



Europäische Akademie

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

Direktor:
Professor Dr. Carl Friedrich Gethmann

Newsletter

Akademie-Brief ▪ No. 29 (Dezember 2001)

Editorial

The promotion of young scientists has been one of the important tasks of the Europäische Akademie since its foundation in 1996. The Academy supports young scientists from philosophy, the natural as well as the social and the engineering sciences and from the medical disciplines. The Ph.D. students are supervised externally but perform their projects in connection with the Academy's project groups. This enables young scientists to come into contact with high-level scientists relevant to their Ph.D. projects. Apart from financial support awarded, the students have full access to the Academy's services.

Up to now the following projects have been supported by the Europäische Akademie: Karl-Michael Nigge worked on "Life Cycle Assessment of Natural Gas Vehicles"; the thesis was published in the Academy's book series "Wissenschaftsethik und Technikfolgenbeurteilung", Springer Verlag. Ulrich Rehberg works on "Integrative Nature Protection Demonstrated by an Example from the Densely Populated Area Koblenz-Neuwied, Germany" and will finish in 2002. Minou B. Friele writes her thesis on "The Justice of Supranational Law in Europe", Klaus-M. Seel works on "Explanatory Patterns in Theoretical Structures in Genetics".

Applications for the Ph.D. programme should be sent to the director of the Europäische Akademie.

The Newsletter reports about the results of the programme regularly.

PH/FW

Focus

Ethical Aspects of Technical Safety

Carl Friedrich Gethmann

Uncertainty and inequality are the most important phenomena that lead to the situation in which the modern technical age in contrast to the pre-modern technical phase gives rise to specifically moral problems which in the pre-modern era played only a marginal role or no role at all. So modern technically constituted societies must learn to develop from the initial perception of dangers to a rational risk assessment. In order to justify this ethical obligation the relation between danger and risk has to be discussed. In this context the concept of "pragmatic consistency" is introduced. The term „Safety“ is explicated as a comparative concept by means of the principle of pragmatic consistency.

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www.europaesche-akademie-aw.de

The partial systems of our society and its media in the fields of knowledge, art, language, law, the state etc. are shaped by our technically oriented life-world. They are not fulfilled entirely by this characteristic but without it they are inconceivable. Irrespective of whether we deplore or applaud this fact, we are living in a *technical culture*. No-one is capable of even imagining the price, in terms of quality of life in the comprehensive sense, that would have to be paid if one were to stray from this technical path in the direction of a pre-modern or post-modern, non-technically shaped form of life.

Technologically supported action bears witness to a far-reaching cultural historical dynamism of its own, thus begging the question with regard to technologically supported action as to the manner in which we wish to live and the way we should live. With this question, concerning preference and constraint, we are entering the realm of ethics, more preci-

sely the *ethics of technologically supported action*.

Now the human being has always been dependent on some kind of technical appliances, i.e. acting technically in order to ensure the desired quality of life or, indeed, even to survive. For a long time the appliances and devices of human activity occasioned no *specifically* moral problems. I should like to speak of a pre-modern technical phase, or of a pre-modern attitude towards technical devices. Modern technologically supported action and the modern attitude to it are determined by the problems of acting under conditions of uncertainty and inequality.

Uncertainty and inequality are the most important phenomena that lead to the situation in which the modern technical age in contrast to the pre-modern technical phase gives rise to specifically moral problems which in the pre-modern era played only a marginal role or no role at all. Is it permissible, in any case, to accept or even to expect others to accept the risk of a dangerous enterprise in the light of uncertainty regarding the achievement of the intended aims? And can one thrust danger in the path of others that have not freely chosen to ac-



cept it and who, with any degree of certainty, may not even reap any benefit from the ends intended?

Now the *concept of risk* has long been a proven instrument for the perception and description of dangerous situations, which based upon this are to be assessed and consequently overcome. It must be seen, however, that in many questions the perception of *dangers* on the part of members of our society on the one hand and the expert and professional assessment of *risks* on the other hand are widely at odds with each other, which, by the way, in some cases is due to a growing rationality in the manner of dealing with risks. In a certain way, we are faced with a paradoxical phenomenon: It is only after the advent of modern technology that it has first become possible to attain a high standard of safety, which former generations would not even have dared to formulate. The fact that in many cases this standard can be more or less satisfactorily met, however, also awakens new expectations regarding even higher safety standards.

In the interests of avoiding such a paradoxical situation, I should like to formulate a demand: *that modern technically constituted societies must learn to develop from the initial perception of dangers to a rational risk assessment, so that on the basis of this risk assessment they may formulate and describe their safety policy and safety technology.* This demand is ultimately an *ethical demand*. It requires a fundamental change in the way of behaving on the part of the members of a society. This demonstrates that acting under risk within the framework of a modern technical culture is the problem of a fundamental attitude of man towards his own actions in relation to his environment and to the world of which he is a part, a problem of the *ethics of actions threatened by risk*.

The treatment of ethical aspects in regard to this topic is new from several points of view. It is new from the point of view of the history of ethics and therefore, regrettably, there is little that we can expect to draw from the great treasure trove of this history in the way of wisdom that will aid us in gaining orientation. It is also new, however, from the point of view of decision-making theory, insurance mathematics or safety technology. Now it is this ethical aspect that I should especially like to highlight.

Now it all depends on a precise distinction being made between danger and risk or between the perception of danger and risk assessment respectively. The degree of risk in respect of an action is indeed not the same as the sub-

jective awareness of danger – whether individual or collective. Risk assessment is more a possible, many times proven instrument for coping with danger, namely it is the attempt to determine the quality of danger for a particular type of action independently of whether a given situation is perceived as more or less dangerous.

Comparing risks serves fundamentally to clarify the „degree of acceptability“ of the consequences of an action that one expects others (including oneself) to accept. In this connection it is very important to distinguish between the *acceptance* and the *acceptability* of risks. Regrettably in the debate set in motion by sociologists concerning the risk society there is again and again a confusing mixture of concepts. By risk acceptance is meant the factual, possibly empirical, socio-scientifically describable willingness of an individual or a group to understand, to perform or to permit an action which under some circumstances may give rise to dangerous consequences. For a rational risk assessment we need the term *acceptability* as a term which can be contrasted with the term *acceptance*, i.e. we need standards and norms upon the fulfillment of which it will be made to depend whether a certain presumption is reliable or not.

Now there is some doubt as to whether such acceptability criteria exist at all, and one of the decisive reasons for the current aversion to technical things and for the sceptical attitude towards technology lies in the fact that many people believe that there is no such thing as acceptability criteria related to risks and chances. Such a generally sceptical view is not by any means widely shared in our daily life, for example, otherwise we would not indulge in most of the comparisons we make in regard to the different options for our actions. However, it must also be conceded that we may not expect to find acceptability criteria that would allow us to *categorically* prescribe certain courses of action. This would be an illusion. This illusion, however, is often cited for polemic purposes in order to demonstrate in general the pointlessness of any attempt to formulate acceptability criteria. In all of this, the fact is ignored that it is indeed possible to formulate *hypothetical* imperatives whereby in nearly all questions on how to act hypothetical imperatives are sufficient for the purpose of establishing an orientational basis. The formulation of such hypothetical prescriptions for action is in principle possible without further ado and in the everyday world, in science and technology we make constant use of this possibility. Prescriptions

of this nature, however, are only justifiable if the individual for himself and society as a whole is prepared to recognise and presuppose a principle that I have called *the principle of pragmatic consistency*. It says that if you are prepared to accept one kind of risk then you must also be prepared to accept an other risk (in the same risk category) which is smaller or at most of equal magnitude (the benefit is initially equated as a *ceteris-paribus* condition). This principle demands that everyone should strive to be consistent in his mode of action.

On the basis of the principle of pragmatic consistency it is possible to make a contribution to substantiating the term „safety“, which is gaining ever increasing importance in the discussion about modern technology. Here, however, the frequent use of the word involving the presupposition that "safety" can be defined as equivalent to trouble-free or accident-free must be rejected, for a course of action may very well be factually trouble-free or accident-free and yet still involve high risk. Safety is first and foremost a *normative* term namely in the way that the state of affairs to which it refers are comparatively well ordered. For this reason one should begin characterising the meaning of "safety" by examining the conditions under which something is safer than something else. If we once presuppose that something is safer than something else when it bears less risk, then the suggested explication of the concept of „risk“ should also contribute to clarifying more precisely the concept of „safety“.

Without being able to justify each one individually at this point, the following *four postulations* seem suitable and sufficient for the explication of the principle of pragmatic consistency in order to define the concept of safety.

a) the postulation of limitability: „Reject those actions whose scope of consequences is principally illimitable!“

Logically it should be easy to accept the idea that a principally illimitable scope of consequences resulting from an action will principally always involve limitless danger thus rendering it imperative to reject such a course of action. This is the guiding principle which still requires some clarification. Three further postulations shall serve to clarify questions of this sort as follows:

b) the postulation of "surveyability" (Überschaubarkeit): „Given the choice of two possibilities for action, select the one that has the smaller scope of consequences (with the same chances)!“

In order to determine the consequences of our actions it is necessary to possess

a certain level of knowledge. We must know the causalities or at least the circumstantial conditions that exist or do not exist pertaining to the consequences of our actions. And this can only be achieved if the sciences provide us with a corresponding reconstruction of the causalities involved. Thus from the postulation of surveyability it immediately follows that there is something like a corresponding *call for research*.

c) the postulation of controllability:

„Given the choice of two possible actions each with an observable scope of consequences select the one whose consequences are more easily controllable!“

In this case we are referring to technical controllability, i.e. it is a matter of enabling those risks that are possibly caused by technical implementation to be controlled by technical means.

d) the postulation of reversibility:

„Given the choice of two actions each with an observable and controllable scope of consequences choose the one whose consequences can be more easily or more quickly revised up to and including the possibility to restore the status quo ante!“

I now propose that one course of action be regarded as safer than another when it fulfils the criteria (a)-(d) above. This understanding of „safety“ results in the conclusion that the comparative relation implicit in the safety criteria must always be made clear. „Making something safer“ tends to be an endless task. There is no such thing as *the safe condition*. Every step towards greater safety must be examined in the framework of risk comparison as to whether the costs involved in a specific case could not be used more effectively somewhere else. After all, our possibilities to act depend on the state of the art of scientific and technological development: anyone who wants more safety has to invest more in scientific research and technological development.

This contribution is a summary of the author's lecture "Ethical Aspects of technical safety" given at the World Congress "Safety of Modern Technical Systems" (Saarbrücken 12.-14.9.01) on 12.9.91 (published in the Congress-Documentation, Saarbrücken 2001, pp. 45-55).

The author is director of the Europäische Akademie GmbH and Full Professor for Applied Philosophy at the Universität Essen.

Working groups

Climate Prediction and Precautions

On October 2 2001 the Scientific Advisory Board of the Europäische Akademie accepted the final report of the pro-

ject group with minor suggestions, which have been recently considered. The Federal Ministry for Research and Education (BMBF) stated its interest in the study results. The publication within the series "Wissenschaftsethik und Technikfolgenbeurteilung" (Springer Verlag) can be expected in early 2002.

Chair: Professor Dr Meinhard Schröder (University of Trier)

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Embryo Experimentation in Europe

The fourth meeting of the project group took place on 20th and 21st October in Bad Neuenahr-Ahrweiler. As a guest Professor 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. Dr Ulrich Martin, also guest-speaker, talked about embryonic stem cells and therapeutic cloning; relevance for transplantation medicine.

Chair: Professor Dr Davor Solter (MPI for Immunobiology, Freiburg)

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Functional Foods

The project group Functional Foods has met in Florence, Italy, following the third international congress of the European Society for Agricultural and Food Ethics titled "Food Safety Quality and Food Ethics". Professor Chadwick and Dr Liakopoulos presented the work of the project group at the congress and reported the audience's feedback to the rest of the group. The next meeting will take place in Karlsruhe, Germany, on 7th and 8th December at the Federal Institute for Nutrition Research where the group will discuss with invited speakers from industry.

Chair: Professor Ruth Chadwick (Lancaster University, UK)

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Robotics. Options for the Substitutability of Humans

The project group presented and discussed the results of its work at the workshop "Where will autonomous robots go to?" at the international conference on artificial intelligence on September 18 2001 in Vienna. After an introduction the overall results of the project group were presented. The second

part of the workshop dealt with ethical reflections.

Chair: Professor Dr Thomas Christaller (Fraunhofer Institute AIS, Sankt Augustin)
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Sustainable Development and Innovation in the Energy Sector

The project group's mid-term workshop took place November 9 2001 in Ahrweiler. A first draft of the report was reviewed by the following external experts: Professor Dr Dr Brigitte Falkenburg (Universität Dortmund), Professor Dr Wilhelm Althammer (Handelshochschule Leipzig), Dr Gerd Eisenbeiß (Forschungszentrum Jülich), PD Dr Volker Radke (Berufssakademie Ravensburg), Dr Klaus Rennings (ZEW, Mannheim), Dr Herwig Unerstall (Universität Leipzig), Professor Dr Alfred Voß (Universität Stuttgart).

The general structure of the report was unanimously supported. Starting from a specific terminological setup concerning the basic concepts of sustainability, innovation and energy as well as related concepts the goals and a benchmark for the group's recommendations are determined. The technological potentials are then specified along the lines of different scenarios relevant for the development of the European energy system. Following the analysis of pertinent target conflicts the strategic options are identified leading to a particular set of policies recommended by the project group.

Chair: Professor Dr rer. pol. Ulrich Steger (IMD Lausanne)

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Conferences

Frühjahrstagung 2002: Nachhaltige Entwicklung und Innovation. Globale Perspektiven wirtschaftlichen Handelns

Vom 13. bis 15. März 2002 findet die Frühjahrstagung der Europäischen Akademie zum Thema „Nachhaltige Entwicklung und Innovation. Globale Perspektiven wirtschaftlichen Handelns“ in Bad Neuenahr-Ahrweiler statt. Schwerpunkt der Tagung ist der Dialog zwischen Experten aus Wissenschaft und Wirtschaft (BASF AG, E.ON Energie AG und der Vaillant AG). Anmeldungen und Anfragen bitte an: Europäische Akademie, Tel. 0 26 41-973 300, Fax 0 26 41-973 302, e-mail: europaeische.akademie@dlr.de, oder auf der Homepage www.europaeische-akademie-aw.de.

Book Series

The 12th volume of the Europäische Akademie's book series "Wissenschaftsethik und Technikfolgenbeurteilung" was published recently:

C. J. Langenbach, O. Ulrich: *Elektronische Signaturen. Kulturelle Rahmenbedingungen einer technischen Entwicklung*. Reihe Wissenschaftsethik und Technikfolgenbeurteilung, Band 12, Springer Verlag, Berlin 2002, ISBN 3-540-42659-0

Lectures

Michael Decker:

26.9.01 "Robotik. Optionen der Ersetzbarkeit des Menschen", Tagung "Informatik 2001", Wien

18.10.01 "Cost-Benefit-Analysis of Telemedicine. First Steps to an Interdisciplinary Technology Assessment", Innovations for an e-Society, Challenges for technology Assessment, Berlin
7.11.01 "Robotik. Perspektiven menschlichen Handelns in der zukünftigen Gesellschaft", Workshop "Ethik und Forschung", Vertretung Rheinland-Pfalz, Brüssel

9.11.01 "Roboter. Wird der Mensch bald ersetzt? Eine rationale Technikfolgenbeurteilung", Tourbot-Projekt Deutsches Museum Bonn

Minou Bernadette Friele:

26.10.01 Lernwerkstatt Bioethik: "Experten lernen von Laien", Bildungszentrum des deutschen Beamtenbundes, Königswinter

Carl Friedrich Gethmann:

12.9.01 "Ethical Aspects of technical safety", World Congress "Safety of Modern Technical Systems", Saarbrücken 12.-14.9.01

24.09.01 "Ethische Probleme der Forschung an embryonalen Stammzellen", BioEthik-Kommission des Landes Rheinland-Pfalz, Mainz

16.10.01 "Ethische und gesellschaftliche Aspekte aktueller Fragen der Bioethik", Symposium des Landtages des Landes Rheinland-Pfalz, Mainz

25.10.01 "Professionelle Ethik und Bürgermoral. Zur gegenwärtigen Debatte um die BioPolitik", Schloß Waldthausen, Sparkassen- und Giroverband Rheinland-Pfalz

07.11.01 "Ethik und Forschung am Beispiel der Forschung an embryonalen Stammzellen", Diskussion in der Vertretung des Landes Rheinland-Pfalz, Brüssel

22.11.01 "Ethische Aspekte technischer Sicherheit", Herbsttagung der Europäischen Akademie GmbH "Sicherheit und Autonomie in der Informationsgesellschaft", Bad Neuenahr

29.11.01 "Ethische Probleme der Gentechnik", Arbeitsgruppe Gentechnologiebericht der Berlin-Brandenburgischen Akademie der Wissenschaften

13.12.01 "Die Aufgabe der professionellen Ethik in der Diskussion um die Biopolitik", Studium Generale an der Universität Kaiserslautern

Gerd Hanekamp:

28.10.01 "Ethische Fragen an die moderne Naturwissenschaft", Fachkolloquium des Tönnisteiner Kreises, Maria Laach

15.11.01 "Scientific Political Consulting and Participation", Universität Macerata

Christian J. Langenbach:

17.-19.10.01 "Electronic Signatures – How Future Needs Affect Today's Decisions", Congress "Innovations for an e-Society. Challenges for Technology Assessment, Berlin

Jeantine Lunshof:

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

10.10.01 "Sterbehilfe versus Hospizbewegung", Podiumsdiskussion Hospiz-Forum, Hospiz an der Lutter, Göttingen

13.10.01 "Ethische Aspekte der pränatalen Diagnostik", Fortbildungsveranstaltung für Hebammen: "Guter Hoffnung sein... Aktuelle medizinische und ethische Aspekte der pränatalen Diagnostik", Zentrum für Ethik in der Medizin am Markus-Krankenhaus, Frankfurt a.M.

7.11.01 "Sterbehilfe – Wann wird der Mediziner zum Täter?", Podiumsdiskussion 10. Hallesche Tage des Rechts 2001, Ministerium der Justiz des Landes Sachsen-Anhalt und Juristische Fakultät der Universität Halle-Wittenberg, Halle

New Publications

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

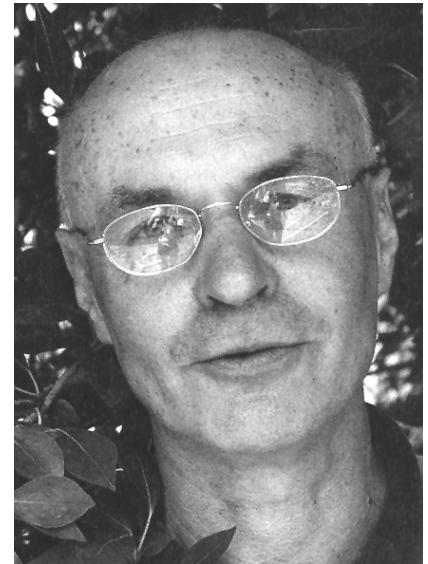
C. F. Gethmann: "Ethical Aspects of Technical Safety", in: World Congress on Safety of Modern Technical Systems. Congress-Documentation, Saarbrücken 2001, 45-55

C. F. Gethmann: "Ethical Aspects of Long-term Responsibilities in Research", in: N. J. Smelser / P. Baltes (eds.) *International Encyclopedia of The Social and Behavioral Sciences*, Oxford 2001, Band 19, 13227-13231

C. J. Langenbach, O. Ulrich (Hrsg.): "Elektronische Signaturen. Kulturelle Rahmenbedingungen einer technischen Entwicklung". Reihe Wissenschaftsethik und Technikfolgenbeurteilung, Band 12, Springer-Verlag, Berlin 2002

J. Lunshof: "Selbstbestimmung: Ein theoretisches Konzept und seine Bedeutung in der Praxis", in: Bund Deutscher Hebammen e.V. (Hrsg.), *Gebären zwischen Selbstbestimmung und gesellschaftlicher Kontrolle*, Kongressband 9. Hebammenkongress, Karlsruhe 2001

Personalities



Jacek Hołowka is professor of philosophy at Warsaw University in Poland. He teaches contemporary analytic philosophy and conducts various seminars in moral philosophy at his department. He is also Editor-in-Chief of the *Przegląd Filozoficzny*, a leading Polish journal in the field. Professor Hołowka's interests in medical issues go back to mid seventies, when he was a member of a committee organized by the Academy of Sciences and commissioned to formulate more efficient policies of social adaptation of the disabled. In the eighties he was chairperson in the Section of Philosophy at the Medical Academy in Warsaw. The job gave him more experience with normative problems of medicine. He is on the Board of Directors of the Fundacja Zdrowie, a private organization that provides basic medical services to inhabitants of Warsaw and conducts research and training in health care organization. Hołowka is also working together with professors in law and in sociology to organize a post-doctoral program in medical law and bioethics at Warsaw University. His basic career has been however in philosophy and not in medical philosophy. He taught abroad at Indiana University (Philosophy) and at Notre Dame University (Liberal Studies). For one semester he was invited to give courses on contemporary philosophy at the Viadrina University, and he holds the title of Europaprofessor from that university.

Jacek Hołowka is member of the European Academy's project group "Embryo Experimentation in Europe".

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