can be provided for the deaf. Finally, once again in a different way, our scope of interventions is expanded by newly developed or differently applied psycho-pharmaceutical drugs.

In spite of the obvious diversity of these intervention options, the public debates pertaining to their usage are dominated by quite similar considerations. Even though all of them have been developed for the benefit of people suffering from psychiatric disorders or diminished capacities, the public response to them is not entirely positive. One reason for this reservation is certainly that the new techniques might not be used for therapeutic purposes only. If, for instance, a malfunctioning sensory modality can be restored by means of neuro-bionic implants to an average level of functioning, then a sensory modality of normal functioning could also be enhanced to a level above the average by applying the same technique in a modified way. The same holds true for psycho-pharmaceutical drugs. Consider, for example, those amphetamine derivatives (like most notably "Ritalin") that nowadays are extensively applied for the treatment of children who have been diagnosed with Attention Deficit/Hyperactivity Disorder (ADHD). It is a widely acknowledged problem that these drugs can not only be used for the betterment of the reduced attention capacity of hyperactive children, but that they also can be abused – for instance by parents – to boost a normal attention capacity.

The general strategy to discriminate between legitimate and illegitimate interventions with reference to their being used therapeutically or non-

therapeutically can be questioned in at least two ways: First of all there is the difficulty of deciding whether a treatment of a person's psychic state is required or not. The reason for this difficulty is that regarding the psyche it is particularly hard to tell "normal" or "healthy" from "abnormal" or "disordered" states. – That, for instance, these distinctions are liable to change becomes obvious looking at the case of ADHD: A child that in former times simply would have been considered as an all too healthy menace nowadays might be held to suffer from a disorder compromising its capacity to pay attention.

But even taking the distinction between therapeutic and non-therapeutic interventions in the psyche for granted, one might still ask, why, in general, the former but not the latter should be acceptable from a normative point of view. Just consider the related case of plastic surgery to see that this question can be justifiably raised: Plastic surgery, after all, is not merely used to restore someone's features in case of mutilation due to an accident or the like. On the contrary, it is mainly used to correct minor and sometimes minute deviations from socially established beauty standards. Some people might regard it as a weakness of character to undergo plastic surgery without any good reason, but there is no clear consensus on what counts as a good reason in this context. More importantly, not even those being dismissive about persons striving for cosmetic perfection by means of plastic surgery would react on this conduct with moral contempt in a narrow sense. Hence, it seems premature to rest the case against particular interventions on their not being used for therapeutic purposes alone.

The comparison with plastic surgery is instructive in yet another respect. Those who object excessive usage of this kind of surgical interventions sometimes point out the danger of a loss of individuality. In a similar vein one could argue that the growing tendency towards standardization that has already occupied our outward appearance is now catching hold of our psyche as well. Occasionally these misgivings are expressed in science fiction scenarios fraught with "Cyborg"-soldiers that do not only look more or less alike, but who are equipped with various implants providing all of them with the same supernatural sensory capacities, pain tolerance, and aggressiveness. Looking at the state-of-the-art these scenarios seem rather far-fetched, but they are motivated by concerns that surely deserve consideration.

Many of the novel kinds of intervention act on the psyche in such a way that not only the individuality in the specified sense, but also the identity of those persons subjected to them might be called into question. When someone is receiving an artificial hip joint nobody would doubt that afterwards he or she is still the same person in any relevant sense as before. Intuitively, the same holds true for interventions on sensory capacities. At first glance it does not make a fundamental difference whether someone gets new glasses or receives a subretinal implant – at

least as far as the integrity of a person's identity is concerned. But what about auditory brainstem implants that are more intimately connected to the brain as the putative site of our personal identity? The more profound the impact of a particular technique is on the working of the brain, the more likely it seems to alter a patient's identity in some way. Just imagine a friend would get an artificial hippocampus implanted – a project that some American researchers are currently working on. Afterwards one might definitely wonder whether he or she is still the same person. However, the preliminary nature of these considerations has to be emphasized. It takes explicit and well-founded criteria to make sense of the idea that some interventions could affect a person's identity.

Apart from individuality and identity also autonomy belongs to those traits and capacities that certainly are of constitutive importance for human beings, and that some people suspect might be jeopardized by the new ways for intervening in the psyche. But, unfortunately, it is not at all clear what is actually meant by a loss of autonomy. The question looming large in Western philosophical tradition has been whether humans in general can be regarded as autonomous beings. The possibility of losing one's autonomy partially or completely has been much less elaborated upon. A good deal of conceptual work is required before one can start answering the empirical question whether any kind of intervention might threaten the individuality, identity or autonomy of those being subjected to it.

The main aim of the envisaged project dedicated to the new possibilities for intervening in the psyche mentioned above shall be to examine whether there is good reason for entertaining those different fears that we briefly touched upon. In order to do so, scientists from the various fields involved shall report on what kind of interventions are possible at present. Since a considerable part of the public debate is concerned not so much with current options but rather with future possibilities, the experts shall also make a prediction on foreseeable developments. In evaluating the consequences of these developments, the individual and the social level need to be taken into account separately. For instance, even though the potential effect of an intervention might look desirable to the person on which it is to be performed, public concerns can override this individual interest.

In order to live up to the normative dimension pertaining to the developments at issue, the ethical as well as the juridical perspective shall be considered. A guiding question for the ethical evaluation might be in which way our ever expanding scope of interventions could possibly change our understanding of what it means to be a human being. From a juridical point of view, it needs to be asked whether the currently effective legislation of European countries is appropriate for facing the normative challenge by the new possibilities for intervening in the psyche. A special difficulty in this regard stems from the fact that many of these

interventions are meant particularly or even exclusively for persons that are incapable of giving their informed consent to the respective treatment. For example, cochlea implants for the treatment of deafness are predominantly used for patients that are too young to give consent. Similarly, the mental status of patients with Huntington's disease may prevent them from sufficiently understanding the implications of an intended medical procedure to be able to give meaningful consent.

### *1.7.2. Current State of the Project*

The project group is still in the consolidation phase. A core group has been established with Professor Dr. Dirk Hartmann, Priv.-Doz. Dr. Steffen Rosahl, and Professor Dr. Reinhard Merkel, who is chair of the project group (for affiliations see below (4)). They have met three times so far and have already prepared papers that might serve as drafts for chapters of the final study. Two further experts joined the project group only recently after attending the third meeting that took place on 26 November 2004: Neurosurgeon Dr. Bart Nuttin was the coordinator of the first major clinical study concerning the possible benefits of Deep Brain Stimulation for the treatment of obsessive-compulsive disorder. Dr. Gerard Boer from the Netherlands Institute for Brain Research composed "Ethical Guidelines for the Use of Human Embryonic or Fetal Tissue for Experimental and Clinical Neurotransplantation and Research" on behalf of the *Network of European CNS Transplantation and Restoration* (NECTAR).

Given the current study outline, the project group needs to be complemented by a clinician, experienced with pharmaceutical interventions in the psyche. Professor Dr. Jörg Fegert who is one of Germany's leading experts on ADHD and who is taking a lively interest in ethical questions pertaining to psychopharmaceutical research, has been asked to account for this part of the project. Finally, Dr. Anne-Catherine Bachoud-Lévi has been invited to give a talk during the next meeting of the project group in February 2005. As the coordinator of the first experimental study examining neurotransplantation as a means to treat Huntington's disease, she will report on the results of these trials. Professor Fegert is considering to join the team from the Kick-off Meeting onwards that is scheduled for April 2005.

### *1.7.3 Publications*

During the preparatory stage of the project an expert meeting had been organized on "Intervening in Psychic Capacities. Neuroscience, Pharmacology, and the Medicalisation of New Spheres of Life". A number of contributions to this workshop that took place at the Europäische Akademie in May 2003 have been published lately in a focus section of *POIESIS & PRAXIS* (Vol. 2, No. 4, May 2004).

### 1.7.4 Project Members

Chair: *Professor Dr. iur. Reinhard Merkel*

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*Gerard Boer, PhD*

Department of Neuroregeneration at the Netherlands Institute for Brain Research, Amsterdam

*Professor Dr. phil. Dirk Hartmann*

Institute of Philosophy, Universität Duisburg-Essen, Campus Essen

*Bart Nuttin, MD, PhD*

Laboratory of Experimental Neurosurgery and Neuroanatomy at the University Hospital Gasthuisberg, Catholic University of Leuven

*Priv.-Doz. Dr. med. Steffen Rosahl*

Department of General Neurosurgery at the Universitätsklinik of Freiburg

Prospective Members:

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## 1.8 Environmental Noise. Risk Assessment and Regulations in the Traffic Sector (Duration: 7/03 – 12/05)

### 1.8.1 Background

According to the EU-Directive 2002/49/EC, environmental noise may be defined as unwanted and/or harmful outdoor sound, which is emitted by transportation and traffic on road, rail, and in the air as well as by other human activities.

Therefore, noise is potentially dangerous to human beings: For besides its subjective valuation, it objectively affects human health. Sleep disturbances and cardiovascular problems are some of the adverse effects brought into connection with noise. Furthermore, noise may also constitute an obstacle to social life, e.g. obstructing communication or mental skills. Consequently, these adverse impacts have raised wide public awareness and diverse national and international policies have put this topic on their agendas. As a result, a considerable number of legally binding instruments has been enacted in order to reduce noise emissions and to prevent exposure to it for the purpose of health protection. Nevertheless

and in spite of these measures, the public unease concerning noise pollution has not decreased. Special attention should be paid to the case of aircraft noise, since it may work as a paradigm for this apparently unsolved and somewhat paradox conflict: Air-travel is currently to be seen as a core element of increasingly accepted mobility and it is therefore endowed with a high economic potential to the fortune of the respective actors. Otherwise it is a growing noise source and the people affected seem to be becoming increasingly intolerant to noise exposure.

The pending societal conflict on adequate noise treatment gives reason for its scientific evaluation in favour of subsequent reasonable recommendations on this issue.

### *1.8.2 Tasks*

The a.m. noise problem seems to be especially urgent with respect to the growing demands for mobility on the part of modern society. It is therefore prudent to focus scientific reflection on the traffic sector and on the specific noise burdens that it creates for the general public. Scientific studies also have to take into consideration the obvious economic advantages provided by improved – albeit noisy – means of transport. The “topography” of the relevant questions proves to be highly diverse in disciplinary terms. Therefore, an interdisciplinary approach is needed in order to perform the task of evaluation and corresponding work will thus have to reflect and integrate contemporary knowledge from the following fields of research:

#### **Philosophy**

An evaluation of the conflict between a generally decreasing noise tolerance, on the one hand and growing mobility needs, on the other, may give normative guidance to resolve the noise problem. In conducting this task, it will be necessary to develop intersubjective criteria for the reasoning of noise pollution and related burdens while taking into account an assessment of individual and general mobility goals.

#### **Medicine**

Reflections on the study of dose-effect ratios, threshold values and other data with relevance to pathological, physical and psychological noise responses may suggest possible measures in the fields of technology, economy, urban planning and legislative.

#### **Sociology**

The analysis of the factual noise acceptances on various local and regional levels as well as their comparison might explain the subjective perspective on noise. The phenomenon of the so-called magnet-repellent function of certain noisy infrastructures, like airports or railway stations, reflect differences in noise perception and related behaviour of the pub-

lic in a nutshell. Corresponding knowledge will add to the above mentioned "objective" consequences of noise.

### **Technology/Urban planning**

The analysis of technological potentials and environmental management measures for the mitigation of noise and its impacts may help to find appropriate strategies to reduce the adverse effects of noise, both concerning noise emitting sources as well as the level of noise immission. This work package will also require a critical review of the procedures for measuring and modelling noise in order to enable its reliable prediction.

### **Economy**

Noise and its impacts will have consequences for health as well as for the stability of house and rent prices. These changes could be expressed in terms of costs caused by noise, which again could be compared to the costs of noise mitigation. Corresponding cost-benefit considerations may indicate the willingness of society to pay for the reduction of noise.

### **Jurisprudence**

A review of national, legal measures and instruments should be directed to the norm confirmation and adjustment on the European level with respect to the relevant EU-Directives. The consideration of universal valid values and procedures would therefore aim best at international coherence and comparability. However, the different noise sensitivities and effects on health of the public have to be considered, too. Corresponding normative differentiations will have to pay special attention to susceptible population groups and areas, among others. Finally, residual conflicts between individual and public interests have to be evaluated with respect to this topic.

The appropriate interdisciplinary integration of these questions concerning the problem of traffic noise is directed towards proposals and recommendations for the relevant actors on the national and European level.

#### *1.8.3 Work Plan*

The a.m. topic and some of its questions were discussed on the occasion of an international workshop on "Environmental Noise" in December 2002, which was organised and published by the Europäische Akademie. Its results contributed to the constitution of an interdisciplinary core group and to the formulation of a work programme. The work programme was approved by the Scientific Advisory Board of the Europäische Akademie in autumn 2003 and specified after the consolidation of the project group.

Meanwhile, the project group finalized most of the critical stocktaking from the relevant disciplines. The project group gained additional insights

from three expertises given by Professor Dr.-Ing. Markus Hecht (TU Berlin), Dr. Henk Miedema (TNO Delft) and Heinz Steven (TÜV Essen).

The upcoming spring symposium of the Europäische Akademie on 28 – 30 April 2005 will be dedicated to the noise issue with the topic "Living with Noise („Leben mit Lärm?)", thus giving the chance to discuss preliminary results as well as further questions on this issue with a broader audience. The project group plans to continue its scientific work until the end of 2005, when it will present its final results.

#### *1.8.4 Results*

J. Guerra González (ed.) Environmental Noise: Main Focus: Aircraft Noise. Graue Reihe 36, Europäische Akademie, Bad Neuenahr-Ahrweiler

The final report will be published as volume of the Springer book series „Wissenschaftsethik und Technikfolgenbeurteilung"

#### *1.8.5 Project Members*

*Chair: Professor Dr. Michael Kloepfer*

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*Professor Dr. Andrzej M. Kaniowski*

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*Professor Klepper, Ph.D.*

Institut für Weltwirtschaft, Kiel

*Professor Dr.-Ing. Gerhard Steinebach*

Technische Universität Kaiserslautern, Lehrstuhl Stadtplanung

*Professor Dr. Heinrich B. Weyer*

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## **1.9 European Social Policy**

### *1.9.1 Background and Task*

#### **1.9.1.1 Background**

Due to the enlargement of the European Union through the inclusion of new member states, the needs of coordination and eventually harmonization of the institutions and measures of social policy between the mem-

ber 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 in 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 coordination 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 the perspective of needs and the opportunities for political action.

National economic systems differ in regard to their level of economic development and their capacity of financing social or welfare standards but even more in regard to the institutional organization of the social systems, with different distributions of competencies between the main actors: state, market, society and individuals, and different priorities in the basic goal settings as well. Since these heterogeneous systems coexist in the context of the European Union, where international individual migration and workforce mobility within the common market 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 of treatment has to be guaranteed. 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. 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.

### 1.9.1.2 Tasks

The project starts with a short overview over the main challenges that the various European social systems face at the moment, which are the changes in the demographic structure, the tensions in the employment situation, the changing and the rise of new family patterns, the narrowing of financial restraints for measures of social policy especially in the health and pension area but also for the systems of poverty prevention, the polarization between regions with different economic development, the ongoing internationalization and globalization with their effects in terms of growing diversity and multiethnicity as well as stronger competition between different welfare regimes. Parallel to this overview, a short description of the traditional goals and instruments of the social systems elucidates in which ways, how successfully and with which effects social policy coped with these and similar problems in the past. A special focus

in this regard is put on the development of the goals of social policy in the different welfare regimes, i.e. the liberal, the social-democratic, the corporatist, the southern European, and the heterogeneous regimes of the middle-European transition countries as well as the relationships between these goals and priorities in other political areas, above all the economic and fiscal policy.

The overview of present challenges and current goals is then to be contrasted with the paradigm of the enabling welfare state which by combining the capabilities approach with the life course perspective states the fundamental goal of social policies, as to enable people to achieve the functioning they have reason to value, to invest in their capabilities, to maintain or raise their human and social capital, and to prevent their capabilities from becoming obsolete or redundant during their life span. On the one hand, based on this postulated paradigm, of the enabling or activating society the feasible goals and tasks of social policies on national and supranational level in the main areas of social policy have to be worked out. On the other hand, the ethical foundations for this approach have also to be established, especially in regard to the relationship between personal autonomy and social inclusion, between the individual and the community, but also in regard to the underlying concepts and principles of justice and the balance between universalization and contextualization of the corresponding requirements.

The formulation and the justification of the goals of social policy alone do not answer the question as to the appropriate level of implementation. A possible genuine European social policy has to be distinguished from the many social policies of the single member states in the European Union and their coordination. The European Union has drastically changed the framework conditions that influence national policies, mainly by the single market and mobility of labour, the common currency, the stability and growth pact – with its restraining effects on public financing, the regional, structural and employment policy at Union level, and the fundamental freedoms of the treaty – with all their legal consequences. However, the EU not only exerts an indirect influence on national social policies but – regardless of the principle of subsidiarity in the social area – it exercises some direct influence as well: through the Open Method of Coordination, by organized interest groups at Union level and, above all, through the jurisdiction of the European Court of Justice. In this regard, it has to be determined to what extent a European social policy already exists and to what degree and in what form its enlargement would be desirable and justifiable.

Following the three issues outlined so far, i.e. the differences between the welfare regimes, the paradigm of the enabling welfare state, the relationship between the national and the supranational level, four main areas of social policy will be analysed, focusing on two countries at a time, representing different welfare models: health (Great Britain/ Germany), family

(Finland/Estonia), old age (Poland/Germany) and poverty (Denmark/Belgium). For each policy area the differences and communities of the systems will be outlined, the options and hindrances of reciprocal learning and adaptation towards a common solution will be depicted, the elements compatible with an enabling welfare state will be elucidated and the actual and potential influence of the Union will be shown. Recommendations will be given as to how to implement policy measures at Union level, whether towards more or less coordination and harmonization or more diversity and competition, towards more state or more market.

Based on the results elaborated in the three areas, the need and the potential for reforms and innovations of the social policy at national and Union level shall be evaluated. The orientation towards the enabling society shall be concretized and its feasibility shown at least in principle. The relation between the two levels of policy shall be redefined and the significance of the principle of subsidiarity newly determined. In broad terms, the best suited instruments as well as the possibilities for the development of new means and methods for the implementation of a European social policy shall be illustrated, including the necessary institutions for the processes of consensus-building and democratic legitimization. The ultimate objective of the project is to give recommendations for the solution of these questions.

### *1.9.2 Working Procedure*

#### *1.9.2.1 Working Method*

The working method of the project group is based 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 establishment of the actual project group during the first meetings, the contents of the project theme receive 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 seeding texts 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 shall scientifically present, explain and justify their disciplinary perspectives in discussion with the other disciplines with the aim to produce interdisciplinary and trans-subjective results that can be compiled in a text which can be not only signed but also supported by all group members in collective authorship.

In order to give the group the opportunity to obtain an evaluation of the work in progress from external experts in form of their advice, critique and comments, two meetings will be held during the project at which experts from the same disciplines as the project members and possibly from other relevant fields shall be invited to discuss the intermediate results with the members of the project group. 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.

After the conclusion of the work within the project group and following the approval by the Scientific Advisory Board of the Europäische Akademie, the results of the project will be published and presented to the relevant target groups in the academic community as well as amongst the relevant political actors and representatives of the pertinent social institutions. The presentation 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 examine 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.

### 1.9.2.2 Programme and Time Frame

The time frame of the project is divided into two project phases, preceded by a preparatory-phase. During the preparatory phase, which started in 2002 with a core group and consisted of five meetings, the complete project group was constituted and a first paper elaborated for the Kick-off Meeting. By then the group members were:

*Professor Dr. Bernd Baron von Maydell* (chair)  
formerly Max-Planck-Institut für ausländisches und internationales Sozialrecht, München

*Professor Dr. Thomas Abel*  
Institut für Sozial- und Präventivmedizin, Universität Bern

*Professor Dr. Jos Berghman*  
Faculteit Sociale Wetenschappen, Katholieke Universiteit Leuven

*Professor Dr. Weyma Lübke*  
Institut für Philosophie, Universität Leipzig

*Professor Pirkko-Liisa Rauhalo, Ph.D.*

Department of Social Policy and Social Work, University of Helsinki /  
University of Tartu

*Professor Dr. Maciej Zukowski*

Akademia Ekonomiczna w Poznaniu, Poznan

With the Kick-off Meeting, held on 10-11 March 2003, the first main phase of the project was started. It served the purpose of discussing the basic structure and core questions of the project with external reviewers. The main topics of the meeting were the conceptual definition of a European Social Policy, the survey of the present welfare models and the tendencies in their developments, the relationship between national and supranational policies, and the ethical aspects of social policies in Europe. The reviewers were:

*Professor Dr. Klaus-Dirk Henke*

Institut für Volkswirtschaftslehre und Wirtschaftsrecht, Technische  
Universität, Berlin

*Professor Dr. Stephan Leibfried*

Zentrum für Sozialpolitik, Universität Bremen

*Professor Dr. Franz Marhold*

Institut für Arbeitsrecht und Sozialrecht, Karl-Franzens-Universität Graz

*Professor Dr. Ruud Muffels*

Faculty of Social and Behavioural Sciences, Tilburg University

*Professor Dr. Kieke Okma*

School of Public Policy Studies, Queen's University, Kingston

During the first main phase, comprising another six meetings, the initial structure of the contents of the book was defined and the main topics assigned to the group members for elaboration. Thereupon, seeding texts were prepared and presented at the meetings for further discussion and co-ordination within the framework of the structure of contents.

Due to changes in the composition of the group, some basic reorientations and a few minor shifts in the priorities of the contents had to be made. During the first main phase Jos Berghman, Weyma Lübbe and Thomas Abel left the group, while Ruud Muffels, Gert Verschraegen, Klaus-Dirk Henke and Michael Quante joined in. Through the work on the papers and the ongoing discussions towards the end of the first phase, two issues turned out to be critical: on the one hand, the goals of social welfare systems in regard to their historical development and their connection with economic goals as well as in respect to their orientation towards the paradigm of the enabling welfare state in conjunction with the capabilities approach and the life course perspective, on the other hand, the problem of the convergence or divergence of the different social models in the EU and the possible influence the Union can or should exert on these processes. Hence, the group decided to put these

two issues on the agenda of the Mid-term Meeting for an in-depth analysis with external reviewers.

With the Mid-term Meeting on 7-8 June 2004, the second main phase of the project was started. The reviewers were:

*Professor Dr. Beatrix Karl*

Institut für Arbeits- und Sozialrecht, Universität Graz

*Professor Dr. Stephan Leibfried*

Zentrum für Sozialpolitik, Universität Bremen

*Professor Lutz Leisering, Ph.D.*

Fakultät für Soziologie, Universität Bielefeld

*Professor Dr. Paul Schoukens*

Afdeling arbeids- en sociale zekerheidsrecht, Kath. Universiteit Leuven

*Professor Dr. Ulrich Steinvorth*

Philosophisches Seminar, Universität Hamburg

*Dr. Werner Tegtmeier, Staatssekretär a.D.*

Sankt Augustin

After the Mid-term Meeting, three meetings took place, in which, based on the results of the second review process, the table of contents was consolidated and the contributions of the group members revised and further integrated. By now the group still hasn't reached a final and definitive consensus on the recommendations for political actions especially in respect to the most appropriate instruments for a social policy at Union level, although in regard to the goals and ethical foundations, a consensus has been achieved.

Another four meetings are planned until the end of March 2005. Within this time span the conclusion of the project work and the presentation of the final text should be reached. The publication and presentation of the book are planned for the late summer/early fall 2005.

### *1.9.3 Members of the Project Group*

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*Professor Dr. Michael Quante*

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## 2. Studies

### 2.1 Reasoning Goals of Climate Protection. Specification of Art. 2 UNFCCC (completed)

#### 2.1.1 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 UNFCCC, which – as a consequence – foresees the stabilization of atmospheric greenhouse gas concentrations in the long-term.

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 most recent ratification of the Kyoto-Protocol by the Russian Federation will now give way for the Protocol's enforcement and its further development towards the a.m. stabilization goal, thus urging for respective clarifications.

The study was aimed at working out a reasonable and policy-compatible methodology to formulate and propose acceptable goals of international climate protection. This objective was achieved by stocktaking and the evaluation of relevant, contemporary, ethical theories, principles of environmental management and risk assessment as well as by critical analysis of the meaning and normative status of endangered environmental goods. The results were assessed in terms of economical trade-offs and technological potentials, respectively, as well as weighed according to a

set of relevant principles, criteria and priority rules. Finally, framing conditions from the recent political situation and choices for international conflict management were reflected in order to strengthen the practical relevance of the effort.

The research was conducted on behalf of the Federal Environmental Agency of Germany (Umweltbundesamt, UBA), Berlin. The project is registered as no. 202 41 252 at UBA.

### *2.1.2 Working Progress*

In early 2002 the Europäische Akademie applied successfully for a 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". The presentation of a pre-phase study on "Klimavorhersage und Klimavorsorge" on 6 Mai 2002 in Berlin gave the kick-off for this follow-on study on the climate issue, thus relying 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 reformulation of raw-texts to be implemented later-on and according to an extended outline. Beforehand, this outline had to be approved by the responsible advisory representatives of the supporting UBA (Petra Mahrenholz, Martin Weiß). An expertise of Professor Dr. Meinhard Schröder (Universität Trier) on the legal status of the UN-Climate Convention's ultimate objective contributed to the efforts of the working group. In late 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 the responsible representatives of the UBA and its superior, the German Federal Environmental Ministry (BMU) (P. Mahrenholz and Dr. H. Kohl, respectively).

In December 2002, a preliminary and yet incomplete report was commented by experts from outside the group. Corresponding advice was given by Professor Dr. A. Grunwald (Forschungszentrum Karlsruhe), Dr. G. Hanekamp (Europäische Akademie), Professor Dr. C. Lumer (University of Firenze), P. Mahrenholz (UBA, Berlin), Dr. B. Müller (Oxford Institute for Energy Studies) and Dr. S. Oberthür (ECOLOGIC e.V., Berlin). After completion of work, a final draft was prepared for evaluation by UBA-experts. In early 2004, the final report was submitted to the customer of the study, who made use of the results, immediately, by relevant consultations on

the European level. The whole effort was published, both in German and in English as volumes of the respective publication series of the Europäische Akademie and the UBA, which may be downloaded from either homepage (see 3.1.4). Finally, on 23 September 2004, the study results were presented at the German Foreign Office (Berlin) to around 40 experts from academia, industry and politics as well as from non-governmental organizations.

### 2.1.3 Results

The stabilization goal of the UNFCCC can be achieved by mitigation, adaptation or by both. Adaptation may be necessary due to the time-delayed impacts of historical emissions. As adaptation proposals are associated with many uncertainties, proponents of those strategies should be willing to shoulder the burden of proving their feasibility. Decision-makers will have to decide *which mix of mitigation and adaptations* to pursue – keeping in mind that mitigation has largely global effects, whereas the benefits of adaptation can be reaped more exclusively by those, who invested into such policies.

*Technological options* for mitigation are of particular relevance to infrastructure awaiting retirement in the near future. The next decades will be most decisive for determining whether lower vs. higher stabilization trajectories can be achieved. Above all, the development and utilization of *energy saving potentials* in different sectors is expected – esp. in the short-term – to enable significant mitigation of fossil fuel needs and related emissions worldwide.

The stabilization goal for limiting concentrations of greenhouse gases at a "safe" level is augmented by *three additional constraints*. There is a strong interrelationship between these constraints, which may lead to *trade-offs* between (a) ecosystems to be permitted to adapt naturally, (b) secured food production, and (3) sustainable economic development. Each of these three constraints can be assessed with respect to their spatial and inter-temporal scales, the uncertainties associated with them, as well as concerning the distributional effects associated with climate impacts and policies considered to limit such impacts. Policy-makers may impose restrictions on any of these trade-offs between the three constraints as well as among the aforementioned four categories used for the assessment of the three constraints. These *restrictions* limit the set of available policy options. Decision-makers will have to find operational ways to deal with questions as to which scale of regional and temporal disruptions are acceptable or how to bridge the distributional implications of unequal climate impacts. This may, for example, become evident concerning the question on which spatial scale food production has to be secured (local – regional – global?).

Above all, the *concept of a political goal* as expressed by the Art. 2 UNFCCC entails the requirement that *it should be specified* in its decisive parameters. Any refrain of certain Parties to the Convention to specifying in terms of quantities, time-frame or actors are inconsistent and should be thus rejected.

There is a strong ethical presumption against victimization and a universal moral obligation to refrain from causing injury – applicable to both present and future generations. Nevertheless, conflicting assumptions about the validity of comparative vs. absolute standards are decisive for the specification of long-term justice. The application of most ethical theories on global environmental risk assessment comes to the result to *better err on the side of caution*. If so, more safety-oriented criteria should be favoured. Therefore, the main approaches of environmental ethics *converge towards low stabilization levels* and clearly favour secure food supplies. The more ethical requirements are entailed in the constraints of Art. 2, the more the obligations tend towards low stabilization levels.

Nevertheless, different ethical approaches provide different grounds of how strict the "ecosystem-adaptation"-constraint should be interpreted. There are also different reasonable interpretations of the "sustainable development"-constraint according to different basic approaches in interpreting "sustainability". The respective measures depend on the approaches being chosen towards weak, intermediate or strong sustainability. The trade-offs between interpretations of the three requirements are to be considered, too: If the first two requirements of food security and nature conservation were interpreted more ambitiously, the concretisation of the third constraint of sustainable economic development may be weakened.

Moreover ethical *prescriptions in favour of different emission paths* are conceivable, which might be justified quite differently. In consideration of the plausible energy scenarios, which were published in 2000 by the "SRES-Report", an evaluation matrix for evaluation of possible future emission scenarios is proposed, which enables decision-makers to make reasonable and transparent choices on the basis of a set of relevant criteria and principles. Concluding from this exercise and considering the aforementioned convergence of ethical reasoning towards low stabilization levels, *the working group recommends to aim at scenario "B1", which resembles developments towards global decarbonisation* for sustainable development and equity improvement. Nevertheless, some other evaluations may be reasonable, too.

Political feasibility considerations give the following results: While German and European political actors are generally willing to publicly announce specific stabilization levels, many governments and political actors outside Europe have not yet publicly positioned themselves on Art. 2. Major developed countries (e.g., the USA) and nearly all developing

countries currently eschew to specify publicly their preferred stabilization goal. An exploratory questionnaire on the interpretation of Art. 2 indicates that Russia and the G77 plus China hold a transitional position in between the ambitious EU-attitude and a less motivated standpoint of the USA, on an average. The same principal ordering (EU - Russia and G77 plus China - USA) applies to the suggested timing *when to start to negotiate* Art. 2 UNFCCC questions. Only on *equity issues* associated with Art. 2, the G77 plus China give higher emphasis on its importance than the EU does. In terms of global coalition building for specifying Art. 2, the future *behaviour of the intermediate group* consisting of Russia as well as G77 plus China will determine whether or not a relatively ambitious goal on Art. 2 will be defined in time. Feasibility as well as acceptability considerations may lead to concluding statements for the political practice:

- The equity issue will strengthen the ethical interpretation of Art. 2 moral entailments. Therefore and according to the *ethical convergence* thesis the "intermediate group" together with the EU are expected to agree on early and ambitious acting, which would be favourable from a safety-oriented point of view, too.
- This will not exclude other parties. Proactive negotiators might recall that Art. 2 as a political goal entails the requirement that it *should be specified* in quantity and timeframe. So, all Parties to the Convention – incl. the USA – are urged to further the specification process.
- The evaluation of distributional effects would speak in favour of those long-term policies which pursue mixes of mitigation and adaptation with *emphasis on mitigative strategies*. Corresponding decisions will have to be made in time with regard to energy infrastructures awaiting retirement in the near future.
- The assessment of distributional effects may also tend to interpret the "food production"-constraint in terms of (local to regional) food security. This would have positive trade-offs for the "ecosystems"-constraint, too. Nevertheless, *the strict interpretation of both constraints may weaken the interpretation of the economic development constraint*. This trade-off might be – however – an obstacle for further negotiations.
- Concluding again, the working group proposes to the actors to *aim at the global decarbonisation scenario "B1"* of the SRES-Report.

### 2.1.4 Publications

#### Final Report (German/English):

Ott, K.; Klepper, G.; Lingner, S.; Schäfer, A.; Scheffran, J.; Sprinz, D. (2004) *Konkretisierungsstrategien für Art. 2 der UN-Klimarahmenkonvention*. Graue Reihe 37. Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler (<http://www.europaeische-akademie-aw.de>)

Ott, K.; Klepper, G.; Lingner, S.; Schäfer, A.; Scheffran, J.; Sprinz, D. (2004) *Reasoning Goals of Climate Protection – Specification of Art. 2 UNFCCC*. Climate Change 01/04. Umweltbundesamt, Berlin (<http://www.umweltbundesamt.de/klimaschutz/ufo.htm>)

Focused Summary:

Lingner, S. (2004) On the staircase to heaven? Towards the specification of the stabilization goal of the UN Climate Convention. Newsletter 51 (November 2004), Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler (<http://www.europaeische-akademie-aw.de>)

### 2.1.5 Working Group Members

*Dr. Stephan Lingner (coordination)*

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*Professor Gernot Klepper, Ph. D.*

Institut für Weltwirtschaft, Kiel

*Professor Dr. Konrad Ott*

Universität Greifswald, Professur für Umweltethik

*Achim Schäfer (research assistance)*

DUENE e.V., Greifswald

*Dr. Jürgen Scheffran (research assistance)*

Potsdam Institut für Klimafolgenforschung

*Detlef Sprinz, Ph. D.*

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UBA-project representative:

*Petra Mahrenholz (Berlin)*

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Duration: 05/02 – 05/03

## 2.2 Miniaturization and new Materials

### 2.2.1 Background and Task

The potential of Nanotechnology 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, nowadays, one often finds 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. Also in the view of many noted scientists, 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 phenomena 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 focused on Nanotechnology in its 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 matrix mentioned above by discussing it with leading international experts of Nanotechnology research. For this purpose, an expert meeting was organised and took place in parallel with the international Nanoscience & Technology Conference in Groningen, The Netherlands (18 -21 May 2003).

The project goes back to the earlier “New Materials” project of the Europäische Akademie published 1999. The project started in Juli 2002 and ended in June 2003.

### *2.2.2 Working Group Members*

The following experts are members of the core group:

Chair: *Professor Dr. Günter Schmid*

Institut für Anorganische Chemie, Universität Duisburg-Essen

*Professor Dr. Holger Ernst*

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*Professor Dr. Ulrich Simon*  
Institut für Anorganische Chemie, RWTH Aachen

Contact: Dr. Michael Decker

Duration: 7/02 – 6/03

### **3. 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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## **IV Scientific Communication and Cooperation**

### **1. Academy Conferences**

#### **1.1 Spring Conference 2003**

##### **Bioethics in a Small World**

10. – 12.4.2003, Bad Neuenahr

The conference was centred on bioethical problems of globalisation, whereby methodological questions as well as practical problems were discussed. The scientific conference began with the topic, "Bioethics as a Science and its Application in Politics", which included a debate on the difficulties involved in providing advisory services for political decision-makers in the field of bioethics. In the view of Udo Schüklenk, Johannesburg, bioethical research is being increasingly hampered by interest groups, such as the pharmaceutical industry. Schüklenk's suspicion regarding a structurally inherent vulnerability to corruption on the part of bioethical research was vehemently disputed by many participants in the discussion, among others, also by the talk given by Edgar Morscher, Salzburg. With regard to the question as to whether basic bioethical principles (such as the principle of "informed consent") could claim culturally invariant validity, the Berlin cultural philosopher, Oswald Schwemmer, expressed scepticism, since, in his view, the validity of moral convictions was only possible against the background of common, historical experience. Representatives of the developing countries insisted, first and foremost, upon the universal validity of human rights, but they also pointed out, on the other hand, the right to cultural identity in the assessment of options for action in the medical field. The discussion showed that, on the question of the cross-cultural validity of basic rules in bioethics and thus, for example, the possibility of global conventions, there still exists a considerable need for clarification.

Professor Carmel Shalev, Tel Aviv, Dr. Georg Marckmann, Tübingen, Nathan Ford, London, Dr. Richard Ashcroft, London, conducted a discussion on the subject of "The Provision of Medicines in Developing Countries". For one thing, medicines protected by patents are frequently unaffordable for the people living in these countries. For another thing, there are diseases from which primarily these very people suffer but they have insufficient money available to support the demand and cover the costs for the development of the medicine needed. Apart from the problems involved in providing these medicines at acceptable prices, or indeed in developing them at all, the issue was addressed as to which actors should be held responsible (states, pharmaceutical enterprises) to eliminate these deficiencies.

The speakers were: Dr. Richard E. Ashcroft (Imperial College, London), Professor Dr. Abdallah S. Daar (University of Toronto), Nathan Ford (Médecins Sans Frontières, London), Professor Dr. Michiel Korthals (Wageningen University and Research Centre), Dr. Georg Marckmann (Tübingen University), Professor Dr. Edgar Morscher (Salzburg University), Dr. Bronwyn Parry (King's College, Cambridge), Professor Dr. Udo Schüklenk (University of the Witwatersrand), Professor Dr. Oswald Schwemmer (Humboldt-Universität zu Berlin), Dr. Carmel Shalev (Gertner Institute, Tel Hashomer), Professor Dr. Dr. h.c. Joseph Straus (Max-Planck-Institute for Intellectual Property, Competition and Tax Law, Munich), Professor Dr. Godfrey B. Tangwa (University of Yaounde).

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## 1.2 Autumn Conference 2003

### **Human Nature and the Sciences. Current Challenges in a Franco-German Perspective**

17. – 19.9.2003, Engers, Neuwied

Scientists from France and Germany discussed the subject, "Human Nature and the Sciences. Current Challenges from a Franco-German Perspective" in three Sections, covering the significance of developments in the neuro-sciences, genetics and medicine for our image of man and the human condition.

The conference was opened by a talk held by the neuro-biologist, Professor Dr. Michel Imbert (École Normale Supérieure Paris) on the modern image forming procedures of the neurosciences. By this method it is also possible to examine moral attitudes and modes of behaviour. A discussion is said to be developing on the manner in which the neurosciences are applying moral concepts – such as the concept of "forming moral judgement", "free will", among a number of others, for example.

Problems involved in physician assisted suicide were discussed by the philosophers, Professor Dr. Paula La Marne, (Université Paris VI), and Professor Dr. Michael Quante (Universität Duisburg-Essen). Whilst La Marne supported the view that the extension of the provision of palliative medicine could make the legalisation of physician assisted suicide superfluous, Quante was of the opinion that even the principally desirable increased use of palliative medicine could not do away with all wishes in regard to active physician assisted suicide. Furthermore, Quante argued, considerations weighing the quality of life of a human being did not necessarily have to violate the dignity of the person concerned and that therefore, the evaluation of the quality of life of the dying person might enter into decisions in the final phase of life.

In a further Section, the geneticist, Professor Dr. Arnold Munnich, (Université Paris V) together with the philosophers, Professor Dr. Dr. h.c. Carl Friedrich Gethmann, (Europäische Akademie), and Professor Dr. Claude Debru (École Normale Supérieure Paris), discussed the medical and moral problems involved in a targeted, human intervention into the genome of an individual, thus indirectly intervening with evolution. The predominant stance on this subject was that, within certain limits, action of this kind was morally permissible or even advisable.

The conference showed that there are considerable differences between the medico-ethical convictions and methods in the traditional French and German ways of thinking. With a view to the necessary legal harmonisation in Europe, the Europäische Akademie intends to continue conducting conferences of this kind in the future. The results of the conference will be published by the conference organisers.

The speakers were: Professor Dr. Michel Imbert (École Normale Supérieure Paris), Professor Dr. Paula La Marne, (Université Paris VI), Professor Dr. Michael Quante (Universität Duisburg-Essen), Professor Dr. Arnold Munnich (Université Paris V) Professor Dr. Dr. h.c. Carl Friedrich Gethmann (Europäische Akademie), Professor Dr. Claude Debru (École Normale Supérieure Paris).

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### 1.3 Spring Conference 2004

#### The Interdisciplinary Function of Philosophy

31.3. – 2.4.2003, Bad Neuenahr

The Spring Conference 2004 undertook a critical reflection on the circumstance that philosophy in the present day – as already in past epochs – makes a contribution to answering central questions on scientific and technical culture, and this both with respect to fundamental problems (such as the reliability and understandability of various forms of knowledge, the meaning of concepts or the acceptability of regulations) as well as essential, individual questions (such as the moral status of the embryo, the social compatibility of energy systems or the question of responsibility for future generations). An indication of this role of philosophy is the circumstance that since the founding of the Europäische Akademie, there has always been at least one philosopher involved in its interdisciplinary projects. The conference took this development into account and thereby conducted a critical reflection on both the interdisciplinary function of philosophy as well as on the discussion regarding the conceptions of interdisciplinarity.

The conference was opened by a talk given by the Director of the Europäische Akademie, Professor Dr. Dr.hc. Carl Friedrich Gethmann, on the subject "The Everyday Reality of Interdisciplinary Research". Gethmann focused particularly on questions of the interdisciplinary competence of scientists, the institutionalisation of interdisciplinary projects and the relationship between science and society in the framework of providing advice for decision-making in the political field. The importance of "Medical Ethics for the Medical Sciences" was examined in the talk given by Professor Dr. Dieter Birnbacher (Universität Düsseldorf) in the framework of the first Section, "The Interdisciplinary Function of Ethics". Birnbacher, by means of an ethical examination of the status of the embryo in the pertinent German legislation (Abortion Act, Embryo Protection Act and the law governing the use of human embryonic stem cells) showed that the factual moral basis determining said legislation is incoherent. In the second talk in this Section, the law philosopher and penologist, Professor Dr. Reinhard Merkel (Universität Hamburg) dealt with the latest results of the neuro-sciences in the field of free will and their impact on the concepts of punishment and blame. Merkel set out to show that penal law was unable to dispense with the presumption that the delinquent could have acted differently from the way he did act. However, he recognized considerable difficulties in attaining a consistent reconciliation between the results of the natural sciences and the demands made on the law by society at large.

The second Section of the conference dealt with the interdisciplinary function of scientific theory. In interdisciplinary research, scientific theory has the task to clarify the methodological criteria for scientific work and, in connection with this, the meaning of the basic concept of the sciences. For Professor Dr. Peter Janich (Universität Marburg), the self-understanding of natural scientists differs from what they actually do as scientists. According to Professor Janich the simple conclusion that the scope of the methods applied in the natural sciences ultimately determines the scope of the sciences as a whole was founded upon a misconception. The fact that all things may be described scientifically did not mean to say that this description was exhaustive. Janich propagates, as a counter-model, a theory of aspects, going back to Aristoteles, according to which natural and artificial aspects complement one-another and may be described in accordance with the respective, specific methods. Professor Dr. Armin Grunwald (Universität Freiburg, Institute for Technology Assessment and Systems Analysis in the Karlsruhe Research Centre and Head of the Office for Technology Assessment of the German Federal Parliament) criticised that so far not enough work had been done in the field of scientific theory in respect of interdisciplinary research. This deficiency, it was claimed, was due to a lack of reliable quality control in regard to interdisciplinary work. In order to eliminate this deficit, the first step should be to describe, by way of a "topology of argument chains", the

path from disciplinary results towards interdisciplinary recommendations for action. The difficulties involved in individual cases were demonstrated by Grunwald with an example from the discussion on sustainability. Professor Dr. Rainer Hegselmann (Universität Bayreuth) presented examples of modelling for reaching consensus in the case of limited confidence. He demonstrated that many models of human interaction, under the aspect of confidence in the interactive partner, converged in an astonishingly stable manner towards consensus. Hegselmann was thus able to show that philosophically founded, computer aided models can offer a contribution to the solution of socio-scientific problems.

In its final meeting, "Philosophy and Political Counseling", the conference turned to the practical, political relevance of philosophical work. Professor Dr. Nida-Rümelin (Geschwister Scholl Institut für Politische Wissenschaft, Universität München) opened the Section with the question, "Does the Political System need Advice from Philosophy?", and came to the conclusion that many philosophical models for providing advice had "not passed the practical test". As a counter-model he suggested a holistic, coherence model, which linked in with fundamental, life-world, moral institutions of the citizens. In his talk on Ethics in Commissions Professor Dr. Gerhard (Humboldt-Universität zu Berlin) dealt with the seeming contradiction between the insupportable character of the categorical appeal of morals vis-à-vis the individual and the latter's work in commissions, such as the Ethics Commission which, he said, was characterised by negotiation and compromise. Gerhard launched a plea for an honest, scientific stance on the part of commission members, both in the interests of the matters on hand as well as in their own well-understood self-interest. The chairman of the Commission on Basic Values (Grundwertekommission) of the Christian Democratic Party (CDU), Dr. Christoph Böhr (MdL, Mainz), had been invited by the organisers of the conference as one of the few politically active doctors of philosophy. In his talk, he criticised the lack of political goal-orientation and incremental action which, he said, contributed to provoking the failure of necessary reform projects. "The Significance of Philosophy in Day-to-day Business" now lay in the finding of coherent, overriding aims that would justify efforts towards reform, with a view to contributing towards a politically motivated provision for the future. This also included philosophically founded work in creating a modern image of man and society. Therefore, against this background, he concluded, there was a need for philosophy on the part of politics.

The contributions made at the conference will be published in the book series, "Ethics of Science and Technology Assessment" of the Europäische Akademie.

The speakers were: Professor Dr. Dr. h.c. Carl Friedrich Gethmann (Europäische Akademie), Professor Dr. Dr. h.c. mult. Jürgen Mittelstraß (Universität Konstanz), Professor Dr. Dieter Birnbacher (Universität Düsseldorf), Professor Dr. Reinhard Merkel (Universität Hamburg), Professor Dr. Peter

Janich (Universität Marburg), Professor Dr. Armin Grunwald (Universität Freiburg, Institute for Technology Assessment and Systems Analysis in the Karlsruhe Research Centre and Head of the Office for Technology Assessment of the German Federal Parliament), Professor Dr. Rainer Hegselmann (Universität Bayreuth), Professor Dr. Julian Nida-Rümelin (Geschwister Scholl Institut für Politische Wissenschaft, Universität München), Professor Dr. Volker Gerhardt (Humboldt-Universität zu Berlin), Dr. Christoph Böhr (MdL, Mainz).

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#### 1.4 Autumn Conference 2004

##### **Bioethics in Germany and Poland. Tradition and Controversies**

26. – 28. September 2004, Łódź, Poland

The autumn conference, "Bioethics in Germany and Poland. Tradition and Controversies" was conducted as a joint conference of the Europäische Akademie and the Chair of Ethics of the University of Łódź in Poland which hosted the conference from 26 to 28 September 2004. In his capacity as the prorector of the University of Łódź Professor Dr. Piotr Daranowski stated, during the opening ceremony, that this conference was held to support recreating a traditional region of European research and to afresh the discourse between German and Polish scientists which together with the discourse with Jewish and Russian scientists has a long tradition in Łódź. In four sessions and a panel discussion scientists from Austria, Germany, France and Poland discussed about the different roles academic and practical bioethic should have especially in Poland and about the following selected bioethical topics:

The first session about "Euthanasia" was opened with a lecture by Professor Dr. Dieter Birnbacher, Universität Düsseldorf, who pointed out under which circumstances terminal sedation can be classified as euthanasia and that in these cases the patients' consent has to be ensured. Professor Dr. Jacek Hołowka, Warsaw University, analysed arguments typically used by defenders of natural death and defenders of voluntary death. He called into question, if mercy killing has always to be judged worse than assisted death. In the next session about "The right to live - The right to die" Professor Dr. Barbara Chyrowicz, Catholic University of Lublin, argued that in situations of moral uncertainty alternatives in which we are morally certain should be favoured. Thereafter, Dr. Heinrich Ganthaler, Universität Salzburg, presented a logical analysis of the two different positions: the qualified doctrine of sanctity of life and the strong and weak liberal view. In the third session about the „Ethical problems of medicine“ Professor Dr. Alicja Przyłuska-Fischer, Warsaw University, reviewed the debate on embry-

onic stem-cells in Poland and stated how bioethic research should position itself in such discourses. Afterwards the biologist Dr. Margret Engelhard, Europäische Akademie Bad Neuenahr-Ahrweiler, presented a novel technique of drug production that is referred to as „Pharming“ and proposed an ethical debate on this topic. In the last session Professor Dr. Michael Quante, Universität Duisburg-Essen, and Professor Dr. Piotr Morciniec, University of Oppeln, debated on the problem of „Incentives for organ donation“. Quante ruled out general conceptual arguments for and against incentives for organ donation, but opposed to the introduction of incentives for organ donation, since this would add the logic of trading to the Personen-Leib-relation which might harm it and should not be given up without urge. Morciniec argued that incentives for organ donation would – as in prostitution – immorally instrumentalize the body, might lead to crawling out effects in post mortal organ donation and could discriminate low educated and poor parts of the population.

This conference has revealed the increasing strength of bioethic research in Poland and the value such intercommunications can bring about for bioethic research in Europe.

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## 2. Expert Meetings

### **Zukünftige Klimaänderungen als Herausforderung für die deutsche Wirtschaft (Future Climate Changes as a Challenge for the German Economy)**

24.2.2003

This expert meeting aimed at discussions on the recent innovation potential of different industrial sectors and trade branches with respect to perspectives for energy saving and emissions reductions. Both aspects were directed towards future options for cost effective and "climate-friendly" production of goods and services as well as towards corresponding necessary research. The results of this workshop had been published by C.F. Gethmann and S. Lingner as volume 34 of the academy's series "Graue Reihe". The outcome stimulated further programmatic progress of the BMBF, which resulted in a new ministerial initiative on "Forschung für den Klimaschutz und Schutz vor Klimawirkungen".

Participants: Dr. Norbert Binder (Bonn), Dr. Gerd Hanekamp (Bad Neuenahr-Ahrweiler), Professor Klepper, Ph.D. (Kiel), Dr. Jörg Rothermel (Frankfurt), Michael Rumberg (Köln), Peer Seipold (Hamburg), Dr. Gerhard Voss (Köln).

## **Pharmacogenomics**

20. – 21.3.2003

The expert meeting took place in Berlin, in cooperation with the Max-Delbrück-Centrum für Molekulare Medizin. The aim of the meeting was to sound out the state-of-the-art of research in the field of "Pharmacogenomics" and the scientific, legal and ethical problems involved in this connection.

In an initial section, fundamental issues regarding pharmacogenomic research as well as the chances of increasing the effectiveness of cytostatic therapy and/or the optimisation of psychiatric therapy by the application of pharmacogenomic research were dealt with. The topic of the second section covered the ethical implications of pharmacogenomic research and its application. The Estnic Gene-Screening Programme served as an example. With the question concerning the change in the conception of illness brought about by pharmacogenomic research, the consequences effecting the conceptuality of medical science were discussed. The economic aspect was reflected in questions concerning patent laws regarding gene typification. One problem for pharmaceutical research is posed by questions concerning patient enlightenment, which were determined by concrete research projects. All aspects mentioned so far should have a bearing upon health policy and influence decisions made in this field.

Participants: Professor Dr. I. Roots (Berlin), Professor Dr. M. Eichelbaum (Stuttgart), Professor Dr. F. Holsboer (München), Professor Dr. M. Sutrop (Tartu/Estland), Dr. D. Lanzerath (Bonn), Dr. St. Stürzebecher (Berlin), Dr. I. Härtel (Mainz ).

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

8. – 9.5.2003

In view of the new possibilities for neurological intervention, such as Deep-brain Stimulation in the treatment of neurological disorders like, for example, Parkinson's Disease, or the restoration of sensory functions by means of electronic implants as well as the possible influencing of brain functions by the use of cell and tissue implants, the participants of the expert meeting discussed the present European regulations and the anticipated perspectives offered by the new possibilities for interventions in the human brain. In addition to legal questions, decisive practical issues, such as reliable ways in which it is possible to determine the capability of the patient concerned to grant his consent, were discussed. In further contributions the question was posed as to when it was at all possible to speak of psychic illness. Furthermore, the role of science and the influence of valuations in regard to the assessment of psychic conditions

as well as the question in respect of human free will, raised by more recent neurological findings, were discussed.

Participants: Professor Dr. Hans-Werner Bothe, (Münster), Priv.-Doz. Dr. med. Steffen Rosahl (Hannover), Professor Dr. Otmar Wiestler (Bonn), Dr. Elaine Gadd (London), Professor Dr. Carlos Romeo Casabona (Bilbao), Professor Dr. Bill Fulford (Oxford), Professor Dr. Dr. Jochen Vollmann (Nürnberg), Priv.-Doz. Dr. Dirk Hartmann (Essen).

### **Nanotechnology Assessment**

19.5.2003

The study group "Miniaturization and new Materials" organised an expert meeting in Groningen (The Netherlands) on May 19, 2003. Invited experts were Professor Dr. Fraser Stoddart and Professor Dr. James K. Gimzewski (both from the University of California, Los Angeles). Both experts have been asked to present their comments on future applications of Nanotechnology, on the state of the art of Nanoscience and on the social consequences of Nanotechnology developments. Moreover they have been asked to reflect on US science policy aspects. In this respect Professor Stoddart reported about the new California Nanosystems Institute (CNSI) which should "act as catalyst to make California one of the hubs of Nanotechnology industry". Moreover he referred to problems occurring in the every day work of Nanoscientists due to the interdisciplinary collaboration. He recommended taking into account the training of capabilities to overcome these problems in the education of Nanoscientists. Professor Gimzewski argued referring to the social relevance of Nanotechnology that technology development can not be assessed without referring to cultural developments. He mentioned the new science-fiction book of Michael Crichton in which devices of Nanotechnology are described as dangerous developments. He underlined the influence of these books on the public opinion forming. In this respect he recommended to take upcoming society's unease facing Nanotechnology seriously in order to avoid a general rejection. The results of the expert meeting will be integrated in the forthcoming report of the study group.

### **Efficiency-Mindedness and Moral Obligation in the Health Service**

12. – 13.6.2003

The controversial discussions concerning the reform of the health service in Germany are characterised by a fundamental antagonism between efficiency-mindedness and moral claims, inferred from the normative implications of the physician-patient relationship. This situation in the discussion demands a more thorough reflection on the relationship between economic and ethical categories. In principle, namely, these are not necessarily in opposition to one another. For example, in certain contexts, it is absolutely legitimate to speak of a moral obligation towards

acting efficiently, while, on the other hand, efficient action strategies may well be marked by "wise" consideration of moral norms.

The expert meeting, conducted by the Europäische Akademie, together with the Medico-Philosophical Working Group of the Hagen General Hospital (Allgemeines Krankenhaus Hagen GmbH) and the Forum Philosophicum of the FernUniversität Hagen attempted to overcome the antagonistic face-off by highlighting the limited justification and complementary character of economic and ethical categories from the economic, juridical, medical and ethical points of view. Furthermore, conclusions were drawn for the normative foundation of a democratic health care service.

Participants: Dr. med. Dietmar Herberhold (Wetter), Priv.-Doz. Dr. Rainer Souchon (Hagen), Professor Dr. Hans-Heiner Raspe (Lübeck), Priv.-Doz. Dr. Dr. Nikola Biller-Adorno (Genf), Dr. Ullrich Freudenberg (Essen), Professor Dr. Martin Kolmar (Mainz), Professor Dr. Dr. h.c. Carl Friedrich Gethmann (Bad Neuenahr-Ahrweiler).

### Incentives for Organ Donation

3.12. - 4.12.2004

The transplantation act of 1997 brought about more legal certainty for transplantation medicine. However, the severe shortage of transplants remains unchanged and recent reports documented first cases of illegal organ donations within Europe, reflecting the actuality of this topic. Strategies and incentives to increase organ availability and thereby to improve this situation are increasingly discussed. In the course of this discussion, recently voices propagating a limited legalisation of trading organs arose.

An expert meeting conducted by the Europäische Akademie at the Berlin Brandenburgische Akademie der Wissenschaften (BBAW) in Berlin focussed on different aspects of the problem. The possibilities to expand live organ donation, the concept of altruism in organ donation and special aspects of kidney donation were discussed. Special emphasis was put on a moral analysis of a "market of organs" and the question if in live organ donation a person has the right to interfere with its own body, since persons do not own their Leib but they are their Leib. Furthermore, the concept of reciprocity versus the duty for organ donation, and the current insurance status for live organ donors was in the focus of discussion.

Participants: Professor Dr. Dr. M. Ahlert (Halle), Professor Dr. C. B. Blankart (Berlin), Professor Dr. F. Breyer (Konstanz), Professor Dr. W. van den Daele (Berlin), Dr. M. Engelhard (Bad Neuenahr-Ahrweiler), Professor W. Gaertner (Osnabrück) Professor Dr. Dr.hc C.F Gethmann (Bad Neuenahr-Ahrweiler), Professor Dr. A. Gethmann-Siefert (Hagen), Dr. med. Greif-Higer (Mainz), Professor Dr. G. Gubernatis (Hannover), Dipl.-Päd. U. Henkel (Bad Neuen-

ahr-Ahrweiler), Professor Dr. H. Kliemt (Duisburg), Professor Dr. Dr. C. Kopetzki (Wien), Professor Dr. W. Lübbe (Leipzig), Professor Dr. N. Paul (Mainz), RA U. Riedel (Berlin), Professor Dr. Ch. Rittner (Mainz), Professor Dr. H. J. Schlitt (Regensburg), Professor Dr. H.-L. Schreiber (Göttingen), Professor Dr. J. Taupitz (Mannheim), Professor Dr. G. Thiel (Basel), Dr. F. Thiele (Bad Neuenahr-Ahrweiler), S. Wille (Mannheim).

### 3. Publications

#### 3.1 Book Series „Wissenschaftsethik und Technikfolgenbeurteilung“ issued by Carl Friedrich Gethmann

Volume 19 E. Ehlers, C. F. Gethmann (eds) (2003) *Environment across Cultures*. Springer, Berlin/Heidelberg/New York

*Papers:*

R. P. Sieferle, J. Mittelstraß, M. Thompson, D. Gyawali, P. Claval, H. Coward, A. Michaels, H. Yoon, D. Birnbacher, K. Ott, M. Redclift, L. A. Duhaylungsod, B. Sinha, P. S. Ramakrishnan, K. G. Saxena, R. K. Maikhuri, C. F. Gethmann.

Volume 20 R. Chadwick, S. Henson, B. Moseley, G. Koenen, M. Liakopoulos, C. Midden, A. Palou, G. Rechkemmer, D. Schröder, A. von Wright (2003) *Functional Foods*. Springer, Berlin/Heidelberg/New York

Volume 21 D. Solter, D. Beyleveld, M. B. Friele, J. Holowka, H. Lilie, R. Lovell-Badge, C. Mandla, U. Martin, R. Pardo Avellaneda (2003) *Embryo Research in Pluralistic Europe*. Springer, Berlin/Heidelberg/New York

Volume 22 M. Decker, M. Ladikas (eds) (2004) *Bridges between Science, Society and Policy. Technology Assessment – Methods and Impacts*. Springer, Berlin/Heidelberg/New York

Volume 23 C. Streffer, H. Bolt, D. Follesdal, P. Hall, J. G. Hengstler, P. Jacob, D. Oughton, K. Prieß, E. Rehbinder, E. Swaton (2004) *Low Dose Exposures in the Environment. Dose-Effect Relations and Risk Evaluation*. Springer, Berlin/Heidelberg/New York

Volume 24 F. Thiele, R. Ashcroft (eds) (2004) *Bioethics in a Small World*. Springer, Berlin/Heidelberg/New York

*Papers:*

A. Schwemmer, G. Tangwa, M. Morthals, A. Daar, T. Acharya, I. Filate, H. Thornsteinsdottir, P. Singer, J. Straus, B. Parry, C. Shalev, G. Marckmann, E. Morscher, U. Schüklenk, J. Lott.

The following volumes (translations of volume 5 and 18) were also published at Springer:

C. Streffer, J. Bücken, A. Cansier, D. Cansier, C. F. Gethmann, R. Guderian, G. Hanekamp, D. Henschler, G. Pöch, E. Rehbinder, O. Renn, M. Slesina, K. Wuttke (2003) *Environmental Standards. Combined Exposures and Their Effect on Human Beings and Their Environment*. Springer, Berlin/Heidelberg/New York

U. Steger, W. Achterberg, K. Blok, H. Bode, W. Frenz, C. Gather, G. Hanekamp, D. Imboden, M. Jahnke, M. Kost, R. Kurz, H. G. Nutzinger, Th. Ziesemer (2004) *Sustainable Development and Innovation in the Energy Sector*

### 3.2 „Graue Reihe“

- No. 33 Ulrich Steger et al. *Sustainable Development and Innovation in the Energy Sector*. Executive Summary, 2/03
- No. 34 C.F. Gethmann, S. Lingner (Hrsg.) *Zukünftige Klimaänderungen als Herausforderung für die deutsche Wirtschaft*, 7/03
- No. 35 G. Schmid et al. *Small Dimensions and Material Properties. A Definition of Nanotechnology*, 11/03
- No. 36 J. Guerra González (ed) *Environmental Noise. Main Focus: Aircraft Noise*, 3/04
- No. 37 K. Ott et al. *Konkretisierungsstrategien für Art. 2 der UN-Klimarahmenkonvention*, 3/04

### 3.3 Topics of the Newsletters

- No. 36 Preimplantation Genetic Diagnostics, the Press and other Hazards, *Felix Tiele*
- No. 37 Ist unser Gesundheitssystem noch bezahlbar?, *Klaus-Dirk Henke*
- No. 38 The Crisis of the Ethos of Science, *Carl Friedrich Gethmann*
- No. 39 Tolerating Contamination by Natural Attenuation. Business as Usual or Legitimate Strategy?, *Stephan Lingner*
- No. 40 Financial Incentives for Organ Donors?, *Friedrich Breyer*
- No. 41 Definitions of Nanotechnology – Who needs them?, *Michael Decker*
- No. 42 Bürgerversicherung? Alle Mann an Bord des sinkenden Schiffs!, *Martin Kolmar*
- No. 43 All Knowledge is Orientational Knowledge, *Gerd Hanekamp*
- No. 44 Die Bürgerversicherung aus liberaler Sicht, *Friedrich Breyer*
- No. 45 Methodological Problems of Integrative Research, *Carl Friedrich Gethmann*

- No. 46      Mistress and Handmaiden. Scientific Policy Consulting between Science and Politics, *Felix Thiele*
- No. 47      Permissible Health Claims in the EU: Opportunities for Functional Foods, *Gerrit Koenen*
- No. 48      The Amphiboly of Illness, *Carl Friedrich Gethmann*
- No. 49      Business Ethics of Innovation, *Gerd Hanekamp*
- No. 50      Responsibility and Uncertainty, *Rupert Leitner*
- No. 51      On the Staircase to Heaven? Towards the Specification of the Stabilization Goal of the UN Climate Convention, *Stephan Lingner*

### 3.4 Journal POIESIS & PRAXIS

The Europäische Akademie Bad Neuenahr-Ahrweiler GmbH, in conjunction with Springer 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 technicalisation 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 (*Technikfolgenabschätzung. Theorie und Praxis*), are not conceived as specialist journals but serve to provide communication within TA networks and present activities in the field of institutions involved.

The 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 has been served by POIESIS & PRAXIS.

The journal POIESIS & PRAXIS is 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 are devoted to:

- (1) Research into the consequences of scientific, technological and bio-medical 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

Friele M B (2003) "Do Committees Ru(i)n the Biopolitical Culture? On the Democratic Legitimacy of Bioethics Committee", in: *Bioethics*, Vol. 17 No. 4, Special Issue: Consensus in Public Bioethics Commissions, 301–319

Gethmann C F (2003) „Wissen als Macht. Wissenschaftsphilosophische Überlegungen“, in: R. Emmermann u.a. (Hgg.), *An den Fronten der Forschung: Kosmos – Erde – Leben* (Verhandlungen der Gesellschaft

- Deutscher Naturforscher und Ärzte, 122. Versammlung, 21. – 24 September 2002, Halle/Saale), Stuttgart u.a., 238 – 245
- Gethmann C F (2003) „The Moral Status of the Embryo and the Protection of its Life“, in: *Human Reproduction and Genetic Ethics*, Nr. 2, 38 – 40
- Gethmann C F (2003) „Entwicklungen in der Frühphase aufgreifen“, Interview in: *Europäische Zeitung*, Juni, 95 – 97
- Gethmann C F (2003) „A Call for Multiclass Medicin“, Interview in: *living-bridges* 1/2003, 57
- Gethmann C F (2003) „Ethical Aspects of Technical Safety“, in: *Human Factors and Ergonomics in Manufacturing* 13, 1–10
- Gethmann C F (2003) (in cooperation with F. Thiele) „Grundlagen der ethischen Beurteilung der Gentechnik“, in: D. Ganten / R. Ruckpaul (eds) *Ethische Probleme der Molekularen Medizin. Grundlagen und Anwendungen*, Heidelberg u.a., 711 – 734
- Gethmann C F (2004) (with T. Sander) „Rechtfertigungsdiskurse“, in: H. Friesen / K. Berr (Hgg) *Angewandte Ethik im Spannungsfeld von Begründung und Anwendung*, Frankfurt a.M., 111 – 158
- Gethmann C F (2003) „The philosophical importance of limitative theories in logic and mathematics“, in: W. Hogebe (ed) *Grenzen und Grenzüberschreitungen*. XIX. Deutscher Kongress für Philosophie. Vorträge und Kolloquien, Berlin, 502 – 504
- Gethmann C F (2004) C.F. Gethmann, W. Gerok, H. Helmchen, K.-D. Henke, J. Mittelstraß, E. Schmidt-Aßmann, G. Stock, J. Taupitz, F. Thiele, *Gesundheit nach Maß? Eine transdisziplinäre Studie zu den Grundlagen eines dauerhaften Gesundheitssystems*, Berlin: Akademie Verlag
- Gethmann C F (2004) „Die Erfahrung der Handlungsurheberschaft und die Erkenntnisse der Neurowissenschaften“, in: Berlin-Brandenburgische Akademie der Wissenschaften (Hg.) *Zur Freiheit des Willens*. Streitgespräch in der Wissenschaftlichen Sitzung der Versammlung der Berlin-Brandenburgischen Akademie der Wissenschaften am 27. Juni 2003, Berlin, 45–61
- Gethmann C F (2004) „Ist das Wahre das Ganze? Methodologische Probleme Integrierter Forschung“, in: G. Wolters / A. Carrier (Hgg.) *Homo Sapiens und Homo Faber* (Festschrift für Jürgen Mittelstraß), Berlin 2004, 391– 404
- Gethmann C F (2004) „Memorandum zu den Grundlagen des Gesundheitssystems“, in: *circular* der Berlin Brandenburgischen Akademie der Wissenschaften 8 (2004) Heft 29, 15 f
- Gethmann C F (2004) „Gesundheit nach Maß? Eine transdisziplinäre Studie zu den Grundlagen eines dauerhaften Gesundheitssystems“, in: *brennpunkt-gesundheitswesen.de* (2004), Heft 8, 20 – 24

- Guerra González J (2004) "Prevention of the Xenogenic Infection Risk and the Spanish and German Constitutions", in: *Law an the Human Genome Review*, Fundación BBVA, Rev Der Gen H 20/2004 January-June, 123–146
- Guerra González J et al. (2004) „La responsabilité de la personne électronique", in : Cassuto, Thomas, *Les défis du vivant*, Présaje, Paris, 235–245
- Guerra González J (2004) "Animal cloning and the precautionary principle", in: Romeo Casabona, Carlos, *Transgénesis, clonación animal y xenotrasplante: aspectos éticos y jurídicos*, Comares (in print)
- Hanekamp G (2003) "Decision theoretic arguments as heuristics in environmental policy decisions." In: *Poiesis Et Praxis*, Vol. 1, Number 3, (published online: 20th November, 2002)
- Hanekamp G (2004) „Kulturalistische Unternehmensethik. Begründung und Anwendung", in: Friesen H, Berr K: *Angewandte Ethik im Spannungsfeld von Begründung und Anwendung*. Peter Lang, Frankfurt a.M., 257 – 273
- Lingner S (2003) (in cooperation with M. Decker) „Normative Implikationen und intergenerationelle Lernprozesse langfristigen Umwelthandelns", in: Gotthard Stein (Hrsg.): *Umwelt und Technik im Gleichklang. Technikfolgenforschung und Systemanalyse in Deutschland*. Springer-Verlag Berlin Heidelberg New York
- Lingner S (2003) "Legitimacy of tolerating limited environmental pollution? The case for natural attenuation", in: *Poiesis Et Praxis: International Journal of Technology Assessment and Ethics of Science* 2, 73 – 79
- Lingner S (2004) J. Loomis, G. Helfand: "Environmental policy analysis for decision making" (Book Review), in: *Poiesis Et Praxis: International Journal of Technology Assessment and Ethics of Science* Volume 3, Numbers 1 – 2, 148 – 151
- Lingner S (2004) (in cooperation with K. Ott, G. Klepper, S. Lingner, A. Schäfer, J. Scheffran, D. Sprinz) "Reasoning Goals of Climate Protection. Specification of Article 2 UNFCCC", Climate Change 01/04, Study report on behalf of the Federal Environmental Agency (UBA), Berlin
- Thiele F (2003) „Zur moralischen Bewertung der Patentierung von Genen." In: Düwell M, Steigleder K (Hrsg.) *Bioethik – Eine Einführung*. Suhrkamp, Frankfurt, 388–396
- Thiele F (2004) "Bioethics. Its foundation and its application in political decision-making", in: MacHamer P, Wolters G (eds): *Science, Values and Objectivity*. Proceedings of the 6<sup>th</sup> Pittsburgh-Konstanz Colloquium in the Philosophy of Science, Pittsburgh University Press, Pittsburgh, 256 – 274

## 4. Lectures

### Margret Engelhard

- 27.9.04 "Pharming – a new bioethical challenge?", joined autumn conference of the Europäische Akademie GmbH and the Chair of Ethics of the University of Lodz, Poland: "Bioethics in Germany and Poland, Tradition and Controversies", 26–28 September 2004, Łódź, Poland

### Minou Bernadette Friele

- 10.5.03 „Welche Legitimation haben nationale Ethik-Komitees?", Tagung der Philosophisch-Politischen Akademie in Verbindung mit dem Philosophischen Institut der Heinrich-Heine-Universität Düsseldorf
- 10–14.9.03 "Embryo Research and European Pluralism: Shall we strive for harmonising European regulations on embryo research?", European Science Foundation Workshop on Science & Human Values Harris Manchester College Oxford
- 24.–26.10.03 "Do committees ru(i)n our political culture? On the compatibility of bioethics committees and democracy", Deutsch-Italienisches Doktoranden-Kolloquium zur Bio-Ethik, Goethe-Institut Turin, Menaggio

### Thorsten Galert

- 25.10.03 „Können Tiere Schmerzen empfinden?", Deutsch-Italienisches Doktoranden-Kolloquium zur Bio-Ethik, Goethe-Institut Turin, Menaggio
- 20.9.04 „Eine wahrnehmungstheoretische Schmerzdefinition", Symposiumsvortrag, 123. Versammlung der Gesellschaft Deutscher Naturforscher und Ärzte (GDNÄ) „Raum – Zeit –Materie" 18. – 21.9.04, Passau
- 25.11.04 „Inwiefern können Eingriffe in das Gehirn die personale Identität bedrohen?", Technik in einer fragilen Welt, Konferenz des „Netzwerks TA", Berlin

### Carl Friedrich Gethmann

- 10.2.03 „Über den Ursprung des Sollens", Kulturwissenschaftliches Institut, Essen
- 16.6.03 „Ethos des Heilens vs. Effizienz des Gesundheitssystems", Fachgespräch „Effizienzdenken und moralische Verpflichtung im Gesundheitswesen" der FernUniversität Hagen und der Europäischen Akademie, Bad Neuenahr-Ahrweiler

- 27.6.03 „Freiheit des Willens oder Handlungsurheberschaft?“, Sitzung der Biologisch-Medizinischen Klasse der Berlin-Brandenburgischen Akademie der Wissenschaften, Berlin
- 4.7.03 „Kann das Ganze Thema der Forschung sein?“, Symposium „Vom Wissen zum Handeln? Die Forschung zum Globalen Wandel und ihre Umsetzung“, Institut für Technikfolgenabschätzung und Systemanalyse im Forschungszentrum Karlsruhe, Berlin
- 18.7.03 „Akzeptanz und Akzeptabilität. Ethische Fragen in der Biotechnologie“, 4. Sitzung der Projektgruppe „Biotechnologie“ des Technologiebeirates beim Ministerium für Wirtschaft, Verkehr, Landwirtschaft und Weinbau Rheinland-Pfalz, Mainz
- 18.9.03 „The Human Genom as a Fact and as a Task“, Autumn Conference of the Europäische Akademie „Human Nature and The Sciences. Current Challenges in a Franco-German Perspective“ (17.–19.09.03), Neuwied-Engers
- 9.10.03 „Unternehmensmoral. Die Rolle der Tugenden in der Wirtschaft“, Tagung Wirtschaftsunioren Rhein-Ahr, Bad Neuenahr-Ahrweiler
- 21.10.03 „Der moralische Status des Embryo“, Alexander von Humboldt-Stiftung, Bonn
- 25.10.03 „Die Geschichte der Ethik und Angewandten Ethik in der deutschen Philosophie des 20. Jahrhunderts“, Deutsch-Italienisches Doktoranden-Kolloquium zur Bio-Ethik, Goethe-Institut Turin, Menaggio
- 30.10.03 „Der Bericht der Bioethik-Kommission des Landes Rheinland-Pfalz zur Stammzellenproblematik“, Arbeitsgruppe Gentechnologie-Bericht der Berlin-Brandenburgischen Akademie der Wissenschaften, Berlin
- 13.11.03 „Gesundheit – Krankheit. Anthropologische und ethische Grundlagen eines kollektiv verantworteten Gesundheitssystems“, Akademievorlesung der Berlin-Brandenburgischen Akademie der Wissenschaften, Berlin
- 22.1.04 „Ethische Implikationen der Stammzellforschung“, Ringvorlesung „Dimensionen der Gentechnologie“ an der Universität Kassel
- 9.2.04 „Der moralische Status des Embryo“, Institut für Philosophie der Universität Bayreuth
- 12.2.04 „Oskar Beckers Grundprobleme existenzialen Denkens“, Kolloquium zu Umfeld und Wirkung der Philosophie Oskar Beckers, FernUniversität Hagen

- 24.2.04 „Gesundheit nach Maß?“ Podiumsdiskussion der Berlin-Brandenburgischen Akademie der Wissenschaften, Berlin
- 16.3.04 „A new Understanding of Health and Disease. A Philosopher's View“, Schering Kamingsgespräch, Berlin
- 25.3.04 „Ethische Probleme der gentechnischen Veränderung von Pflanzen“, 27. International Cotton Conference, Faserinstitut Bremen
- 1.4.04 „Der Alltag interdisziplinärer Forschung. Skizze eines Praxisberichts“, Frühjahrstagung der Europäischen Akademie „Die interdisziplinäre Funktion der Philosophie“ (31.03. – 02.04.04), Bad Neuenahr
- 8.5.04 „Der Ort des Erkennens. Unzeitgemäße Überlegungen“, Promotionsfeier der Wissenschaftlichen Hochschule für Unternehmensführung, Vallendar
- 26.5.04 „Der Ort des Erkennens. Philosophische Überlegungen zur Verfaßtheit der deutschen Universität“, Erfurter Universitätsrede, Universität Erfurt
- 28.8.04 „The Crisis of the Ethos of Science“, Session Moral Challenges to Science. Open Science Forum 2004, Stockholm
- 11.9.04 „Utilitare Prinzipien in der Lebendspende“, Symposium Ethik der Lebendorganspende“ der Akademie der Wissenschaften und der Literatur, Mainz
- 27.9.04 „Wissen und Macht“, Academica VIII. Plenarvortrag, Deutsch-Estnische Akademische Woche, Universität Tartu
- 27.9.04 „Wissenschaft und Gesellschaft“, Academica VIII. Seminarvortrag, Deutsch-Estnische Akademische Woche, Universität Tartu
- 21.10.04 „Wissenschaftsethos und Verantwortung des Wissenschaftlers“, Verlesungsreihe anlässlich des 125. Geburtstages von Max von Laue (Förderkreis Wirtschaft und Wissenschaft in der Hochschulregion Koblenz e.V.), Koblenz
- 4.11.04 „Darf der Mensch alles was er kann?“, Podiumsdiskussion Stadthalle Westerberg, Westerwald
- 8.11.04 „Wissenschaftlicher Forschergeist und gesellschaftliche Verantwortung – Max von Laue zum 125. Geburtstag“, Podiumsdiskussion: Landesvertretung Rheinland-Pfalz, Berlin
- 10.11.04 „Warum sollen wir überhaupt etwas und nicht vielmehr nichts?“, Institut für Philosophie der Universität Leipzig
- 18.11.04 „Die Bedeutung der Moral für das wirtschaftliche Handeln“, Industrie und Handelskammer zu Koblenz, Halsenbach-Ehr

- 24.11.04 „Neuer schöner Mensch? Möglichkeiten und Grenzen der Menschengestaltung durch Gentechnik und künstliche Intelligenz“, Podiumsdiskussion zur Eröffnung der Konferenz „Technik in einer fragilen Welt“, Berlin
- 29.11.04 „Was heißt universitäre Bildung?“ Podiumsdiskussion Friedrich Naumann-Stiftung, Mainz
- 4.12.04 „Ethische Aspekte des legalisierten Handelns mit Organen“ Mid-term Meeting der Projektgruppe „Anreize zur Organspende“, Berlin
- 13.12.04 „Ethische Grundlagen eines dauerhaften Gesundheitssystems“: Medizinerarbeitskreis des Vereins der Förderer der Europäischen Akademie, Bad Neuenahr-Ahrweiler

#### **Jorge Guerra Gonzalez**

- 4./5.3.03 Lehreinheit „Rechtliche und ethische Aspekte der biomedizinischen Wissenschaften“ in: Weiterbildungskurs „Fachreferent für anwendungsorientierte Biotechnologie“, TU-Harburg
- 10.06.03 „Xenotransplantation: Umgang des spanischen Rechtssystems mit dem Xenozoonosenrisiko.“ Interdisziplinäres Zentrum Medizin-Ethik-Recht an der Martin-Luther-Universität Halle-Wittenberg, Roßbach bei Naumburg
- 24.–26.10.03 “Xenotransplantation: The xenozoonosis risk and the German and Spanish constitution”, Deutsch-Italienisches Doktoranden-Kolloquium zur Bio-Ethik, Goethe-Institut Turin, Menaggio
- 24.11.03 “Animal cloning and the precautionary principle”, Universidad de Deusto, Bilbao, Spain

#### **Gerd Hanekamp**

- 21.1.03 „Nachhaltige Entwicklung und Innovation im Energiebereich“, INE-Colloquium, Forschungszentrum Jülich
- 2.2.04 „Handelt der homo oeconomicus?“, Philosophisches Kolloquium, Universität Marburg
- 25.11.04 „TA und Governance in einer robusten Welt“, Technik in einer fragilen Welt, Konferenz des „Netzwerks TA“, Berlin

#### **Rupert Leitner**

- 24.–26.10.03 “Responsibility and Uncertainty”, Deutsch-Italienisches Doktoranden-Kolloquium zur Bio-Ethik, Goethe-Institut Turin, Menaggio

- 14.-15.11.03 „Verantwortung für Technikfolgen“, Präsenzseminar: Probleme der Technikphilosophie, Vortrag und Moderation zu den Themen „Handeln unter Risiko“ und „Wertkonflikte in der Technikbeurteilung“, FernUniversität Hagen

**Stephan Lingner**

- 12.3.03 „Die normative Seite des Klimawandels“, BMU/BMBF-Expertengespräch zur Vorbereitung des vierten Sachstandsberichts des IPCC, BMBF, Bonn
- 4.12.03 „Typologie von Unsicherheiten mit Bezug auf das Klimaproblem“, DLR-Arbeitskreis „Uncertainties“, BMBF, Berlin
- 23.9.04 „Konkretisierung des Stabilisierungsziels der Klimarahmenkonvention – eine Einführung“, Klimapolitischer Salon im Auswärtigen Amt, Berlin
- 25.11.04 „Umgang mit Klimarisiken. Handlungsstrategien und Implikationen“, Technik in einer fragilen Welt, Konferenz des „Netzwerks TA“, Berlin

**Kathrin Prieß**

- 4.2.03 „Berufe und Werdegänge: Technikfolgenabschätzung und wissenschaftliche Politikberatung“ im Rahmen der Vortragsreihe: „Perspektiven für Biologen in Verantwortung für Mensch, Gesellschaft und Umwelt“ veranstaltet vom „Studium generale“ und der Fachschaft Biologie der Universität Mainz
- 21.5.03 „Korallenriffe – Entstehung, Biologie, Schutz“. Vortrag im DLR/EAC (Deutsches Zentrum für Luft- und Raumfahrt e.V./European Astronaut Center der ESA), Köln-Porz
- 28.08.03 „Biodiversität im interdisziplinären Diskurs. Versuch einer Begriffsklärung“: Interdisziplinäre Expertentagung im Rahmen des Übereinkommens über biologische Vielfalt. Bundesamt für Naturschutz – Internationale Naturschutzakademie (25.–29.08.03), Insel Vilm

**Felix Thiele**

- 24.–26.10.03 “Bioethics, its foundation and its application in political decision.”, Deutsch-Italienisches Doktoranden-Kolloquium zur Bio-Ethik, Goethe-Institut Turin, Menaggio
- 17.11.03 “Bioethis. Theory Et Application. The Case of “Green” Gene-Technology”. Vortrag im Rahmen der Einführungswoche für die neuen Ph.D. Studenten am European Molecular Biology Laboratory, Heidelberg

- 12.2.04 "Mastering moral conflicts on cell therapy" Workshop "Cell Therapy" der Berlin Brandenburgischen Akademie der Wissenschaften (BBAW), 12. – 14.2.2004, Berlin,
- 13.3.04 Transdisciplinarity in Research and Education. Atelier „La Transdisciplinarité dans le Institutions scientifiques en Europe. Pourquoi, comment?“, 12. – 13.4.2004, Paris
- 22.3.04 „Wissenschaft, Politik und Wissenschaftliche Politikberatung am Beispiel der Bioethik.“ Plenum der Jungen Akademie, 21. – 23.3.2004, Potsdam
- 8.9.04 „Arzt und Urteilskraft“ Festvortrag anlässlich der Verabschiedung von Professor Dr. M. Anlauf, Zentralkrankenhaus Reinkenheide, Bremerhaven
- 14.10.04 "Predictive medicine and practice in clinical medicine – the case of genetic testing." Annual meeting of the European association of centres of medical ethics. 14. – 16.10.2004. Institut Catholique de Lille, Centre d'Ethique Médicale, Lille
- 8.11.04 "Bioethis. Theory & Application." Vortrag im Rahmen der Einführungswoche für die neuen Ph.D. Studenten am European Molecular Biology Laboratory, Heidelberg
- 11.11.04 "Is there a difference between genetic data and conventional medical data?" Expert meeting: Genetic data and biobanks. Data protection, patient rights and research needs. Europäische Akademie für Informationsfreiheit und Datenschutz. 11.–12.11.2004, Berlin
- 12.11.04 „Moralische Probleme der Stammzellforschung.“ 5th Annual Meeting of the DFG-Priority Program 1109 'Embryonic and Tissue-Specific Stem Cells – Regenerative Systems for Cell and Tissue Repair'. 11.–13.11.2004, Potsdam

## 5. Teaching Activities

### Carl Friedrich Gethmann

- WS 2002/03 V Einführung in die Angewandte Philosophie (Studienkurs „Praktische Philosophie“)
- OS Selbstbestimmung und Zumutbarkeit (with B. Gräfrath and Th. Sander)  
Universität Duisburg-Essen
- SS 2003 OS Holismen (with B. Gräfrath and Th. Sander)  
Universität Duisburg-Essen
- WS 2003/04 V Einführung in die Ethik (Studienkurs „Praktische Philosophie“)

- OS Verteilungsgerechtigkeit  
Universität Duisburg-Essen
- SS 2004 OS Praktische Invarianz (with B. Gräfrath and Th. Sander)  
Universität Duisburg-Essen
- WS 2004/05 V Einführung in die Angewandte Philosophie (Studi-  
enkurs „Praktische Philosophie“)
- OS Egalitarismus (with B. Gräfrath and Th. Sander)  
Universität Duisburg-Essen

**Stephan Lingner**

as of WS 2000/01

continuously: Lecture/Seminar: Ökologie  
FH Koblenz/Remagen

**Rupert Leitner**

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

SS 03 Introduction into Business Economics  
FH Koblenz/Remagen

**Felix Thiele**

WS 02/03 Proseminar: Ethik & Globalisierung (Ethics & Globalisa-  
tion)  
Teaching assignment at the institute of philosophy  
Universität Duisburg-Essen

WS 03/04 Proseminar: Einführung in die Ethik (Introduction to  
Ethics)  
Teaching assignment at the institute of philosophy  
Universität Duisburg-Essen

## **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.

#### *Publication*

Bioethics: Its foundation and its application in political decision-making.  
In: MacHamer P, Wolters G (eds) *Science, Values and Objectivity*. (2004)  
(Proceedings of the 6<sup>th</sup> Pittsburgh-Konstanz Colloquium in the Philoso-  
phy of Science), Pittsburgh University Press, Pittsburgh, S. 256 – 274

### 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 intended 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').

#### *Publications*

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

Kulturalistische Unternehmensethik. Begründung und Anwendung. In: Friesen H, Berr K (2004) *Angewandte Ethik im Spannungsfeld von Begründung und Anwendung*. Lang, Frankfurt a.M.

## 6.2 Doctorate Programme

### 6.2.3 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 understanding 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 Institut für Philosophie at the FernUniversität Hagen and supervised by Professor Dr. Annemarie Gethmann-Siefert.

### 6.2.4 *Rupert Leitner*

#### **Responsibility for Unforeseeable Consequences of Technological Innovation**

In the face of uncertain undesired consequences of actions and especially with regard to the problem of how to cope with the danger of damage due to unforeseeable consequences of technological innovation the problem of the attribution and distribution of responsibility is particularly hard to solve. The question is above all, whether in this case responsibility can be attributed at all, and in the affirmative case, to whom, for which aims and with which consequences. The following three theses will be argued for: firstly that based on the twofold aim of reducing the potential of unforeseeable harmful effects of technologies and of improving the prevention for the case of their occurrence there are good reasons for the attribution of responsibility, secondly that the suitable subject capable of assuming this responsibility – mainly in the form of liability – is the business corporation, and thirdly that the consequences of this distribution of responsibility and of the therewith connected economic burden will be beneficial in the long run for both damage prevention and technological innovation.

The thesis “Responsibility for Unforeseeable Consequences of Technological Innovation” by Rupert Leitner will be prepared at the Institut für Philosophie at the Universität Duisburg-Essen under the supervision of Professor Dr. Dr. h.c. Carl Friedrich Gethmann.

### 6.2.5 *Wolf Rathgeber*

#### **Superresolution by Application of Spectral Estimation Techniques in SAR Processing**

Synthetic Aperture Radar (SAR) is a well known imaging method for purposes like environmental monitoring, civil protection and earth observation. Resolution, both geometric and radiometric, is an important parameter of quality for the acquired images.

Processing is carried out in different domains and at some stage requires the estimation of frequency content. Conventional Radar systems use the Fourier transform to model the appearing signals. This treatment ensures robust, i.e. noise insensitive, performance but suffers from a fundamental resolution limit. The thesis demonstrates the use of new mathematical signal models incorporating a-priori-information and overcoming the resolution limit mentioned above, leading to so called superresolution.

Fully two dimensional versions of these new mathematical signal models are computationally intensive. Therefore, the thesis also develops a scheme for replacing two dimensional processing by sequential one dimensional processing. This results in highly resolved images with moderate computation overhead.

The dissertation of Wolfgang Rathgeber is supervised by Professor Dr. Werner Wiesbeck from the Institut für Höchsthfrequenztechnik und Elektronik at the Universität Karlsruhe (TH) and Professor Dr. Alberto Moreira from the Institut für Hochfrequenztechnik und Radarsysteme at the Deutsches Zentrum für Luft- und Raumfahrt (DLR).

### 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 scientific 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 2003, Professor Dr. Erzsebet Rosza from the University of Debrecen, Hungary, and Dr. Garrath Williams from the Lancaster University, were awarded fellowships at the Europäische Akademie. Professor Rosza's background has been in the area research of the philosophy of Hegel. Her fellowship covered the the period 1.3. – 31.8.2003. Her work at the Europäische Akademie revolved around the area of Technology Assessment in Hungary.

Dr. William's academic background has been in the areas of moral and political philosophy. His fellowship at the Akademie covered the period 7.7. – 7.10.2003 and his work included research on the nature of responsibility.

Contact: Dr. phil. Margret Engelhard, Dipl.-Biol.  
margret.engelhard.@dlr.de

## 8. Colloquiums of the Academy

- 10.7.03 Professor Dr. Erzsébet Rozsa (University of Debrecen): Lage der Wissenschaftsethik in Ungarn
- 25.9.03 Dr. Garrath Williams (Lancaster University): Responsibility as a Virtue
- 23.10.03 Dr. Rainer Adolphi (TU Berlin): Reichweiten der Begründbarkeit: Das Beispiel des Politischen
- 6.5.04 Dr. Stephan Bröchler (Fernuniversität Hagen): Die Technik des Regierens. Die Bedeutung neuer IuK-Technik für die Regierungszentralen in Deutschland, Österreich und der Schweiz
- 16.12.04 Dr. Felix Thiele: Einwilligung

## 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)  
Dipl.-Päd. Ulrike Henckel (from 1.7. – 31.12.03)

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)**.

#### **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**

Dr. Stephan Lingner gave advice for German contributions to the 4<sup>th</sup> Assessment Report of the Intergovernmental Panel of Climate Change. In

summer 2003 he joined a multi-disciplinary working group on "The role of uncertainties associated with projections of climate change", coordinated by Professor Dr. R. Sausen (DLR Oberpfaffenhofen).

### **Ethics of Medicine**

The further studies in 'ethics of medicine' are offered in cooperation between the Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen Bad Neuenahr-Ahrweiler GmbH, the FernUniversität Hagen, the Institut für Geschichte, Theorie und Ethik der Medizin der Johannes Gutenberg-Universität Mainz and the Max-Delbrück-Centrum Berlin.

The aim of the two-year studies starting in summer 2005 is to enable the students to analyse the moral and ethical aspects of various situations. The students will be physicians, who have finished their studies in medicine. The study of 'ethics in medicine', in which the research results of the Europäische Akademie will be integrated, include the following subjects:

#### First year

- I. Basics of ethics and philosophical anthropology
- II. Basics of applied ethics/anthropology
- III. Justice
- IV. Acting of physicians in health care system

#### Second year

- I. Transplantations
- II. Genetical diagnosis
- III. Reproduction medicine
- IV. Ethics of medicine and law

## **9.2 Memberships 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) (represented by Professor Dr. C. F. Gethmann)
- European Society for Philosophy of Medicine and Health Care (ESPMH)
- HGF-Programmausschuss „Systemanalyse und Technikfolgenabschätzung“

- Ad hoc-committees of the Federal Research Ministry (BMBF) on questions of global change
- Netzwerk TA

## 10. Regional Activities

### 10.1 Sponsors Club

The sponsors club, *Verein der Förderer*, was founded 15th November 2001 by companies and citizens of the Landkreis Ahrweiler, to support the Europäische Akademie in scientific and regional activities. To this end, the 22 members of the association support science in the field of ethics and Technology Assessment and maintain close contact with the regional economy and organisations.

Other regional activities are the permanent art exhibitions which are shown within the rooms of the Europäische Akademie and the workshops of the working group Medical Ethics (*Arbeitskreis Medizinethik*). In summary, the tasks of the sponsors club are concentrated on three main fields: Science, Economy, Art.

#### *10.1.1 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 four times a year 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.

2003

- 12.5.2003 Ethische Fallbesprechung: Ethische Fallbesprechung in der Praxis – Die Nijmegener Methode  
Dr. Norbert Steinkamp
- 10.3.2003 Organentnahme: Praktische und ethische Aspekte der Organentnahme  
PD Dr. Ralf Bickeböller

2004

- 8.3.2004 Präimplantationsdiagnostik (PID) aus ethischer Sicht  
Dr. Felix Thiele, M.Sc.
- 13.9.2004 Gesundheitsstandards aus ökonomischer Sicht  
Professor Dr. K.-D. Henke
- 13.12.2004 Gesundheitsstandards aus ethischer Sicht  
Professor Dr. Dr.h.c. Carl F. Gethmann

### *10.1.2 Vernissage*

2003

- October 2002 – March 2003 Sabine Sturma-Bachem  
Ordnungen
- May 2003 – September 2003 Ursula Witzlau  
Malerei, Combine Painting

2004

- September 2003 – September 2004 Günter Winkler  
Bilder
- September 2004 – May 2005 Margarete Gebauer  
Bilder, Skulpturen

## **10.2 Lecture Events in Cooperation with the Kreissparkasse Ahrweiler**

- 5.6.2003 Professor Dr. Julian Nida-Rümelin (Universität Göttingen)  
„Das Ethos der Wahrhaftigkeit – im Alltagsleben und in der  
Politik“  
SETA Hotel Bad Neuenahr, Germany
- 13.10.2003 Professor Dr. iur. Reinhard Merkel (Universität Hamburg)  
„Gerechter Krieg? Ethische und juristische Überlegungen  
zum Begriff der ‚humanitären Intervention‘“  
SETA Hotel Bad Neuenahr, Germany
- 31.3.2004 Professor Dr. Jürgen Mittelstraß (Universität Konstanz)  
„Vom Nutzen der Philosophie“  
SETA Hotel Bad Neuenahr, Germany

## **10.3 Press Conference**

- 3.3.2003 Topics: "Research Report 2001–2002 of the Europäische  
Akademie" and "New tasks of the Sponsors Club (Verein der  
Förderer e.V.)"

## **V Appendix**

### **1. Managing Committee**

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

Staatssekretär Roland *Härtel*, Ministerium für Bildung, Wissenschaft und Weiterbildung, Weiterbildung, Forschung und Kultur Rheinland-Pfalz (vice chair)

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

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

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

Professor Dr. jur. Peter *Marburger*, Trier (chair)

Professor Dr. phil. Peter *Fricker*, Bern

Professor Dr. med. Detlev *Ganten*, Berlin

Professor Dr. W. J. *Geysen*, Leuven

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

Dr.-Ing. Margarete *Hofmann-Antenbrink*, Pully

Professor Dr. Jörg *Michaelis*, Mainz

Professor Dr. phil. Jürgen *Mittelstraß*, Konstanz

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

### **3. Council**

Professor Dr. Wouter *Achterberg* †, Amsterdam

Professor Dr. rer. nat. 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. Deryck *Beyleveld*, Sheffield

Professor Dr. Kornelis *Blok*, Utrecht

Gerard *Boer*, Ph.D., Amsterdam

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. Wolfgang von den *Daele*, Berlin  
Professor Dr. jur. Jos *Dumortier*, Leuven  
Professor Dr. med. Friedrich W. *Eigler*, Essen  
Professor Dr. rer. pol. Holger *Ernst*, Koblenz  
Professor Dr. rer. nat. Georg *Fey*, Erlangen  
Professor Dagfinn *Føllesdal*, Ph.D., Oslo/Standford  
Professor Dr. phil. Christa *Fonatsch*, Wien  
Professor Dr. jur. Walter *Frenz*, Aachen  
Professor Dr. rer. nat. Harald *Fuchs*, Münster  
Professor Dr. K. William M. *Fulford*, Warwick  
Dr. jur. Riccardo *Genghini*, Mailand  
Professor Dr. med. Joachim *Gilsbach*, Aachen  
Professor Dr. med. Barbara *Griefahn*, Dortmund  
Dr. rer. nat. Werner *Grünwald*, Stuttgart  
Professor Dr. rer. nat. Armin *Grunwald*, Karlsruhe  
Professor Dr. sc. nat. Hans-Joachim *Güntherodt*, Basel  
Professor Dr. med. Gundolf *Gubernatis*, Hannover  
Professor Dr. agr. Robert *Guderian*, Essen  
Professor Dr. med. Dr. rer. nat. habil. Walter H. *Günzburg*, Wien  
Per *Hall* M.D., Ph.D., Stockholm  
Professor Dr. med. Dr. med. vet. Claus *Hammer*, München  
Professor Dr.-Ing. Helmut *Harig*, Bremen  
Professor Dr. phil. Dirk *Hartmann*, Essen  
Professor Dr. Axel *Haverich*, Hannover  
Priv.-Doz. Dr. Jan-Georg *Hengstler*, Mainz  
Professor Dr. Klaus-Dirk *Henke*, Berlin  
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 *Hołowka*, 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 nadzw. Dr. hab. Andrzej M. *Kaniowski*, Lodz  
Professor Dr. rer. nat. Wolfgang *Kaysser*, Köln  
Professor Dr. phil. habil. Andrzej *Kiepas*, Katowice  
Professor Gernot Klepper, *Ph.D.*, Kiel  
Professor Dr. phil. Hartmut *Kliemt*, Duisburg  
Professor Dr. jur. Michael *Kloepfer*, Berlin  
Dr. Gerrit *Koenen*, Den Haag  
Professor Dr. jur. Dr. med. Christian *Kopetzki*, Wien  
Dr. rer. nat. Harald *Krug*, Karlsruhe  
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  
Professor Dr. sc. techn. ETH Werner K. *Lutz*, Würzburg  
Dr. phil. Petr *Machleidt*, Prag  
Priv.-Doz. Dr. Ulrich *Martin*, Hannover  
Professor Dr. Bernd Baron von *Maydell*, München  
Dr. phil. nat. Marcel *Mayor*, Karlsruhe  
Professor Dr. iur. Reinhard *Merkel*, Hamburg  
Professor Dr. Cees *Midden*, Eindhoven  
Professor Dr. Beran *Moseley*, Reading  
Professor Dr. Ruud *Muffels*, Tilburg  
Professor Dr. med. Dr. med. dent. Dr. h.c. Wolfgang *Müller-Ruchholtz*, Kiel  
Bart *Nuttin*, M.D., Ph.D., Leuven  
Professor Dr. rer. pol. Hans G. *Nutzinger*, Kassel  
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. Michael *Quante*, Essen  
Professor Pirrko-Liisa *Rauhala*, Ph.D., Helsinki  
Professor Dr. jur. Eckard *Rehbinder*, Frankfurt a. M.  
Professor Dr. rer. pol. Ortwin *Renn*, Stuttgart  
Professor Dr.-Ing. Rainer *Renz*, Kaiserslautern  
Priv.-Doz. Dr. med Steffen K. *Rosahl*, Freiburg  
Professor Dr. phil. Georg *Rudinger*, Bonn  
Professor Dr. rer. nat. Heinz *Saedler*, Köln  
Professor Dr. med. Hans Jürgen *Schlitt*, Regensburg  
Professor Dr. rer. nat. Günter *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. rer. nat. Ulrich *Simon*, Aachen  
Professor Davor *Solter*, M.D., Ph.D., Freiburg  
Detlef *Sprinz*, Ph.D., Potsdam  
Professor Dr. rer. pol. Ulrich *Steger*, Lausanne  
Professor Dr.-Ing. Gerhard *Steinebach*, Kaiserslautern  
Professor Dr. phil. Fritz F. *Steininger*, Frankfurt a. M.  
Professor Dr. rer. nat. Dr. med. 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. phil. nat. Viola *Vogel*, Zürich  
Dr. Gert *Verschraegen*, Leuven  
Professor Dr. sc. pol. Reinhard *Voßbein*, Wuppertal  
Professor Dr.-Ing. Heinrich B. *Weyer*, Köln  
Professor Dr. jur. Dr. h.c. Rüdiger *Wolfrum*, Heidelberg  
Dr. jur. Peter *Wysk*, Münster  
Professor Dr. rer. pol. Thomas *Ziesemer*, Maastricht  
Professor Dr. Maciej *Zukowski*, Poznan

## 4. Staff

### Management

Professor Dr. phil. Dr. phil. h.c. 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-Universität Bochum; 1978 habilitation for philosophy at the Universität Konstanz. 1968 assistant professor; 1972 lecturer in philosophy at the Universität Duisburg-Essen; 1978 private lecturer at the Universität Konstanz; 1979 professor of philosophy at the Universität Duisburg-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 Duisburg-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. phil. Gerd *Hanekamp*, Dipl.-Chem.  
(Vice-director)

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 at the Europäische Akademie. He was manager of the projects "Environmental Standards. Combined Exposures and their Effect on Humans and their Environment" and "Sustainable Development and Innovation in the Energy Sector".

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 of the director of the Europäische Akademie, responsible for administrative issues.

Dr. med. Felix *Thiele*, 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 Universität 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 für Molekulare Medizin Berlin-Buch in the field of science management. Since July 1998 he has been working 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 has been vice-director of the Europäische Akademie.

### **Organization and Administration**

Kerstin *Grosser* (exited 2/2003)  
(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 administrative business employee, 1993 – 1997 family phase; 1997 – 2001 office clerk in small enterprises, 2001 qualification seminar MS Office User Specialist; from February 2002 to February 2003 assistant 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* (exited 10/2003)  
(General administration)

1970 – 1975 study of Anglistics and Romance languages and literatures at the universities of 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 Rheinstahl Technik GmbH, Düsseldorf. 1983 – 1986 family break, 1986 – 2001 secretary with different international firms. From November 2001 to October 2003 commercial clerk with the Europäische Akademie GmbH.

Dipl.-Päd. Sevim *Kiliç*  
(Editing, public relations)

1992 – 1994 studies for the State Examination as Foreign Language Correspondent (English and French) in business and administration at the Kaufmännische Lehranstalten Bremerhaven, afterwards staff member (as commercial correspondent) of Rogge Marine Consulting GmbH for one year. 1995 – 2001 studies of education (adult education and extracurricular youth education), psychology, sociology and philosophy at the Johannes Gutenberg-Universität Mainz. Final Examination: Diplom-Pädagogin. 1996 – 1997 assistant at the Max Planck Institut für Chemie (Otto Hahn Institut) Mainz with the work areas planning, organization, execution and evaluation of scientific congresses (with stays in Heidelberg [1 month], Strasbourg [5 months]). 1998 – 2002 freelance staff member in the newsroom („Rheinland Pfalz aktuell“) and personnel development department of the Südwestrundfunk Mainz (SWR). Since April 2002 member of the staff at the Europäische Akademie and responsible for editing and public relations.

Daniela *Nies* (exited 10/2003)  
(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; from January 1998 to October 2003 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 relations)

1965 – 1969 studies of English and French at the Auslands- und Dolmetscher-Institut Germersheim der Universität Mainz (Institute for

Interpreters and Translators in Gernersheim, 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, 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.

Friederike *Wütscher*  
(Editing, public relations)

1991 – 1997 studies of English and German at the Universität zu 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 member of the staff at the Europäische Akademie and responsible for editing and public relations.

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. phil. Margret *Engelhard*

1990–1997 study of biology with microbiology as a main subject at the Philipps-Universität Marburg, Germany, at the University of Edinburgh, Scotland and with an external diploma thesis at the Max-Planck-Institute for Terrestrial Microbiology, Marburg. 08/1995 – 09/1995 research expedition to Nepal to collect microbial samples for the diploma thesis, 1997 Dipl.-Biol., 08/1997 – 06/2004 PhD course at the Botanical Institute of the University of Basle, Switzerland with micro- and molecular biology and botany as main fields of research. 11/1997 – 01/1998 research stay at the Laboratoire de Biologie Moléculaire des Plantes Supérieures, University of Geneva, Switzerland, 2004 Dr. phil. with the dissertation "The role of trehalose in nitrogen fixing nodule symbiosis: studies of rhizobia deficient in the trehalose-6-phosphate synthase genes *otsA*". Since January 2004, member of the scientific staff at the Europäische Akademie and project coordinator of "Incentives for Organ Donation".

Minou Bernadette *Friele*, M.A. (exited 12/2003)

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. From October 1999 to December 2003 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"; project coordinator of "Embryo Experimentation in Europe".

Dr. phil Thorsten *Galert*, M.A.

1991 – 1997 studies of philosophy and chemistry in Marburg and Vienna. 02/97 magister-exam (M.A.) with a treatise on ethics of compassion („Mitleidsethik“) at Philipps-Universität Marburg. 1997 – 1998 Preparation of a scientific bibliography and a literature review on "Die Bewahrung von Biodiversität als Problem der Naturethik" (Graue Reihe, vol. 12) as a work on contract for the Europäische Akademie. 1998 – 2003 Ph.D.-studies on basic problems of research pertaining to animal consciousness in general and animal pain in particular (title of the thesis: "Vom Schmerz der Tiere. Grundlagenprobleme der Erforschung tierischen Bewußtseins"), concluded in 05/04 by defending his thesis (Disputation). Since January 2004 member of the scientific staff at the Europäische Akademie and coordinator of the project group "Intervening in the Psyche. Novel Possibilities as Social Challenges".

Jorge Guerra *González*, Letrado Asesor de Empresas (E-1) und Licenciatura en Derecho

1988 – 1993: Master's Degree in Law and Legal Adviser for Enterprises (E-1) at the University Pontificia Comillas, ICADE, Madrid. 1994 – 1999: Master's Degree in Economics and Sociology at the University of Lüneburg. Since June 2002 scientific assistant at the Europäische Akademie.

Dipl. Päd. Ulrike *Henckel*

1979 first state examination for teaching profession at Cologne. 1986: diploma in pedagogics, psychology and sociology at the Universität zu Köln. 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'.

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. At the same time, he studied philosophy, sociology and psychology at the FernUniversität Hagen. Before 2002, he had been working for a major international consulting firm in Hamburg. In 2002, Dott. Rupert Leitner joined the Europäische Akademie to work on his dissertation on the problem of the ignorance of possible consequences in the evaluation process of technology innovation options. He is member of the study group "Practical Philosophy".

Dr. Miltos *Ladikas* (exited 3/2004)

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 Ph.D. 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); from 2000 to March 2004 member of the scientific staff at the Europäische Akademie. He managed the project "Functional Foods".

Dr. rer. nat. Stephan *Lingner*, Dipl.-Geol.

Studies in geology with focus on geochemistry at the Universität Würzburg and the Universität Tübingen; 1984 Diploma. 1990: doctorate in planetary science at the Universität Münster, 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 "Climate prediction and climate precautions", study group „Präventiver Bodenschutz" and the study "Reasoning goals of climate protection" on behalf of the Federal Environmental Agency of Germany (UBA). Furthermore, coordinator of the project, "Environmental noise; Risk assessment and regulations in the traffic sector". Since the year 2000: associate lecturer in "Ecology" at the University of Applied Sciences, Remagen.

Dr. rer. nat. Kathrin *Priess* (exited 3/2004)

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-Marseilles II (Université de la Méditerranée) and the Christian-Albrecht Universität 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. From November 1999 to March 2004 member of the scientific staff at the Europäische Akademie Bad-Neuenahr-Ahrweiler GmbH, coordinator for the publication of the project "Biodiversity – Scientific Foundations and Social Relevance" and project coordinator of "Environmental standards. Dose-effect Relations in the Low Dose Range and their Risk Evaluation".

Dipl.-Ing. Wolfgang *Rathgeber*

1991 – 1998 study of Electrical Engineering at the universities of Erlangen, Campinas (Brazil) and Valencia (Spain). 1999 – 2004 PhD thesis at the Universität Karlsruhe. From 2/99 – 1/03 PhD student at the Institut für Hochfrequenztechnik und Radarsysteme, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Oberpfaffenhofen (Institute of Radio Frequency Engineering and Radar Systems, German Aerospace Center, Oberpfaffenhofen). Since June 2003 member of scientific staff at the Europäische Akademie, coordinator of the project group "Nanomaterials, Nanodevices, Nanocomputing. Determination of Present Position and Perspectives" and coordinator of the IT sector.

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

Apprenticeship in Kreissparkasse in Siegburg as bank clerk until 1998, Studies of business management at the Technische Universität Köln, Dipl.-Kfm. (FH) 2002, Internships in the communication agency atw:kom-munikation 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) at the Europäische Akademie.

## 5. Archive

### Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien

(Duration: 01/97 – 12/98)

#### *Members*

Professor Dr.-Ing. Helmuth Harig, Faserinstitut Bremen e.V. und Fachbereich Produktionstechnik -Werkstofftechnik- der Universität Bremen (*chair*)

– 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 coordination:* Dr.-Ing. Christian J. Langenbach

#### *Final Report*

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

#### *Publications*

H. Harig et al. (1997): „*Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien. Perspektiven in der Verkehrstechnik*“,

Endbericht zum Vorprojekt, Graue Reihe Nr. 4, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

H. Harig, C. J. Langenbach (1999): „*Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien*“, Memorandum, Springer Verlag, Berlin/Heidelberg/New York

C. J. Langenbach (1997): „Technikfolgenbeurteilung der Erforschung und Entwicklung neuer Materialien“, in: *Informationen zur TA, DLR, VDI, VDI/VDE* (Hgg.), 10/1997, 9 – 10

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

M. Socher, 1997: „Neue Werkstoffe – ein interessantes Thema für die Technikfolgenforschung“, Rezension, in: *TA-Datenbank-Nachrichten*, Nr. 3/4, 6. Jahrgang, November 1997, 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*

Professor Dr. rer. nat. Dr. med. h. c. Christian Streffer, Universität Essen (*chair*)

– 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 Reh binder, Universität Frankfurt a. M.

– Professor Dr. rer. pol. Ortwin Renn, Akademie für Technikfolgenabschätzung in Baden-Württemberg

### *Project coordination:*

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

Dr. phil. Gerd Hanekamp, Dipl.-Chem. (from 10/98)

### *Final Report*

C. Streffer, J. Bücken, A. Cansier, D. Cansier, C. F. Gethmann, R. Guderian, G. Hanekamp, D. Henschler, G. Pöch, E. Reh binder, O. Renn, M. Slesina, K. Wuttké (2000): *Umweltstandards. Kombinierte Expositionen und ihre Auswir-*

kungen auf den Menschen und seine Umwelt. Springer. Berlin, Heidelberg (book series „Wissenschaftsethik und Technikfolgenbeurteilung“ vol. 5)

#### *Publications*

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

Saupe, S. (1998): „Environmental Standards for Combined Exposures? Ethical and Legal Aspects“, in: *Preprints der Jahrestagung der Societas Ethica*, 19. – 23.08., Turku, Finnland, 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*

Professor Dr. phil. Jan P. Beckmann, Institut für Philosophie, FernUniversität Hagen (*chair*)

- 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 coordination:*

Dr. rer. nat. Eva M. Neumann-Held

#### *Final report*

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

*Publications*

Beckmann, Jan P. (1997): *Xenotransplantation. Ethische Fragen und Probleme*. Graue Reihe Nr. 7. Europäische Akademie GmbH, Bad-Neuenahr-Ahrweiler.

Neumann-Held, Eva M. (1998): Xenotransplantation von Zellen, Geweben oder Organen. Wissenschaftliche Entwicklungen, ethische Implikationen und gesellschaftliche Relevanz. in: *TA-Datenbank-Nachrichten* 11/98

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*

Professor Dr. med. Claus R. Bartram, Institut für Humangenetik, Universität Heidelberg (*chair*)

– 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

*Project coordination:*

Dr. med. Felix Thiele, M.Sc.

*Final Report*

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

### *Publications*

Thiele F. (1999): Ethische Fragen und gesellschaftliche Folgen der Humangenetik. In: *TA-Datenbank-Nachrichten*, Nr. 1, 8.Jg., 3/99

Thiele F. (ed) (2000): *Genetische Diagnostik und Versicherungsschutz. Die Situation in Deutschland*. Graue Reihe Nr. 20, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

For details please see: Forschungsbericht 1999 – 2000.

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

(Duration: 10/97 – 10/99)

### *Members*

- Professor Dr. phil. Peter Janich, Institut für Philosophie, Philipps-Universität Marburg (*chair*)
- 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 coordination:*

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

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

### *Final Report*

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

### *Publications*

Amann, R., Rossello-Mora, R (2000).: *The Species Concept in Prokaryotic Taxonomy*, Graue Reihe Nr. 22, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

Barthlott, Wilhelm u. Gutmann, Mathias (eds) (1998): *Biodiversitätsforschung in Deutschland: Potentiale und Perspektiven*, Graue Reihe Nr. 11, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

Galert, Thorsten (1998): *Biodiversität als Problem der Naturethik. Literaturreview und Bibliographie*, Graue Reihe Nr. 12, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

Gutmann, Mathias, Janich, Peter (1997): *Zur Wissenschaftstheorie der Genetik. Materialien zum Genbegriff*, Graue Reihe Nr. 5, Europäische Akademie GmbH, 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.

## **Electronic Signatures. Cultural Controllability and Moral Justifiability**

Duration: 09/99 – 11/01

### *Members*

- Dr. rer. pol. Otto Ulrich, Referat Technikfolgen-Abschätzung, Bundesamt für Sicherheit in der Informationstechnik (BSI), Bonn (*chair*)
- Professor Dr. sc. phil. Gerhard Banse, Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Forschungszentrum Karlsruhe – Technik und Umwelt
- Dr. jur. Helmut Bäumler, Landesbeauftragter für den Datenschutz Schleswig-Holstein, Kiel
- Professor Dr. jur. Jos Dumortier, Interdisciplinary Centre for Law and Information Technology (IRCI), K.U. Leuven
- Dr. jur. Riccardo Genghini, Studio Notarile Genghini, Mailand
- Professor Dr. phil. habil. Andrzej Kiepas, Institut für Philosophie, Schlesische Universität Katowice

- Professor Dr. jur. Bernd Lutterbeck, Institut für Angewandte Informatik, Technische Universität Berlin
- Dr. phil. Petr Machleidt, Center for Science, Technology, Society Studies (CSTSS) at the Institute of Philosophy, Academy of Science Prague
- Professor Dr. rer. nat. Andreas Pfitzmann, Institut für Theoretische Informatik, Technische Universität Dresden
- Professor Dr. phil. Georg Rudinger, Psychologisches Institut, Abt. Methodenlehre, Diagnostik & EDV, Universität Bonn
- Professor Dr. sc. pol. Reinhard Voßbein, Unternehmens- und Informations-Management Consultants Dr. Voßbein Unternehmensberatung (UIMC), Wuppertal

*Project coordination:*

Dr.-Ing. Christian J. Langenbach

*Final Report*

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

*Publications*

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

C.J. Langenbach (1999): „Elektronische Unterschrift. Verliert der Bürger seine Identität?“, in: *Akademie-Brief Nr. 15*, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

O. Ulrich (1999): „*Protection Profile – ein industriepolitischer Ansatz zur Förderung des „neuen Datenschutzes“*“, Graue Reihe Nr. 17, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

G. Banse, C.J. Langenbach, O. Ulrich (1999): „*Digitale Signaturen im Weitblick*“, KES 99/5, SecuMedia Verlag Ingelheim, S. 85-87

For details please see: Research Report 2001 – 2002.

## **Robotics: Options for Human Replaceability**

(Duration: 2/99 – 1/01)

*Members*

- Professor Dr. rer. nat. Thomas Christaller, Institute for Autonomous Intelligent Systems, FhG Sankt Augustin (*chair*)

- Professor Dr. med. Joachim Gilsbach, Neuro-surgical Clinic, University Clinic of the RWTH Aachen
- Professor Dr.-Ing. Gerd Hirzinger, Institute for Robotics and Mechatronics, DLR – German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt )
- 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, Institute for International Law (Working Group on Law Informatics), University of Vienna
- Professor Dr.-Ing. Gerhard Schweitzer, Institute für Robotics, ETH Zürich
- Professor Dr. phil. Dieter Sturma, Faculty 1 Philosophy, University of Essen

*Project coordination:*

Dr. rer. nat. Michael Decker

*Final Report*

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

*Publications*

Christaller T., Decker M., Gilsbach J.-M., Hirzinger G., Lauterbach K., Schweighofer E., Schweitzer G., Sturma D.: "Robotics (2001): *Perspectives for Human Action in Future Society*". Springer Berlin/Heidelberg. ISBN 3-540-42779-1

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

Decker, M. (1997): "*Perspectives of Robotics. Considerations on Human Replaceability*", Graue Reihe No. 8, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

Decker, M. (ed) (1999): "*Robotics. Introduction to an Interdisciplinary Discussion*" Graue Reihe No. 16, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler

Decker, M. (1999): "Robotics: Options for Human Replaceability". in: *TA-Datenbank-Nachrichten*, vol.8, No. 3/4, 72-74

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

For details please see: Research Report 2001 – 2002.

## Climate Prediction and Climate Precautions

(Duration: 12/98 – 12/01)

### *Members*

- Professor Dr. iur. Meinhard Schröder, Lehrstuhl für in- und ausländisches öffentliches Recht, Völker- und Europarecht und Institut für Umwelt- und Technikrecht, Universität Trier (*chair*)
- Professor Dr. rer. nat. Martin Claussen, Potsdam Institut für Klimafolgenforschung & Institut für Meteorologie der Freien Universität Berlin
- Professor Dr. rer. nat. Armin Grunwald, Institut für Technikfolgenabschätzung und Systemanalyse, Forschungszentrum Karlsruhe
- Professor Dr. rer. nat. Andreas Hense, Meteorologisches Institut, Universität Bonn
- Professor Gernot Klepper, Ph. D., Institut für Weltwirtschaft, Universität Kiel
- Professor Dr. phil. Konrad Ott, Professorship „Umweltethik“, Universität Greifswald
- Professor Dr. rer. pol. Dieter Schmitt, Lehrstuhl Energiewirtschaft, Universität Essen
- Detlef Sprinz, Ph. D., Potsdam Institut für Klimafolgenforschung (Dept. Global Change & Social Systems)

### *Project Coordination:*

Dr. rer. nat. Stephan Lingner, Dipl.-Geol.

### *Final Report*

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

### *Publications*

Lingner, S. Gethmann, C.F. (1997): *Klimavorhersage und -vorsorge*. Graue Reihe No. 6, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler.

Lingner, S. (1999): Klimavorhersage und -vorsorge. Aufgaben und Ziele eines interdisziplinären Forschungsprojekts. In: *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 GmbH, Bad Neuenahr-Ahrweiler

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

For details please see: Research Report 2001 – 2002.

## **Sustainable Development and Innovation in the Energy Sector**

(Duration: 9/00 – 8/02)

### *Members*

- Professor Dr. rer. pol. Ulrich Steger, IMD Lausanne (*chair*)
- Professor Dr. Wouter Achterberg †, Applied Philosophy Group, Wageningen Agricultural University and University of Amsterdam
- Professor Dr. Kornelis Blok, Department of Science, Technology and Society, Utrecht University
- Professor Dr. jur. Walter Frenz, Lehr- und Forschungsgebiet Berg- und Umweltrecht, RWTH Aachen
- Professor Dr. sc.nat. Dieter Imboden, Umweltphysik, Institut für Gewässerschutz und Wassertechnologie, ETH Zürich
- Professor Dr. rer. pol. Rudi Kurz, Institut für Volkswirtschaftslehre der Fachhochschule Pforzheim
- Professor Dr. rer. pol. Hans G. Nutzinger, Fachbereich Wirtschaftswissenschaften der Universität GH Kassel
- Professor Dr. rer. pol. Thomas Ziesemer, Maastricht Economic Research Institute on Innovation and Technology (MERIT), Universität Maastricht

### *Project Coordination:*

Dr. phil. Gerd Hanekamp, Dipl.-Chem.

### *Final Report*

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

### *Publications*

Hanekamp G., Steger U. (ed.) (2001) *Nachhaltige Entwicklung und Innovation im Energiebereich*. Graue Reihe No. 28, Europäischen Akademie GmbH, Bad Neuenahr-Ahrweiler

For details please see: Research Report 2001 – 2002.

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