

ALLEA

Annual Report 2005

Colophon

ALLEA - is the Federation of 52 Academies of Arts and Sciences in 39 European countries

ALLEA - advises her member academies, acts as a platform for her members and offers advises in the fields of science and science policy

ALLEA - strongly supports ethic ways of dealing with science, science policy and public policy in general.

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Preface

In line with the meanwhile established tradition to publish every even year an elaborated Yearbook, and every odd year a more modest 'Annual Report', we present herewith the Annual Report 2005.

In previous years the yearbooks and reports comprised all the papers and addresses published and/or presented by ALLEA's President and staff. During the year 2005 quite a few papers have been produced and presented again that could qualify. However, it is the intention to publish a book with the President's most salient presentations during his presidency in the years 2000 – 2006 at the occasion of his retirement in Krakow on March 24, 2006, and the publications that will be incorporated in this book will not be reproduced in this Report. The present Report encompasses the paper given in Warsaw at a conference of the Ministry of Science, the Ministry of Health and the Polish Academy of Sciences on June 3 with the title *Responsible conduct in science*, the address presented at the Regional Baltic Conference in Helsinki on June 10 and at the Bulgarian Academy of Sciences in Sofia on Sept. 8 under the title *Scientific collaboration and the 7th Framework Programme*, and the presentation in Zagreb at the Assembly meeting of the World Academy of Art and Science on Nov. 20 titled *Europe as a knowledge society*. These papers will be followed by a report of the Chairman of the working group on 'Privacy and the information society', which has taken the shape of a scholarly article on the *Cybernetic Revolution*.

The second section on activities and communication first lists the President's and ALLEA's activities and representations during the year 2005. But the pièce de résistance of this section is the extensive reaction of ALLEA on the proposals for the Seventh Framework Programme 2007-2013 of the European Commission under the title *Investing in knowledge in Europe*. This reflection resulted from an extensive consultation with ALLEA's Steering Committee and Member Academies and represents a wide consensus within ALLEA's membership.

In the third section an updated list of ALLEA's Member academies and the present composition of the Steering Committee and the Standing Committees is rendered.

We hope the reader finds the information useful and the views expressed in the different contributions of interest.

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Section I
Papers and Presentations

Scientific Integrity and Social Responsibility: The Role of Academies of Sciences

Pieter J.D. Drenth *

Trust in science

Trust is the most important pillar on which science rests. Colleagues should be able to rely on the honesty of a researcher; honesty in describing the phenomena (s)he observes, in reporting how these have been analysed and interpreted, and in proper referring to other publications in the field. This applies also - and perhaps more so - to society in general. Users and interested parties (clients, patients, businesses, and social institutions) are far less able to verify the correctness and the quality of the conclusions and insights that the researcher presents than fellow researchers. If other scientists and the public at large can no longer give this trust, this would sooner or later mean the end of the usefulness and relevance of science.

How does science currently fare in respect of trust and acceptability? The latest results of the Eurobarometer (2005), a European survey of attitudes and opinions, showed a disturbing finding: many Europeans consider themselves poorly informed on issues concerning science and technology, resulting, as is suggested, in a more sceptical perception of science and technology. This is particularly found among women, older people and those with a lower level of education. Many people express even fear of scientists, whose high degree of knowledge may make them too powerful. They also harbour concern that scientific research could cross ethical boundaries, which is difficult to control. At the same time they want scientists to work freely without the fear of risks and potential dangers slowing them down, since they believe that scientific progress will be beneficial for their present and future life.

Here we encounter the well known paradox (see also Drenth, 1999): On the one hand people expect science to solve most of the current and future problems and to improve their living conditions. There is much -

* Presented at the World Science Forum 'Knowledge, Ethics and Responsibility' in Budapest, Hungary, 10 November 2005

even to the point of irresponsible - trust in science. Damage to the ozone layer? depletion of fossil energy? reduction of the biodiversity? illnesses as a result of smoking, drinking, unsafe sex.....? Science will present a solution, is often the carelessness incurring, but misplaced optimistic thought.

On the other hand, we also encounter an increasing scepticism. This manifests itself in the increasing interest that various pseudo-scientific theories, such as astrology, psychokinetics, neurolinguistic programming and telepathy enjoy, as well as in the growing popularity of unscientific, sometimes occult, practices such as reincarnation therapy, homeopathy, laying on of hands and hypnosis. Alarming, paranormal observations of UFOs, aliens and extra-terrestrials, corn circle makers and voices of the dead, too, are taken seriously by many. Even anti-scientific sounds are only too often heard from newspapers and other media, with scientific researchers being depicted as sly Mephistos or Frankensteins who eagerly and disrespectfully tinker with the secrets of life through their cloning or genetic manipulation.

Many of these negative attitudes and sentiments are fed, in part, by fear; fear of a lack of control over the possible effects of scientific developments: nuclear waste, environmental deprivation, the horrific consequences of genetic modification, emerging dangerous viruses and bacteria, loss of liberty and privacy through ICT developments, and fear, perhaps also, of a dominant scientism and secularisation, and deprivation of religion and spirituality.

Not all criticism is objectionable. Some of the captious questions posed to present day scientists are amenable to reason and need careful attention. Are scientists always aware of the potential and/or ethical consequences of their research, especially when this is applied and used by others? Are scientific practitioners capable of judiciously dealing with new-found knowledge? Have scientists sufficiently freed themselves of unwanted intrusion of influence? Have they protected research subjects against the infliction of unacceptable harm and exposure to unacceptable risks? Questions and criticisms like these cannot be arrogantly ignored by science. If not given serious attention, they may erode the axiomatic quality of science and even pose a threat to science as an intellectual endeavour. Moreover, since these attitudes may influence the general public, they may also have an unfortunate effect on the willingness of political leaders to reserve the necessary funds for innovative and frontier research. It goes without saying that public

opinion, the sentiments of voters and the tone of the media debate largely determine the boundaries imposed on scientific practice at the beginning of the 21st century. And, as said, these sentiments are unmistakably more sceptical and negative than in the past.

Academies of sciences and humanities and other scientific organisations and agencies have to give this issue of public opinions and sentiments with respect to the impact and societal consequences of science and technology a higher priority than they have done in the past. Fortunately we see various signs that these insights start to break through. For instance, the European Commission, in its proposals for FP7, intends to further public awareness through the dissemination of scientific information, an honest dialogue with the general public, the promoting of a scientific and educational culture in Europe, and placing responsible science at the centre of policy making. These actions are considered to have a high Community added value and to be important stimuli for the greater acceptance of science by society.

The FP7 proposal envisages 'Science in Society' actions taking place along three lines: (1) the embedding of the theme throughout the 7th Framework Programme (through the introduction of social/ethical themes and communication strategies in the content and operation of the FP's various components), (2) defining of and focussing on a number of core themes at the interface of science and ethics, and (3) the co-ordination of national programmes and policies tailored to social/ethical issues in science and technology.

ALLEA considers this a fruitful and effective approach. It particularly wants to emphasise the importance of embedding a social/ethical view in regular projects and programmes. The objectives of ensuring public confidence in European research and its applications, of strengthening the scientific workforce and providing better career opportunities in science, and of developing trust in and appreciation of science through various policy-related initiatives and well monitored communication can best be achieved through the integration of 'science in society' throughout the 7th Framework Programme, and not (only) by focussing on underpinning research with a dedicated budget, although the latter can, of course, be ill spared. ALLEA welcomes the over-proportional increment of the budget reserved for this purpose. Given the projected ambitions and the growing importance of science and society's new partnership in Europe, it considers this development fully justified.

Communication

It is here that insufficient and unfair communication about research and its results come home to roost. Important is here the honest and fair communication about results of scientific research. Some researchers focus too emphatically on the policy and practical implementations of their research, also when this is not warranted. Other scientists give their opinion on political and social issues wrongfully suggesting that their words have a scientific justification; there may not be empirical evidence available or not at their disposal (for instance, because it is not their field of expertise). Again others claim too much success and promise too quick results, in order to acquire financial support for their research, to get public honour, or to secure an appointment or promotion. Sometimes the public is simply misled for political reasons: the general and unjustified resistance against genetically modified food, or against nuclear fission are cases in point. Scientists should never let themselves be misused for political purposes. It can be defended that wrong communication about research is always harmful. It creates too much hope (particularly in medical research), and sometimes unjust fear (technological and information developments). And, if the research results fall short and fail to accede the claims, they boomerang for science in general.

There is another problem that has to be discussed with respect to the communication of scientific results to the general public and decision-makers. With respect to many and often pressing questions and problems in society much of our knowledge is probabilistic, uncertain and contingent, because of either *ontic* (really existing in the world out there) or *epistemic* (insufficient and lacking knowledge) uncertainties or both. And it is a serious mistake to communicate this 'probabilistic' knowledge to the public and to policy makers as if we were certain about the insights and conclusions. We see the negative effects if we do: confusion and suspicion at the cost of the credibility of scientific research.

On the other hand it is sometimes also reprehensible for the researchers to duck away from their responsibility and to indulge in their almost natural inclination to refrain from speaking while waiting for more conclusive evidence. Sometimes inaction is not neutral and risk-free at all. This is certainly true if we deal with irreversible effects, such as mergers of organizations, promising but risky investments, environ-

mental problems such as global warming, the effects of CO₂ emission, etc. In other words, decision-making based on educated guesses and 'precise imprecision' is sometimes better than decision making by default or not at all.

Anyway, it has become clear that scientists must develop abilities to communicate their findings and ideas with policy makers at all levels and with the public at large. The public needs to be informed how and why their taxes are being spent. As a recent ESF report (2003) states: "Given that the public sector is the principal sponsor of research there is an increasing onus on all of us to devote more time to explaining, listening and debating". This issue is also of great concern to Academies of Sciences and Humanities, and, for that matter, for associations of such academies, like All European Academies (ALLEA). ALLEA has, therefore, created a Working Group on 'Science and the Media' with the task to advise ALLEA and its member Academies on the question how to deal with this increasingly important aspect of the work of scientists and scholars: the proper communication with the general public through the various types of media, each with its own singularity and each requiring a specific approach.

It would be, however, too easy and deficient, to interpret all ethics issues in science in terms of (mis)communication. There are substantial problems related to the essence of the scientific endeavour or to the integrity of the scientist. Let us have a further look into the nature of the connection between science and ethics.

External social/ethical problems in science

In an earlier publication, I made the distinction between external and internal social/ethical problems (Drenth, 2002). The former category refers to questions of the social/ethical context as well as the consequences of scientific research. Questions such as the following arise:

- What is the justification for the choice of a research topic? Is what we intend to investigate, worth knowing? This question is a matter of the researcher's personal preference and values, but, as said, in many cases also of importance to the taxpayers or sponsors.
- Is the scientific research truly independent of sponsors, employers, clients or other interested parties? We know that scientific research should be independent and free from any external pressure or influence.

But all too often - and this is especially true for sponsored or contract research - there is an overriding temptation to avoid biting the hand that feeds.

- To what extent is the researcher responsible for what is done with the results? Research results can be used for better or for worse. They can turn into a blessing for individuals or society, but there are also many cases in which researchers sadly observe their research being abused by colleagues, practitioners, or the media.

- Are there cases in which ethical objections to certain implications of research, or certain consequences of new insights are becoming too strong? Sometimes scientific and technological developments' progression is faster than the reflection required on their societal and moral implications. In the medical field cloning, genetic cancer research, embryonic stem cell research, xenotransplantation and others are cases in point.

An interesting question is whether governments or science organisations (funding agencies or academies) should opt for 'no go' decisions with respect to certain subjects or fields of investigation. In discussing the constraints to be imposed on science, I would like to assert that in general it would be inappropriate to refrain from doing research for fear that it might be abused or be irresponsibly applied. This would almost certainly mean the end of all research, because nearly all scientific results are, in principle, open to wilful abuse. An additional problem related to constraining research on the grounds of potentially undesirable or dangerous consequences, is that such consequences are not always easy to foresee, especially in fundamental and innovative research. After all, one of the characteristic features of such research is that its results cannot be predicted or charted beforehand. Surprise is typical of creativity and serendipity.

It is further important to realise that any discussion of the constraints to be imposed on research is fraught with danger. History abounds with examples (Galileo, More, Spinoza, Lysenko) of science having been repressed because its research results did not find favour with the ruling ideologists, or did not serve the economic or political authorities' interests, or were opposed to the interests of (sometimes wholly respectable) movements and action groups, such as feminism, the anti-discrimination movement, environmental activists, and the freedom movement.

Of course, there are cases for which 'no go' decisions would be regarded incontestable by all scientists and scholars. Cases in which unacceptable damage is inflicted upon the object of research (people, animals, nature, culture), or cases in which the nature or consequences of the research would be in conflict with basic human values (including human dignity, informed consent, human rights, equality and non-discrimination)

Maybe more room has to be made for 'slow go' decisions. These would apply in cases where scientific or technological developments are out of step with the ethical reflection on their impact and consequences. The research could be temporarily suspended until the ethical implications have been subjected to public discussion, and reasonable consensus is reached (see McLaren, 1999).

Internal ethical problems

Internal ethical problems all refer to scientists' improper behaviour. This category encompasses:

- improper or imprudent behaviour with respect to subjects of experimentation, such as the insufficient protection of privacy or anonymity, neglecting to obtain informed consent, discrimination, improper treatment of experimental animals etc.
- improper dealing with the general public and the media, including too positive and too optimistic reporting of research results, which would create too much unjustified hope, especially in medical research;
- disregarding rules of 'good practice', such as undeserved authorship, improper citation, no sequence of authors according to contribution, or alphabetical order if contributions are equal, violating the rule to avoid conflict of interests (in a review task for publication or subsidy) etc.
- manipulation of data or interpretation, including fraud (fabrication or falsification of data), deceit (deliberate violation of methodological requirements (sampling, statistical techniques) so as to create a false confirmation of hypotheses, or otherwise biased results), and
- infringement of intellectual property rights, such as plagiarism, or pinching of a colleague's discovery, or a student's idea.

Of course, not all violations are equally serious. The manipulation of data is the most severe of these violations, but there is also variance within the categories. Fabrication of data is more serious than 'rounding

off', or making use of a too small sample, while plagiarising substantial pieces of text is more reprehensible than pinching an idea from a conversation between colleagues.

Hard data on the occurrence of misconduct are rare and also difficult to obtain. Part of the problem is that it is not always easy to draw a clear line between unacceptable and (still somewhat) acceptable behaviour. Where lies the boundary between experimental 'proof' based on a too small sample and the illustration of an argument with 'case' data? Or between plagiarism and careless citation? Was an incorrect, but 'favourable', statistical technique truly chosen deliberately? Is it selective use of evidence, or a different methodology, or even another paradigm?

The number of reported cases in scientific and public media is, however, growing, and for instance *Nature* has revealed a alarming number of cases of misconduct in the last few years. 'Fraud booms worldwide' headlines *Times Higher* 5 August 2005. And even more disturbing is the fear that far more fiddling with research data occurs unnoticed, a fear that does not, unfortunately, seem unfounded. Three years ago, an issue of *Nature* (vol. 418, 8 August 2002) discussed a report that the American Institute of Medicine (IOM) had just released and that specifically dealt with scientific integrity and scientific misconduct. The IOM also noted that fully-fledged cases of scientific misconduct are rare, but that smaller lapses often go unnoticed: fudging a control here, deleting a messy data point there. But the IOM warned that what might appear to be minor violations of integrity, will have bad long-term consequences. It called for research institutions to take a more active role in creating an environment in which misconduct will not occur.

Causes of misconduct include pressure from powerful institutions or persons (governmental or church leaders), economic and financial motives (lending an ear to industrial sponsors, the risks associated with contract research), and the scientists or scholars' ambitions and vanity. Given the pressure on researchers to produce publishable output and to show (preferably spectacular) results, a present-day growth of misconduct is certainly more than likely.

As far as the prevention of misconduct is concerned, one may consider corrective measures (punitive measures, sanctions), or preventive measures (procedures, regulations, precepts, whistleblowers,

ombuds-persons), but most important is the development and fostering of a scientific conscience, and a proper sense of values and standards.

What role do Academies play

What role could academies of sciences and humanities and umbrella academy organisations, such as the All European Academies, play in this matter? After all, academies have an important advisory role. Moreover, the ethical issues in general, and most certainly the problems concerning scientific misconduct, are of real concern to the academies. Also the ESF envisaged an important role for academies in the formulation of scientific codes and in initiating the discussions on good scientific practice (ESF, 2002).

At ALLEA's General Assembly in Prague in 2000, I reported on a modest survey of ALLEA members that addressed these problems. Four questions were asked: Is scientific misconduct a serious and growing problem in your country? Is there a formal procedure or protocol to deal with these problems in your country (the role of the Academy)? Is there a need for a prescriptive code of ethical conduct, or good manners in science? What role could ALLEA play in these matters?

The reactions varied, but in general scientific misconduct was seen as a growing concern. Often there was no official procedure or protocol, and the leadership of the relevant institute handled the matter. Sometimes academies were involved in an advisory or evaluative capacity. The general reaction to the question on the need for a code of conduct was affirmative; in certain cases such a code was already available. Almost all ALLEA members (with the exception of one or two who only acknowledge the problem as a country-specific matter and not a universal one) welcomed the idea of ALLEA taking some initiative or role in the further development or promotion of a 'code for good manners in science' in Europe.

Many academies have already developed such a prescriptive set of rules, a code of conduct and/or a procedure for handling reported cases of misconduct. The NAS publication *On being a scientist* (1995, 2nd ed.) is both well known and well written. In 1998, the *Deutsche Forschungsgemeinschaft* issued Proposals for safeguarding good scientific practice as a reaction to a disturbing case of collective fraud.

In December 2000, the European Science Foundation issued a policy briefing on this issue under the title Good scientific practice in research and scholarship in which, among others, it was recommended that:

- National academies should draw up national codes of good scientific practice in research and scholarship where these do not yet exist; and
- National academies should initiate discussions on the most appropriate national approach to procedures for investigating allegations of scientific misconduct, whether by means of an independent national body, formal procedures at each university and research institution, or by other means.

It should be clear that this does not only concern purely national problems, although culture and traditions, as well as legislation may have an influence on the way these problems are handled in practice. The issues in question are, however, generic and universal, and also need an international approach. This is why I have urged (intermediate) international Associations of Academies, such as ALLEA, USNAS, the Federation of Asian Scientific Academies of Science, the African Academy of Science and others to become actively involved in the co-ordination of the various approaches undertaken nationally in co-operation with world-wide organisations such as IAP, ICSU, TWAS and UNESCO. In fact, they can play a role by specifically:

- placing the issue of misconduct on the agenda;
- providing individual national academies with information and advice,
- co-ordinating national activities internationally with a view to alignment around common principles (although not disregarding differences of opinions and legal traditions between states), and
- dealing with misconduct in international research projects.

In this vein, ALLEA has tried to take up responsibility for the co-ordination at a European level, without this implying that uniform rules and procedures need to be developed for all European countries. ALLEA (2003) adapted a recommendation by the Royal Netherlands Academy of Arts and Sciences (*Notitie wetenschappelijke integriteit*, KNAW, 2001), translated it into English and has offered this *Memorandum on Scientific Integrity* for the perusal of all ALLEA's member academies. This Memorandum urges the founding of a National Committee for Scientific Integrity (NCSI) that can serve as an advisory board, or a science court of appeal when the (primarily responsible) institute or university's settlement in respect of the violation of scientific integrity is found to be unacceptable to one of the relevant parties.

In The Netherlands, such a body (LOWI) has been founded by the Royal Academy in close consultation with the National Science Foundation (NWO) and the Association of Universities (VSNU). It is not ALLEA's intention to have other European countries copy this formula exactly, but by offering this model, it aims to stimulate the discussion on the most desirable approach and to point out the potential helpful role that Academies of Science could play. Furthermore, it aims, if possible, to co-ordinate a European approach to the phenomenon of scientific misconduct that can be so detrimental to science.

References

- ALLEA, KNAW, NWO, VSNU, (2003). *Memorandum on scientific integrity*. Amsterdam: ALLEA/KNAW.
- Drenth, P.J.D. (1999). Science where do we draw the line? *European Review*, 7, 239-246.
- Drenth, P.J.D. (2002). International science and fair-play practices. *Science and Engineering Ethics*, 8, 5-11.
- Eurobarometer Reports* (2005). http://europa.eu.int/comm/public_opinion/index_en.htm
- European Science Foundation (2002). *Good scientific practice in research and scholarship*. ESF Policy Briefing.
- Koninklijke Nederlandse Akademie van Wetenschappen, Verenigde Samenwerkende Nederlandse Universiteiten, Nederlandse Organisatie van Wetenschappelijk Onderzoek (2001). *Notitie wetenschappelijke integriteit: over normen van wetenschappelijk onderzoek en een Landelijk Orgaan voor Wetenschappelijke Integriteit*. Amsterdam: KNAW.
- McLaren, A. (1999). The ethical dilemma: The living world. In P.J.D. Drenth, J.E. Fenstad & J.D. Schiereck (Eds), *European science and scientists between freedom and responsibility* (pp. 101-107). Luxembourg: Office for Official Publications of the European Communities
- National Academy of Sciences, National Academy of Engineering, Institute of Medicine (1995). *On being a scientist; responsible conduct in research*. Washington D.C.: Nat. Ac. Press.

The Cybernetic Revolution: The Law in a Turmoil

*François Rigaux**

The Cybernetic Revolution

Next to some big political events, some of which are called 'revolution' – the Glorious Revolution of 1688, the American Revolution, the French Revolution, the Civil War, the defeat of the Third Reich – which convulsed state institutions and paved the way for new kinds of relationships among peoples and between human beings – constitutionalism, international law, a universal protection of human rights – other changes in the social fabric have also brought about turmoils which can equally be called revolutionary. The industrial revolution¹ is a first example, followed by the thermodynamic revolution, the graphic revolution² and, finally, the cybernetic revolution.

Jean Ladrière's competence in the philosophy of science has inspired him to link three successive periods in the evolution of machines with a corresponding brand of philosophical thought. The first epoch deals with mechanical machines, apt to transmit or to enlarge the force applied on one point. Such are the lever, the crane, the winch, the siege machines of Antiquity, as, also, the machines with a regular movement, for instance the clocks. The corresponding metaphysics can be found in the rationalist theodicies for which God is the big clock-maker of the universe. The mechanical machines are followed by those which are apt to transform one kind of energy into another and to make good use of the natural energies. The principles of thermodynamics are brought to action: the steam engine, the internal combustion engine, power-houses, electricity works belong to that family and gave rise to various forms of energetics and to the theory of evolution. While the machines of the two first generations prolong the

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¹ See for instance: Michel Serres, *Feux et signaux de brume Zola* (Grasset, 1975), p. 210, 233, 266, 282.

² See Daniel J. Boorstin, *The Image or what happened to the American Dream* (French transl. by Jeanine Claude, Julliard, 1963), p. 25-26, 100, 151-166, 178.

muscular system, a third family of machines does amplify the nervous system.³ Such machines have a scope, they can be deemed 'intelligent', because they use information.

The thermodynamic revolution is already linked with cybernetics. Rudolf Clausius (1822-1888) did state two principles:

Die Energie der Welt ist konstant.
*Die Entropie der Welt strebt einem Maximum zu.*⁴

The second law of thermodynamics, or entropy, entails the dissipation of energy which, should it not be counterpoised, would bring the world to chaos.

In the physical world, events are predictable from the second law of thermodynamics: water runs downhill, warm bodies cool, the sugar cube dissolves in my coffee, things fall apart. Living organisms by contrast, are active: they climb the stairs, generate heat, accumulate nutrients and manufacture complex molecules. None of this violates the second law, for the work that organisms do is properly paid for by an external source of energy, just as a working machine performs its task at the expense of power generated by the local power station.⁵

'Negentropy' or negative entropy is the energy the organisms extract from their surroundings: solar energy is the main vector of negentropy. Information is of a negentropic character. Norbert Wiener who coined the word *cybernetics* in a new meaning is at the origin of what has been called after him the 'cybernetic revolution'.⁶ Wiener explains how control and communication do not only mean verbal exchanges

³ Jean Ladrière, V° *Cybernétique*, in: *Encyclopedia Universalis*, vol. 6 (1996), p. 982-983.

⁴ Ilya Prigogine et Isabelle Stengers, *Entre le temps et l'éternité* (Paris, Fayard, 1988), p. 136.

⁵ Franklin M. Harold, *The Way of the Cell*, Molecules, Organisms and the Order of Life (Oxford Univ. Press, 2001), p. 82.

⁶ Georges B. Boulanger, La Révolution cybernétique, 17 *Revue internationale de philosophie* (1963), 222-242 ; Robert J. van Egten, A propos d'un essai de formalisation des concepts de la cybernétique, 14 *Cybernetica* (1971), 251-271, p. 253 ; Jean Lojkine, *La révolution informationnelle* (Paris, PUF, 1992).

between human beings but stretch to machines, living tissues and animal society. As for the vocabulary:

we have been forced to coin at least one artificial neo-Greek expression to fill the gap. We have decided to call the entire field of control and communication theory, whether in the machine or in the animal, by the name of Cybernetics, which we form from the Greek *kubernetes* or *steersman*.⁷

On 6 and 7 November 1945, Wiener, Rosenbluth, von Neumann, Lorente de Lo and Mc Culloch met at Princeton and set up a permanent research centre to bring together engineers and neurobiologists. According to Wiener, cybernetics was born from this coalition.⁸ Another definition of cybernetics is:

A branch of mathematics dealing with the problems of control, recursiveness, and information.⁹

Wiener also stressed “the influence of mathematical logic”: indeed, the secret of cybernetics is the magic of numerals: every message is

⁷ Norbert Wiener, *Cybernetics or Control and Communication in the animal and the machine* (Paris, Hermann et Cie, The Technology Press, Cambridge, Mass., John Wiley and Sons, Inc., New York, 1948), p. 19 ; Edgar Taschdjian, *The Third Cybernetics*, XIX *Cybernetics* (1976), p. 93-104 ; Arturo Rosenbluth, Norbert Wiener and Julian Bigelow, *Behavior, Purpose and Teleology*, X *Philosophy of Science* (1943), p. 18-24. On the life of Norbert Wiener see: Freeman Dyson, *The Tragic Tale of a Genius*, *The New York Review*, July 14, 2005, p. 10-13, commenting three biographies of the scientist. Dyson is downplaying the role of Wiener in the adoption of digitalisation and also his participation in anti-aircraft systems of the American Army.

⁸ Philippe Breton, *Normes sociales, rationalité technique et système naturel dans l'œuvre de Norbert Wiener*, in: *Systèmes naturels, Systèmes artificiels*, sous la direction de Frank Tinland (Collection milieux, Champ Vallon, 01420 Seyssel, 1991), p. 204-211, at 205. See also: Philippe Breton et Serge Proulx, *L'explosion de la communication à l'aube du XXIe siècle* (Ed. La découverte, 2002), p. 115, 125. For an enlarged evaluation of Wiener's contribution: Niklas Luhmann, *Zweckbegriff und Systemrationalität, Über die Funktion von Zwecken in sozialen Systemen* (1st ed., 1968, 2. Aufl. 1977, Suhrkamp), p. 157-165; Claude Levi-Strauss, *Anthropologie structurale* (Plon, 1958), p. 401.

⁹ Gregory Bateson, *Mind and Nature. A Necessary Unity* (Bantam Books, 1979), p. 245. Comp. Ladière (note 3): Cybernetics depends on the theory of algorithms *i.e.* a branch of the mathematical logic.

conveyed through the combinations of two values, one positive the other negative, 1 and 0. Not only are the highest numbers transmitted under the guise of 1 and 0, not only every word of the vocabulary in any language follows the same pattern, but even images and sounds are encapsulated into the digital code.

If I were to choose a patron saint for cybernetics out of the history of science I should have to choose Leibniz.¹⁰

A digital machine functions with entries which, just as the nervous synapses, react to a yes-or-no movement, an all-or nothing approach.¹¹ Another pioneer of cybernetics, next to Norbert Wiener, Alan Turing did also describe digital computers as machines “intended to carry out any operations which could be done by a human computer”.¹² According to Turing, the idea of a digital computer dates back to Charles Babbage, Lucanian Professor of mathematics at Cambridge from 1828 to 1859, who planned a machine called “analytical engine”, he never achieved.¹³ The brain is also a digital computer.¹⁴

Wiener reminds us of the first use of the French word *cybernétique* by a French scientist, André-Marie Ampère (1775-1836) who in 1834 named as such the science of the means of government.¹⁵ In English use, governor has retained the meaning of the head of a government,

¹⁰ Wiener (note 7), p. 20 ; Norbert Wiener, *Cybernétique et société* (1st American ed., 1950, French translation, 1952, 2^e éd., 1954, 1962), p. 47-49.

¹¹ Wiener (note 10), p. 180, 193.

¹² Alan Turing, Computing Machinery and Intelligence, LIX *Mind* (n° 2236, Oct. 1950), 433-460, reproduced in: *The Philosophy of Artificial Intelligence* (ed. Margaret A. Boden, Oxford Univ. Press, 1990), p. 40-66, p. 43. See also: Andrew Hodges, *Alan Turing ou l'émergence de l'intelligence*, French translation somewhat abridged of: Alan Turing, *The Emergence of Intelligence*, (Burnett Book Ltd.), translated by Nathalie Zimmerman (Bibl. hist. Payot), 1988, p. 218-219.

¹³ Turing (note 12), p. 45; Magorah Maruyana, Paradigmatology and Application to Cross-disciplinary, Cross-professoral and Cross-cultural Communication, *Cybernetica* (1974), p. 136-156, 237-281, at 244.

¹⁴ John R. Searle, Minds, Brains and Programs, from *The Behavioral and Brain Sciences* (1980), reproduced in: *The Philosophy...* (note 12), p. 67-88, p. 87. See also: Allen Newell and Herbert A. Simon, Computer Science or Empirical Enquiry: Symbols and Search, 10th Turing Lecture, reproduced in: *The Philosophy ...* (note 12), p. 105-132 ; Frederick P. Brooks Jr., *The Mythical Man-Mouth* (Addison-Wesley, 1993), p. 183.

¹⁵ Wiener (note 7), p. 42 ; see also: Georges Canguilhem, *Idéologie et rationalité dans les sciences de la vie* (2 ed., Paris, Librairie philosophique J. Vrin, 1981), p. 82.

while in the French world *gouvernail* (rudder, helm), the link with the Greek word and the naval application did not get lost. As a seafaring people, the Greeks took the notion of government from the maritime realm.

According to *The Oxford English Dictionary*, the use of the word *governor* to mean “a steersman, pilot, captain at a vessel” is obsolete. The quoted examples do not go later than 1611. The meaning switched over to machinery:

A self-acting contrivance for regulating the passage of gas, steam, water, etc., esp. the supply of any one of these to a machine, in order to ensure an even and regular motion. (n. 8)

In the opinion of another pioneer of cybernetics, Claude Shannon, who was active at the Bell Telephone Cy and as such very attentive to the crackling noises disturbing the communication, the transmission of messages is yielding to entropy: the message loses a part of its signification through its very transmission. A Japanese scientist has given a poetic expression to that phenomenon of entropy:

A footprint on a sand beach which has not been blown by winds has more information than a similar footprint which has decayed because of the wind.¹⁶

'Feedbak control' consists in information from the process used to correct a machine's operation:

Watt's governor is an example of such a system: it maintains the speed of rotation of the driving shaft of a steam engine approximately constant in the face of a load variation. It is thus capable of regulating itself automatically (self-regulation) without any intervention by human operators once the latter have set the reference parameter.¹⁷

¹⁶ Maruyana (note 13), p. 243.

¹⁷ Roberto Cordeschi, *Cybernetics*, in: *Philosophy of Computing and Information* (The Blackwell Guide to –), ed. by Luciano Floridi (2004), p. 186-196 ; Otto Mayr, *Maxwell and the Origins of Cybernetics*, *ISIS*, vol. 6 (1971), 425-444 ; Warren S. McCulloch, *Embodiments of Mind* (The MIT Press, 1965), p. 151-158 ; *Encyclopedia Britannica* (15th ed., 1975), V° *Control System* ; Joël de Rosnay, *L'homme*

The theory of James Watt's (1736-1814) fly-back regulator (1769) has been made by James Clerk Maxwell (1831-1879) in 1868. Norbert Wiener's main contribution consists in having put forward the identity of the problems relating to control and communication in the animal is in the machine. Nobody before Wiener did ascertain such similitudes.¹⁸

The very idea of self-governing machines leads to the notion of 'social autopoiesis'¹⁹. An autopoietic system is

a system, in which the specific features of a communication can be determined only recursively by reference to prior or future communication.²⁰

Such a system cannot be based on "any ontological ordering, whether it be inspired by theology, philosophy, science or even common sense".²¹ What is called a legal order is like a linguistic system.

"Language" as Saussure put it "is a system of interdependent terms in which the value of each term results solely from the simultaneous presence of others".²²

symbiotique, Regards sur le 3^e millénaire (Seuil, 1995), p. 71 ; Louis Couffignal, *La Cybernétique* (PUF, coll. Que sais-je ?, n° 638, 1963), p. 24.

¹⁸ Van Egten (note 6) p. 253.

¹⁹ The composite word *autopoietos* is translated by 'produced by itself'. The word 'self-reference' does not entirely correspond to autopoiesis which has to be used in that form. Comp. Heinz von Foerster, 'A constructive Epistemology', *Cahiers de la Fondation J. Piaget*, 1982, 191-213, p. 211; Gunther Teubner, *Recht as autopoiesisches System* (Frankfurt/M, Suhrkamp, 1989), p. 18-35 ; François Ewald, *L'Etat providence* (Grasset, 1986), p. 247-252.

²⁰ Niklas Luhmann, Legal Argumentation: An Analysis of its Form 58 *The Modern Law Review* (1995), 285-298, at 286; The Third Question: The Creative Use of Paradoxes in Law and Legal History, 15 *Journal of Law and Society* (1988) 153-165; L'unité du système juridique, 31 *Archives de philosophie du droit* (1986), 163-188; *Social Systems*, Translated by John Bednarz, Jr., with Dirk Baecher, p. 34-37, 218-221, 262-267, 346-349, 359-361. The original German book, *Soziale Systeme*, was published in 1984.

²¹ Anton Schütz, The Twilight of the Global Polis: On losing Paradigm, Environing Systems and Observing World Society, in: *Global Law Without a State* (ed. by Gunther Teubner, Dartmouth, Aldeshot, 1997), p. 256-293, at 272.

²² Thomas C. Heller, Structuralism and Critique, 36 *Stanford Law Review* (1984), 127-198, at 142. Comp. J.M. Balkin, The Crystalline Structure of Legal Thought, 39 *Rutgers Law Review* (1986), 1-110, at 72-73.

Structuralism which has preceded and accompanied the development of cybernetics is a system of thought taking into account the autonomy of a self-regulated organization which is incompatible with any hierarchical order: the order squints out the inner relationships of all composing parts. There is no place for a hierarchical system of subordination. Consequently, the traditional pattern of a system of orders and commands, of the subordination of subjects to an all-empowered state, of the hierarchy within the state and of the relationships of municipal legal orders within a universal legal order is displaced by different and multiple acts of autoregulated forces. A theory of law inspired by structuralism is more in sync with a society which has gone through the cybernetic revolution.²³ The development of biological sciences has reinforced the structuralist inspiration:

Here we reach an edge, and are left contemplating the disquieting notion of an orchestra without a conductor. Physicists use the term self-organization to describe what happens in a system which' constituents convert from individual random movements to a state of global cooperativity.²⁴

Cybernetics during WWII

Born on 23 June 1912, as the son of a British civil servant in India, Alan Mattison Turing was a student in mathematics at the University of Cambridge and read the works of John von Neumann (*Grundfragen der*

²³ See for instance: Victor Tadros, *Between Governance and Discipline: The Law and Michel Foucault*, 18 *Oxford Journal of Legal Studies* (1998), 75-103; François Ewald, *Le droit du droit*, 31 *Archives de philosophie du droit* (1986), 245-259; *Autopoietic Law: A New Approach to Law and Society* (ed. Günther Teubner, Berlin, W. de Gruyter, 1988) and its recension by Arthur J. Jackson, *Autopoietic Law: The New Science of Niklas Luhmann*, 87 *Michigan Law Review* (1989), 1647-1689; Jacques Derrida, *L'écriture et la différence* (Ed. du Seuil, 1967), p. 11, 27-28, 43, 229-251, 409-428; Jean-Pierre Vernant, *L'individu, la mort, l'amour* (Folio, Histoire, 1989), p. 103-115; *Mythe et société en Grèce ancienne* (Maspero, 1974), p. 8, 83, 167; François Jacob, *La logique du vivant. Une histoire de l'hérédité* (TEL, Gallimard, 1970), p. 212-217, 268-272; Claude Lévi-Strauss, *La pensée sauvage* (Plon, 1962), p. 354-356. On the structuralist analysis: Claude Lévi-Strauss, *Du miel aux cendres* (Plon, 1966), p. 408; *L'homme nu* (Plon, 1971), p. 572. On the link between cybernetics and the doctrine of evolution, see: Bateson (note 9), p. 44-45.

²⁴ Harold (note 5), p. 113.

Quantenmechaniks) and of a German mathematician, David Hilbert (1862-1943).²⁵ He published in 1937 a paper entitled: “On computable Numbers, with an application to the Entscheidungsproblem”²⁶, of which John von Neumann was cognizant.²⁷ Turing served the British Government during the war as a cryptographer. He used his computers to decrypt war messages intercepted by the British. During the war he met in the United States with Claude Shannon who worked for the Bell Company and was also a mathematician interested in electronics. Von Neumann was a counsellor to the American Government in the field of ballistics while Norbert Wiener was active in the radiation laboratory of the MIT for the adjustment of anti aircraft guns.²⁸

That tiny group of bright mathematicians who supported the war effort of the Allied Powers were very appreciative of one another²⁹. A basic idea of Turing “who is perhaps the first among those who have studied the logical possibilities of the machine as an intellectual experiment” was artificial intelligence. In his paper of 1950 (note 12), he asks a blunt question: “Can machines think ?” His answer is yes. Other scientists have distinguished 'strong' and 'weak' artificial intelligence.³⁰ According to John Searle, the invention of artificial intelligence would present an exacerbated version of the Cartesian

²⁵ On the biography of Turing, see: Hodges (note 12).

²⁶ *Proceedings of the London mathematical Society*, Series 2, 42 (1936-1937), 230-265. See: Jack Copeland: *Computation*, in *Philosophy of Computing...* (note 17), p. 3-17, p. 4.

²⁷ Hodges (note 12), p. 130.

²⁸ Charles Mopsick, preface to Norbert Wiener, *God and Golem Inc* (1st ed., 1964, French translation 2000, Nîmes, Ed. de l'Éclat), p. 8; Breton (note 8), p. 205; Wiener (note 10), p. 187-190, 409-410. But comp. above, note 7.

²⁹ See for instance Wiener on Turing in: Wiener (note 7), p. 21, 32, 147. Michel Serres does not hesitate to set Turing in the line of Pascal, Leibniz and Babbage (*Hominescence*, Ed. Le Pommier, 2001, p. 80). Turing's life tragically ended by suicide after he had been put in jail for homosexuality between consenting adults in application of the English statute on gross indecency. See Hodges (note 12), p. 377-393.

³⁰ Searle (note 14), p. 67, 85; Simon Feigenbaum, in: *Faut-il brûler Descartes ?*, Entretiens avec Guitta Pessis-Pasternak, *Du chaos à l'intelligence artificielle: quand les scientifiques s'interrogent* (Ed. La découverte, 1991), p. 222; James H. Fetzer, *The philosophy of artificial intelligence and its Critique*, in: *Philosophy...* (note 17), p. 119-134, at 124 ; Paul Thagart, *Computing in the philosophy of science*, *eod. loco*, p. 307-317, at 310-311.

dualism, by separating the mind from its biological substratum.³¹ More scientists today consider the neurones as electronic computers.³²

The link between war and technological inventiveness is obvious. Such is the dependence of war on speedy and secure communications. Roman roads were built throughout the Empire along a Persian example for the shifting of soldiers and the sending of messages. World War One developed the use of aircraft. Electronic warfare combines applied calculation, registering of data and remote control of guns. The Kosovo campaign has been called a 'zero-dead' war because NATO troops were kept at a safe distance from enemy targets. Warfare was 'robotized': robot comes from a Czech word *robota*, forced labour, and was first used by Karel Capek (1890-1938) in his play *R.U.R (Rossum's Universal Robots, 1920)*. It is no coincidence that Prague was also the city where Reb Löw made a man of clay and endowed him with life. Norbert Wiener published in 1968 a short pamphlet called *God and Golem* (supra, note 28) where he linked the science-made real robots with the mythical one.³³

³¹ Searle (note 14), p. 86-87. Called Holy Grail, the artificial intelligence would remain an unrealized dream: Brian P. McLaughlin, Computationalism, connectionism and the philosophy of the mind, in *Philosophy of Computing...* (note 17), p. 135-151, at 138. A majoritarian opinion among scientists is cautious on (strong) artificial intelligence: See for instance: Breton/Proulx (note 8), p. 331 and Philippe Breton, *A l'image de l'homme. Du Golem aux créations virtuelles* (Ed. du Seuil, 1995). See also: Rosnay (note 17), p. 97; Cyril Fiévet, *Les robots* (Coll. Que sais-je ?, 2002), p. 108-119 ; Jacques Printz, *Le génie logiciel* (Coll. Que sais-je ?, 2001), p. 124 ; Hubert L. Dreyfus and Stuart E. Dreyfus, Making a Mind versus Modelling the Brain: Intelligence back at a Brand-point, in: *Philosophy...* (note 17), p. 301-333); Christian de Duve, *A l'écoute du vivant* (Odile Jacob, 2002), p. 317 ; Jean Baudrillard, *Le crime parfait* (Galilée, 1995), p. 59.

³² John von Neumann, *L'ordinateur et le cerveau* (translated from the american by Pascal Engel, Flammarion, 1996), p. 46-57. The original American text is: *The Computer and the Brain*, it could not be finalized since von Neumann died on 8 February 1957.

³³ The new computer of the Weizmann Institute in Rehovot was called *Golem*. See: Gershom Scholem, *Le Golem de Prague et le Golem de Rehovot* , in Wiener (note 28).

The first generation of 'Hackers'

The United States Armed Forces did not limit their use of computers to send cruise missiles to the appropriate targets, with some misgivings.³⁴ After having decrypted enemy messages they also used computers to exchange information. The Advanced Research Projects Agency Network (ARPANET) founded in 1958 intended to provide communication between computers in a way that permitted a very broad range of interaction.³⁵ One of the scopes was to decentralize military communication in order to prevent the dismantlement of or infiltration into the United States intelligence system by an enemy power.

Next to the military and almost contemporaneously after World War Two, young scientists in a nucleus of American universities did exchange information on their activities and also jokes through their computers. In the summer of 1969 Larry Roberts, then of Information Procuring Techniques Office (IPTO), invited a small group of graduate students from selected sites – the University of California at Los Angeles (UCLA), the Stanford Research Institute (SRI), the University of California at Santa Barbara (UCSB) and the University of Utah – to work on the definition and design of a network. This group was to become known as the Network Working Group.³⁶

The members of this group of young bright people were called 'hackers':

The original German/Yiddish expression referred to someone so inept as to make furniture with an axe, but somehow the meaning has been twisted so that it now generally connotes someone

³⁴ One quoted example is the crashing down of an Iranian civil aircraft due to a mistake in reading the radar screen: Philippe Quéau, *Le virtuel*, Vertus et vertiges (Ed. Champ Vallon, 01420 Seysel, 1983), p. 38-39.

³⁵ Daniel C. Lynch, Introduction in: *Internet System Handbook*. (1993). Daniel C. Lynch and Marshall T. Rose (Eds.). Addison-Wesley Publishing Cy, Inc., Reading, Mass, p. 3-14. See also: Barry M. Leiner, Vinton G. Cerf and al., *Back to Internet History. A Brief History of the Internet* (updated 20 February 1998), in: Tito Ballarino, *Internet nel mondo della legge* (CEDAM, Milano, 1998), p. 300-319.

³⁶ Lynch (note 35), p. 5 ; David H. Crocker, Evolving the system , in: *Internet System...* (note 35), p. 43 ; Ramon Khanna, Brian Lloyd and William Yundt, Tools for an Internet Component , *eod. loco*, p. 538 ; Lawrence Lessig, *Codes and other Laws of Cyberspace* (Basic Books, New York, 1999), p. 25.

obsessed with programming and computers but possessing a fair degree of skill and competence.³⁷

The so-called hackers did not pursue filthy lucre nor did they contemplate a career in the field of computers even if some among them did succeed in their profession later on.³⁸ However, there occurred a semantic gliding to which *The Oxford English Dictionary* is attentive. Another colloquial use of the expression is added to the first one:

A person who used his skill with computers to try to gain unauthorized access to computer files or networks.

Some scholars note the existence of two kinds of hackers. In a recent work a Canadian professor, Manuel Castells maintains a positive image of the hackers and distinguishes them from *crackers*, incompetent spoil-sport.³⁹

The commercialisation of Internet

The United States Army with its intelligence agencies so as brilliant graduate students in a few universities were at the origin of computers organized for the exchange of ideas and information. The interest of governmental agencies came later on. A Washington think tank, the

³⁷ *The Oxford English Dictionary*, V° Hacker, 3, a. The term seems to have originated at MIT.

³⁸ Ted Friedman, Making sense of software: computer games and interactive textuality, in: *Cybersociety*, Computer mediated communication and community (Steven G. Jones, ed., Sage Publications, 1995), p. 75; Jan Fernback, The Individual within the Collective Virtual Ideology and the Realization of Collective Principles, in: *Virtual Culture*, Identity and Communication in Cybersociety (Steven G. Jones, ed., Sage Publications, 1997), p. 36-54, p. 51 ; Pierre Lévy, *Cyberculture*, Rapport au Conseil de l'Europe (Ed. Odile Jacob, 1997), p. 36, 144 ; Breton/Proulx (note 8), p. 292; Patrice Flichy, *L'émergence d'Internet* (Ed. La découverte, 2001), p. 85-86.

³⁹ Manuel Castells, *La galaxie internet* (translated from the English by Paul Chamla, Fayard, 2001), p. 10, note 1, p. 24, 55-56, 65-67, 184; Howard Rheingold, *Les communautés virtuelles* (translated from the American by Lionel Lumbroso, Ed. Addison-Wesley, France, 1995), p. 254; Brent Wible, A Site where Hackers are Welcome: Using Hack in Contexts to Shape Preference and Deter Computer Crime, 112 *The Yale Law Journal* (2003), 1577-1623.

National Science Foundation (NSF) became interested in what was called Internet and decided to proliferate the technology to lots of universities and “not just the cream-of-the-crop institutions that had been involved to date (MIT, Stanford, Berkeley, UCLA, etc.)”.⁴⁰ Up to the middle of the 1980s, the affirmation of Professor Lessig still came true:

The Internet was built for research, not commerce (indeed, until 1991 the National Science Foundation forbade its use for commerce).⁴¹

The changes in the use of computers were tremendous. The first element was a technical one: at the origin a computer was, as is indicated by its very name, made for calculation and required very big and cumbersome machines. With the miniaturization of electronic devices and the production of smaller components and greater compactness of layout, saving in bulk and weight, the computer has been made available to every household. The expansion of informatics has also become geographically universal, even if its diffusion in different parts of the world is unequal.

The linkage of every computer in the world to a unique 'Web' needed a common language to accede to the network and to communicate. The Defence Advance Research Projects Agency (DARPA), which succeeded in 1972 to ARPA supported a protocol common to all computers, the Transmission Control Protocol – Internet Protocol (TCP-IP).⁴²

Internet is participating in the all-encompassing phenomenon of globalisation. The first judgment of the United States Supreme Court to which a case about Internet was referred delivered in its motivation the following definition:

⁴⁰ Lynch (note 35), p. 12 ; Barry M. Leiner, « Globalization of the Internet », *in: Internet System...* (note 35), p. 22 ; Khanna (note 36), p. 538 ; Breton/Proulx (note 8), p. 291 ; Castells (note 39), p. 21-22.

⁴¹ Lessig (note 36), p. 39. Similarly: Philip J. Weiser, « The Internet, Innovations, and Intellectual Property Policy », 103 *Columbia Law Review* (2003), 534-613, at 537.

⁴² Weiser (note 41), p. 541-542 ; Lynch (note 35), p. 9-11 ; A. Michael Fromkin, Habermas@ Discourse Net: Toward a Critical Theory of Cyberspace, 116 *Harvard Law Review* (2003), 749-873, at 782-796 ; Crocker (note 36), p. 42-44 ; Jan Postel, Main Applications, *in: Internet-System...*(note 35), 183-274, p. 184-185.

The Internet is an international network of interconnected computers. It is the outgrowth of what began in 1969 as a military program called ARPANET, which was designed to enable computers opened by the military, defence contractors, and universities conducting defence-related research to communicate with one another by redundant channels even if some portions of the network were damaged in a war. While the ARPANET no longer exists, it provided an example for the development of a number of civilian networks that, eventually linking with each other, now enable ten of millions of people to communicate with one another and to access vast amounts of information from around the world. The Internet is "a unique and wholly new medium of worldwide communication".⁴³

The relevancy of the Supreme Court's definition in *Reno* can be controversial: it stresses too much the role of the military, ignores the contribution of scholars and suggests that Internet is "an American thing", which is correct, but not so much so.

Not only is the nervous centre of the network of networks localized in the United States but the diffusion of Internet outside that country is concentrated on limited geographical zones (Europe, and principally, France, the United Kingdom and the countries of Northern Europe), Australia, Japan. The developing countries are following suit and as soon as they think to have joined the members of cyberculture, they are already outdistanced by the main body of computer users. More than 93 % of human beings have no access to Internet and 87 % of the sites are English speaking.⁴⁴ This is what professor Castells calls the "world

⁴³ *Reno v. American Civil Liberties Union et al.*, 117 S Ct 2329, at 2334 (1997), quoting the findings of note 81 in 929 F Supp 844.

⁴⁴ Castells (note 39), p. 307, 312; Stanowski, *Virtual reality in: Philosophy of Computing* (note 17), p. 167-177; Rosnay (note 17), p. 78; Wesley Cooper, *Internet Culture in: Philosophy of Computing* (note 17), p. 92-105; Charles Ess, *Computer mediated Communication and Human-Computer-Interaction eod. loco*, p. 76-91, at 82-83; Nicholas Negroponte, *L'homme numérique (Being Digital)*, translated by Michèle Garène, Ed. Robert Laffont, 1995), p. 12. The last author expresses a view exagerately optimistic when he substitutes the opposition young-old for the opposition rich-poor.

numerical fracture”⁴⁵ and its source is not the discovery of informatics since it developed in a society which is structurally unequal.

The Court is also missing the fact that Internet has been made a matter of trade, since the most significant mutation concerns the colonisation of Internet by commerce. It occurred on various levels: the fabrication and the selling of computers (hard-ware) is a new branch of industry launching innovative gadgets, but the development of programs (soft-ware) is no less active. Mobile phones, the diffusion of talking through the small messages system (SMS), the fashioning of digital music and digital video devices (DVD) occupy an always extending market. All kinds of commercial operations are made on line: selling, auctioning, buying aircraft tickets. Low cost air companies are exclusively working through the Net. Most messages are of an economic nature: selling on line (business to consumer, B2C), or relationships between enterprises (business to business, B2B) or between the different members of an enterprise (Intranet). One cannot dissimulate the power exercised by corporate control.

An American lawyer, James Boyle, has compared the appropriation of the benefits of Internet to the Enclosure movement⁴⁶, which evokes a well-known evolution of English property law during the 17th century. According to ancient law and customs large tracks of land were abandoned to the common usage of the people. The enclosure movement purposed to privatise the commons in order to allow for a more rational use of it. In fact the landlords were upsetting the social order by depriving the poor from the free use of the commons. According to Boyle, the second Enclosure Movement occurred in the 19th century with the extend of intellectual property to mere facts. The leading case in the United States was a suit brought by a group of daily papers against Associated Press which sold news to 900 papers and did not accept that papers that were not affiliated to its network did reproduce those news as soon as they appeared in the syndicated papers. International News Service’s case was based on the traditional view that copyright only protected the form, the originality of a work. Facts were not apt to be submitted to intellectual property. That rule

⁴⁵ Castells (note 39), p. 300-332. See also: Michel Serres (note 29), p. 32, 36; Michel Serres, *Les cinq sens* (Grasset, 1985), p. 237; *Atlas* (Julliard, 1994), p. 78, 235.

⁴⁶ James Boyle, The Second Enclosure Movement and the Construction of the Public Domain, in: *The Public Domain* (James Boyle, Special Editor), 69 *Law and Contemporary Problems* (2003), n° 1 and 2, p. 33-74.

was changed by the Supreme Court of the United States⁴⁷. The Court dismissed the traditional concepts of intellectual property:

For to both of them alike, news matter, however little susceptible of ownership or dominion in the absolute sense, is stock in trade, to be gathered at the cost of enterprise, organisation, skill, labor, and money, and to be distributed and sold to those who will pay money for it, as for any other merchandise. [...] It is '*quasi* property'.⁴⁸

The judgment is followed by a strong dissenting opinion of Justice Brandeis. He criticizes the property right recognized to 'news gatherer'.⁴⁹ The pernicious consequences of *Associated Press* on the privatisation of digital works as on cyber-economy has been stressed by American scholars.⁵⁰

Internet gives also an opportunity to offer in sale prohibited items, such as pornography and pedopornography, or to enter into unpopular (and sometimes prohibited) transactions such as gambling or the dissemination of racist or nazi texts and artefacts. The international diffusion of Internet gives rise to researching abroad what is prohibited at home. Anonymity can also be an incitement.

In the words of the famous New Yorker cartoon of two dogs sitting in front of a PC, "on the Internet nobody knows you are a dog".⁵¹

Pornography and more specially pedopornography are generally without the bounds of the freedom of speech, but the difficulty remains

⁴⁷ *International News Service v. Associated Press*, 248 US 215 (1918).

⁴⁸ 248 US 215 at 236.

⁴⁹ 248 US 215, 248, 263.

⁵⁰ Besides Boyd: Judith E. Cohn, Lochner in Cyberspace: The New Economic Orthodoxy of 'Right Management', 97 *Michigan Law Review* (1998), 462-563; Michael A. Heller, The Tragedy of the Anticommons Property in the Transition from Marx to Markets, 111 *Harvard Law Review* (1998), 622-688.

⁵¹ Lessig (note 36), p. 28.

to distinguish a prohibited pornographic discourse from an 'indecent' one which falls within the constitutional protection.⁵²

Many legislators are considering gambling with disfavour or prohibit it. Of course they cannot prevent their citizens from going abroad to attend brick-and-mortar casinos. How can they regulate internet-gambling? Moreover the disfavour which reaches gambling just as drinking and smoking does not dissuade the State from making money by imposing a tax on the adepts of such vices. Those who enter into such activities without paying what is due to the State are exposed to penalties: the unofficial importation of cigarettes or of alcohol is a crime. As for gambling and lotteries the state can authorize their organisation under its taxation and penalize those who enter into a similar game without the required payment. In a recent case concerning an Italian statute, the Court of Justice of the European Communities did concede that considerations of a moral, religious or cultural character so as the social dangers of gambling may be put forward by a state to restrict the access to gambling organizations in another Member State but not when the same State is encouraging the participation in national bets and prohibiting the access to foreign gambling through Internet.⁵³

Cyberspace

Cyberspace; A consensual hallucination experienced daily by billions of legitimate operations, in every nation by children being taught mathematical concepts... A graphic representation of data abstracted from the bank of every computer in the human system. Unthinkable complexity-lines of light ranged in the non-space of the mind, clusters and constellations of data. Like city light, receding...⁵⁴

Case who addressed those sentences to Molly, was a twenty-four years old American who had left his country to escape jail and was now

⁵² The American case law supports a distinction between obscenity which is beyond the pale and indecent speech which is protected by the First Amendment but can be regulated, for instance on the airwaves.

⁵³ Court of Justice of the European Communities, case C 243/01, *Gambelli*, Nov. 6, 2003, §§ 63-72.

⁵⁴ William Gibson, *Neuromancer* (1st published in Great Britain by Victor Gollancz Ltd, 1984, Harper Collins/Publishers 1995), p. 67.

living in a Japanese haven. The word *cyberspace* appears in the first pages of the novel to describe “the bodiless exultation of cyberspace”.⁵⁵ First published in 1984, *Neuromancer* is at the same time a pulp-fiction and a science-fiction. The fiction is years ahead of reality: what is described is the worldwide web which will be named for the first time five years later. The expression 'non-space of the mind' refers to the metaphorical use of the word 'space'. Moreover the book is full of 'cyborg' manipulations. In 1960, two searchers of the NASA have constructed the word *cyborg* from CYBernetic ORGAnism.⁵⁶ The cyborg is a hybrid of machine and human organism. There should be no opposition between a man domesticating the machine and the machine dominating man. Cardiac implants, prosthesis replacing an ablated or defective member set up a kind of minor cyborg. Professor Kevin Warwick who contends to have an electronic component connecting his nervous system proclaims himself to be the first cyborg of history.⁵⁷

On the pattern of cyberspace more composed words have been combined: cyberattacks, cybercars, cybercommunity, cybercrime, cybercriminology, cyberculture, cyberenterprise, cyberland, cybermovement, cyberorganisation, cyberphilosophy, cyberpost, cyberpunk and cyberpunks subculture, cyber rights, cybersex, cyberwar, cyberworld.

Another series of neologisms is based on the epithet *virtual*: virtual communities, virtual reality, virtual culture, virtual space, virtual world. To begin with virtual reality one has to consider it as "a strangely oxymoronic term".⁵⁸ For traditional philosophers, and notably for Aristotle and Thomas Aquinas real and virtual are incompatible, irreconcilable terms. What is virtual is something *in fieri*, with the potentiality of becoming real. But in cyberspace virtual reality indicates computer-generated or mediated environments, experiences and activities ranging from the near ambiguity of video-games to emerging technologies such as tele-immersion. Games are the main field of virtuality, *i.e.* games whose players choose the role they impersonate and who are able to

⁵⁵ *Op. cit.*, p. 12.

⁵⁶ Fiévet (note 31), p. 103; Flichy (note 38), p. 190-192, quoting Donna Haraway, *Simians, Cyborgs and Women: the Reinvention of Nature* (Routledge, New York, 1991), p. 180, after *Manifesto for Cyborgs* (1985); Ess (note 44), p. 79.

⁵⁷ Fiévet (note 31), p. 103. Jean-Luc Nancy has described in a short essay (*L'Intrus*, Galilée, 2000, 2d ed., 2005), the influence on the Self of a heart transplantation.

⁵⁸ Stanowski (note 44), p. 167; Daniel Peraya in: *Cyberespace et formations ouvertes* (ed. by Seraphin Alava, De Boeck-Université, Bruxelles, 2000), p. 36-39; Negroponte (note 44), p. 148-151.

change the course of events according to their own will. One comes back here to William Gibson's 'consensual hallucination'.⁵⁹ The players are implicated, immersed in the play in such a manner that their acting becomes real.

That the play is imaginary does not deprive it from its reality nor does it impede the participants to feel real emotions, fears and joys and to test the resilience, the concurrence, the hostility of the other participants. The paradox is stated in the following terms:

Virtual worlds are indeed unreal. We mean by this that they are artificial, fictitious, imaginary, intangible and invented. Yet virtual worlds are real, as well, millions of individuals are embracing the reality of virtual worlds by paying substantial sums of money to exist in them.⁶⁰

Multi-User Dungeons (MUD) are games played on a computer net and whose participants (*persons*) play a role (*persona*). Both are separated and some authors allude to it as a form of cyber-gnosticism to imply the dualist assumptions that the mind/persona is divorced from the body seated before the computer.⁶¹

⁵⁹ Stanowski (note 44), p. 169. With some reference to Gibson: Lévy (note 38), p. 107; Flichy (note 38), p. 128, 156-159; Stevens G. Jones, Understanding cybersociety in the Information Age, in: *Cybersociety* (note 38), p. 16-17; Elisabeth Reid, Virtual Worlds: Culture and Imagination, in: *Cybersociety* (note 38), p. 164-183; Castells (note 39), p. 247, note 1; Rheingold (note 39), p. 6, p. 139.

⁶⁰ Gregory Lastowka and Dan Hunter, The Laws of the Virtual World, 92 *California Law Review* (2004) 3-73 at 7-8, 22. The same authors are adding that literature is 'virtual' (p. 14) and that Stephen Russel, then a student at MIT, created the first computer program recognizable as a video game (p. 22). On the virtual world see also: Deborah G. Johnson, Computer Ethics, in: *Philosophy...* (note 17), p. 65-75, at 73; Timothy Colburn, Methodology of Computers, in: *Philosophy...* (note 17), p. 318-326, at 322; Fernback (note 38), p. 37. On the virtual city ('ville virtuelle'), see: Paul Virilio, *La bombe informatique* (Galilée, 1998), p. 20-21.

⁶¹ Rheingold (note 39), p. 3, 6, 235-240. The singular in the American title – *The virtual Community* – seems inspired by the intention to give a more unitary character to the phenomenon. See also: Lévy (note 38), p. 151-155; Flichy (note 38), p. 114-115, 198; Beth Kolko and Elisabeth Reid, Dissolution and Fragmentation: problems in on-line communities, in: *Cybersocieties* (note 38), p. 184-231; Quéau (note 34), p. 46, 74-78; Castells (note 39), p. 69-73, 147-170; Nessim Watson, Why We Argue About Virtual Communities: A Case Study of Phish. Net Fan Company, in: *Virtual Culture* (note 38), p. 102-122, at 105-106; Margaret L. McLaughlin, Kerry K. Osborn and Nicole B. Ellison, Virtual Community in a Telepresence Environment, in: *Virtual*

Avatar space is different. It is, first of all, a virtual space – like a cartoon on a television screen. But unlike a cartoon, avatar space enables you to control the characters on the screen in real time. At least, you control your character – one among many characters controlled by many others in the world.⁶²

The characters (*personae*) of the virtual world are different from protagonists of History and from purely literary creations. Between those two categories there exist crossing places. The most famous of historical personages, Alexander, Napoleon, Cleopatra, Nero, were elaborated in such a manner that they are idealized or diabolised and released from their historical reality. But some literary creations have acquired a reality which transforms them into permanent cultural phenomena, be they derived from a real person, Agamemnon, Ulysses, Oedipia, Rolando, or are fictitious (Hamlet, Don Quichote, Sherlock Holmes).

Computers are also used to simulate an action or a behaviour it would be too costly or too risky to experience *really*. Training in space flight is simulated on computers before launching any engine into the air. When in May 1961, Alan Shepard took his seat in the first American spatial engine, *Mercury*, it was the first time he was launched into the space, but it had been prepared by hundreds of simulated flights.⁶³

Culture (note 38), p. 146-168, p. 149. There are also "silent participants in the Net, who do not belong to the community since they are only 'readers' without sending messages. They are called, by a pejorative expression, 'lurkers': Watson, p. 102, 105; Joseph Schmitz, *Structural Relations, Electronic Media and Social Change: The Public Electronic Network and the Homeless*, in: *Virtual Culture* (note 38), p. 80-101.

⁶² Lessig (note 36), p. 19 et s.; Ess (note 44), p. 79; Richard C. McKinnon, *Searching for the Leviathan in Usenet*, in: *Cybersociety* (note 38), p. 112-137, p. 121, 134; *Punishing the Persons: Correctional Strategies for the Virtual Offender*, in: *Virtual Culture* (note 38), p. 206-235 at 207.

⁶³ Bruno Latour, *La science en action* (Ed. La découverte, 1989, translation from *Science in action* (Harvard Univ. press, 1987), p. 406; Isabelle Stengers, *L'invention des sciences modernes* (Ed. La découverte, 1993), p. 154-155; Herbert A. Simon, *Sciences des systèmes. Sciences de l'artificiel* (French translation by J.L. Le Moigne, Bordas, Paris, 1991), p. 14-15; Quéau (note 34), p. 18, 33; Negroponte (note 44), p. 88-90, 162; Couffignal (note 17), p. 54.

Does the common participation in computer programs institute a virtual community? The problem is whether the involved people who never met, and who are not informed of the name, the profession, the domicile of the others could form a community which is called virtual on the pattern of virtual reality. After some months, perhaps years, of verbal exchanges, it occurs that the participants decide to meet and to proceed from virtual reality to reality *tout court*. It is controversial whether on line communication can evolve into a real encounter and when the messages are of a sexual character, to some lasting relationship, even marriage. 'Tiny-sex' is a behaviour in MUD where people make sexual encounters through mere talk. There is an estimation that America On Line earned 7 millions per month in the Spring of 1996 from sex chat.⁶⁴ The Kinky Computer was among the first programs offered by the Bulletin Board System (BBS).⁶⁵ In France, the official and bureaucratic *Minitel* was made popular through the *Messageries roses*.⁶⁶

The main question is the amount of sincerity of the opinions or the feelings disclosed through the net. The observers do not agree to pass a common judgment on virtual communities. One reason is that virtual communities are very different from one another.⁶⁷

Cyberspace: a paradise of metaphors

The very expression cyberspace offers the first and the main opportunity to discuss the metaphorical nature of the language used in cybernetics. Aristotle's *Poetics* contains a classical definition of metaphor:

Metaphor is the application of a strange Term either transferred from the genus and applied to the species or from the species and

⁶⁴ Lessig (note 36), p. 16. On the MUDs, see: Lessig (note 36), p. 242, note 4, p. 74; Cooper (note 44), p. 97; Lévy (note 38), p. 194; Negroponte (note 44), p. 225; Rheingold (note 39), p. 72, 100, 152, 154, 159, 167, 171.

⁶⁵ On 'Tiny-sex' as a behaviour in MUD, see: Lessig (note 36), p. 142.

⁶⁶ Lessig, *eodem loco*.

⁶⁷ Rheingold (note 39), p. 221-234; Francis Balle, *Médias et sociétés* (11e éd. Montchrestien, 2003), p. 177-179.

applied to the genus, as from one species to another or else by analogy.⁶⁸

Cyberspace is made of the conjunction of two metaphors: cyber derived from a naval practice, and space which does not coincide with any 'physical' surface. Spatial metaphors are very widespread, logical space, poetic space, imaginary space, public space as opposed to private space. In all those metaphors the notion of space has to be distinguished from any territorial implantation. Information is also a metaphorical notion: the Latin *informare* means to give a form and indicates the immaterial principle which gives a form to some matter. In the language of communication, *inform* (and information) means to transfer a fact, an opinion or a feeling from one mind to another.

As long as verbal, or gestural, signs were exchanged at a sufficiently close distance, the communication could be deemed immediate. The progress in modes of communication overthrew that simplified (and erroneous) opinion. The first relevant innovations were the telephone and the wireless telephone. Only through an illusion, both persons who are participating in a telephonic call think they hear the 'real' voice of each other, just as if they were at a short distance in the same room. To be transmitted and received, the voice has to be transformed into electric vibrations and decoded at the other end of the line. But while the telecommunications only permit exchanges between a limited number of persons, or, in the case of broadcasting, the passive reception by innumerable auditors of a unilateral line of communication, Internet has set up a multilateral way of exchanges and communications. Moreover, it has linked together an immense thesaurus of data.

The origin of Internet dates back to the management of documents reproduced on microfilms by a scientific counsellor of President Roosevelt, Vanevar Bush.⁶⁹ What is now called *hypertext* is the interconnection of information along a non-linear method, authorizing the rapid, quasi-instantaneous exploration of large chunks of knowledge. The word *hypertext* was coined in 1962 by Ted Nelson, who called his

⁶⁸ Aristotle, *Poetics*, XXI, 7, 1457^b, English translation of Stephen Halliwall (Harvard Univ. Press, 1995).

⁶⁹ Bush was the author of a paper intitled: As we may think, *Atlantic Monthly*, July 1945. See Brooks (note 14), p. 281.

project *Xanadu*⁷⁰, name borrowed from a poem of Coleridge, *Kubla Kahn*⁷¹. In case law, *hyperlinks*⁷², (in French) *hyperliens*⁷³ are used to indicate the possibility of connecting one computer to any other.

Hypertext is a universal databank, every user of a computer is linked to all others in a world net, the Worldwide Web (www). The idea was conceived and the expression coined in 1989 by scientists working at the European Centre for nuclear research, in Switzerland, the British Tim Berners-Lee and the Belgian Hubert Cailliau.⁷⁴ Tim Berners-Lee is presently director of the World Wide Web Consortium, senior researcher at the MIT and professor of computer science at the University of Southampton.⁷⁵ Among the pioneers of collective intelligence, are still notable Douglas Engelhart, the inventor of the mouse and of the actual Windows of interfaces, Joseph Licklider who stimulated the research of interactive informatics.⁷⁶ Professor Castells names all those inventors *hackers*, which does not convey any disparaging connotation.⁷⁷ The hypertext and the universal net forming the Web have created a collective intelligence, one of “the main motors of cyberculture”.⁷⁸ To

⁷⁰ Thierry Bardini, Hypertext, in: *Philosophy...* (note 17), p. 248-260; Castells (note 39), p. 25 and note 1: Jean-Pierre Bourgois, L'hypertexte appliqué au droit: une nouvelle approche du texte et de l'information juridique, in: *Lire le droit*, Langue, texte, cognition (sous la direction de Danièle Bourcier et Pierre Mackay (LGDJ, 1992), p. 355-368, at 357; Lévy (note 38), p. 29, n. 3; p. 69; Pierre Lévy, *Qu'est-ce que le virtuel?* (Ed. La découverte, 1995), p. 38-44; Jean-François Chassaing, L'internet et le droit pénal, Dalloz, 1966, chr. 329-334; Balle (note 67), p. 209. See also: *hyperimage* (Quéau, note 34, p. 64-65), *hypermédia* (Negroponte, note 44, p. 83; Castells, note 39, p. 247-248).

⁷¹ In Xanadu did Kubla Khan / A stately pleasure-down decree: / Where Alph, the sacred river, ran / Through caverns measureless to man / Down to a sunless sea. Xanadu is the Mongol city founded by Kubla Kahn (1215-1294). The poem of Samuel Taylor Coleridge (1772-1834) describes its dream-like magnificence and luxury.

⁷² *Putman Pit v. City of Cookeville*, 221 F 3d 834, at 838 (6th Cir. 2000).

⁷³ Cass. (Belge), 2e ch. February 3, 2004, *Revue du Droit des Technologies de l'Information*, n° 19, September 2004, p. 51.

⁷⁴ Armand Dufour et Solange Ghernaouti-Hélin, *Internet* (9e éd., coll. Que sais-je ?, 2002), p. 4, 45; Weiser (note 41), footnote 8; Lévy (note 38), p. 29, note 4, p. 125, p. 271; Flichy (note 38), p. 78-80; Castells (note 39), p. 25-26, 34, 41.

⁷⁵ He is the author with Mark Fischetti of *Weaving the Web* (Harper, San Francisco, 1997). The text of oral communications can be obtained via E-mail, timbl@w3.org.

⁷⁶ Rosnay (note 17), p. 102-103; Negroponte (note 44), p. 165; Lévy (note 38), p. 148, 155; Castells (note 39), p. 19.

⁷⁷ Castells (note 39), p. 19.

⁷⁸ Castells (note 39), p. 19.

characterize “an international environment, including cyberspace and all systems of information, such as the medias”, professor Castells uses the concept of 'noosphere', taking up, without knowing it, a term coined since 1947 by Pierre Teilhard de Chardin, a French Jesuit, paleontologist and theologian who conceived the evolutionary process as a 'resurgence of consciousness' toward a summit which he calls the 'point omega'.⁷⁹

Most of those expressions are metaphorical. Typical is the use of space, a concept which comports many metaphorical uses, already quoted. The link with a territory (a physical space) is totally dissolved. In spite of the tainted origin (a pulp fiction) of the expression cyberspace, the United States Supreme Court did introduce it in the judiciary vocabulary:

According to the Government, the CDA is constitutional because it constitutes a sort of 'cyberzoning' on the Internet. But the CDA applies broadly to the entire universe of cyberspace.⁸⁰

The controversy about the use of the word community to characterize the bond between computer users can be resolved by considering that the so-called virtual community implies a metaphorical use of the word (see note 60).

The words net, network, web (in the sense of a cobweb) which are used to denominate the component parts of a new net of the nets, Internet, are borrowed, in a metaphorical meaning, from various realities. The net gathers up disparate elements that will be sorted out and ordered into a network. The web sends back to the myth told by Ovidius in the first verses of Book VI of the *Metamorphoses*. Arachne is the feminine counterpart of Prometheus. She is very clever at woollen weaving and defies Pallas in a competition which she should have won over should not Pallas have destroyed Arachne's work. The contest with the goddess is all the more audacious since Arachne has woven scenes of metamorphosis disparaging for the gods. In desper-

⁷⁹ Pierre Teilhard de Chardin, *Le phénomène humain* (Paris, Ed. du Seuil), t. Ier, 1959), p. 201-235; La formation de la matière, *Revue des Questions scientifiques* (Louvain, 1947), 7-35, reproduced in *Le phénomène humain*, t. V (1959), p. 199-231 under the title La formation de la noosphère.

⁸⁰ *Reno v. American Civil Liberties Union*, 117 S Ct 2329 (1997). The CDA is the Communication Decency Act of 1996.

tion she hangs herself and Pallas transforms her into a web that will weave her cloth eternally. The network is an organized net whose metaphorical use is usual in the field of communications: network of railways, of waterways, of the telephone.

Not only does the World Wide Web borrow its name from the animal kingdom. The mouse, the flea belong to hardware. There exist also malevolent insects: the bug, which indicates a dysfunctioning of the computer – perhaps because originally the insect had crept its way in the machine – and the worm.⁸¹ Virus is a metaphor borrowed from the pathology of living organisms.

The metaphors have extended themselves to the operations of the computer users. The expressions *navigator*, *surfing* come, as could be presumed, from the maritime vocabulary.

From hypertext to Digerati

More than forty years ago, a Canadian professor, Marshall McLuhan (1911-1980), published an immediate best-seller, *The Gutenberg Galaxy*.⁸² His main thesis was the revolution brought up by the invention of the art of printing. A civilization of the written word succeeded mainly oral societies. In the *Gutenberg Galaxy*, McLuhan was familiar with the printed word, books, organs of the press, he included into it media which were oral, the telephone, the radio broadcastings but also others which reproduced written words, the telegraph, the television.

Besides the *Gutenberg Galaxy* came the *Marconi Galaxy*. It could be deemed a return to a new form of orality: young people nowadays seldom read, they write when complying with a school obligation but they speak abundantly, exchange messages whose content is generally poor and of which - fortunately enough - nothing will remain.⁸³ Computers occupy a new ground and although McLuhan could not have contemplated their last developments, they fulfil his most famous

⁸¹ Stephen D. Crocker, Operation Security Cybercrime, *in: Internet-System* (note 35), 677-704, at 678-683; Charles E. Catlett, Evolution and Future Direction, *Ibid.*, p. 717-749, at 724-725. The Internet worm incident of Nov. 2, 1988 is related.

⁸² University of Toronto Press (1962). The French translation by Jean Par  was published in 1977: *La galaxie Gutenberg*, La gen se de l'homme typographique.

⁸³ See for instance: Eugen Volokh, Cheap speech and what it will Do, 104 *The Yale Law Journal* (1995), 1805-1850.

affirmation: “the medium is the message”.⁸⁴ Two truths are enclosed in the affirmation: every different medium is transmitting a proper message and the content of the message is dependent on the rhythm of its vehicle. There are already different styles of writing (familiar, didactic, noble, emphatic, matter of fact, etc.) so as various forms of orality: a young man does not speak on the same tone, with the same words to his mother, to his professor, to a friend, to his fiancée or to a person he meets for the first time.⁸⁵ Internet tends to flatten, to equalize the discourse, since the addressees are multiple, undeterminate.

Another element which is inherent to the medium is the velocity of transmission. “Slow news, no news?” was a question asked by a journalist at the time of the creation of CNN. McLuhan’s affirmation has to be completed: the message is not only the medium, speed of the medium has a role in the message. He also introduced another metaphor: the global village.⁸⁶

Ours is a brand-new world of allatonceness. 'Time' has erased, 'space' has vanished. We now live in a global village (...) a simultaneous happening. We are back in acoustic space. We have begun again the primordial feeling, the tribal environment from which a few centuries of literacy divorced us.

(...)

Because of electric speed, we can no longer wait and see. George Washington once remarked: “we haven’t heard from Benjamin Franklin in Paris this year. We should write him a letter”.⁸⁷

McLuhan relies on Teilhard de Chardin’s works namely when he thinks that the discovery of electromagnetism was “a prodigious biological

⁸⁴ It is the title of the first chapter of: *Understanding the media* (McGraw-Hill Book Cy, New York, 1964. French translation by Jean Paré: *Pour comprendre les média* (Ed. Mame à Tours, Ed. du Seuil, Paris, 1968). Comp the evaluation of Claude Lévi-Strauss, in: *Anthropologie structurale* (Plon, 1958), p. 401, who stresses the negative aspects of the invention of writing.

⁸⁵ See: Pierre Bourdieu, *Ce que parler veut dire* (Fayard, 1982).

⁸⁶ Virilio (note 60), p. 155-156.

⁸⁷ Marshall McLuhan and Quentin Fiore, *The Medium is the Massage, An Inventory of Effects* (Bantam Books, Inc., 1967), p. 63. See also: McLuhan (note 82), p. 21, 170, 280, 334; McLuhan (note 84), p. 55, 73, 397. The idea and the word have been taken up by Alvin Toffler, *Future Shock* (Bantam Books, 1970), p. 491, who is adding: My own choice is 'superindustrial society'. But the metaphorical richness of McLuhan’s expression is lost.

event". He holds the French Jesuit for a 'romantic biologist' who called the externalisation of our senses 'noosphere', *i.e.* the 'electronic brain of the universe'.⁸⁸ The American 'digerati' (which means digital literati) consider both thinkers, as well McLuhan as Teilhard de Chardin as the glorious forefathers of what they experience today.⁸⁹

Who owns Internet?

Sovereignty and property are the key-concepts of a universe divided into states and whose goods are submitted to a system or private appropriation. Some kinds of collective property have subsisted but they are organized on the pattern of an identifiable holder. This is the case, for instance, for the assets of corporations. The component parts of the Internet, communication networks, hardware and software, the intellectual property, the contracts entered into, depend on some law and should be reduced to ordinary standards of appropriation. Most of the relevant events are localized on the territory of sovereign states. Some are out of bound of any territorial power, for instance the airwaves through which, in the outer space, messages circulate. But the initial question remains: can the owner(s) of the Internet as a whole be identified ? The answer is straightforwardly negative:

There is no single body that controls all activities of the Internet. It is simply out there and is virtually impossible to 'switch off'.

(...)

The Internet is the first global 'institution' that has no government.

(...)

Ownership is distributed between countries and their own governments, corporations, universities and the major telecommunications ('telecoms') utilities.⁹⁰

⁸⁸ McLuhan (note 84), p. 271.

⁸⁹ See for instance: Breton/Proulx (note 8), p. 330 ; Flichy (note 37), p. 142-144, 182 ; Rosnay (note 17), p. 176, 305 ; Robert Escarpit, *L'information et la communication*, Théorie générale (Hachette Sup, 1991), p. 84. Some French writers have a more disparaging opinion of Teilhard de Chardin, for instance Jacques Ellul, *Les nouveaux possédés* (Fayard, 1973), p. 137, 174, 194.

⁹⁰ Andrew Terrett and Jaiin Monaghan, *The Internet: An Introduction for Lawyers*, in: *Law and the Internet* (ed. by Lilian Edwards and Charlotte Waelde Hart publ., Oxford, Portland/Oregon, 2d ed., 2000), p. 3.

Not only is there no 'owner' of the Internet as a whole, but the exercise of individual rights on its multiple component parts occurs piecemeal and the same is true for the determination of the State in charge of limited aspects of the communications system. The territorial jurisdiction of each state is theoretically intact but all of them are impeded of exercising it. For example, any State could forbid the use of its telecommunications to computer users, it could prohibit the selling of hardware and ban all transactions of software on its territory⁹¹, just as it could destroy all churches and interdict all religious public performances. In both cases, constitutional freedoms which moreover enjoy an international protection restrict state power.

The digital revolution places freedom of speech in a new light, such as the development of broadcast technologies of radio and television did before it.⁹²

Besides its duty to respect the freedom of speech, no State could unilaterally use its coercive force to stop or even to endanger the Internet. All interstate relations and the interaction of enterprises would be jeopardized should any state try to paralyse the actual information system. Even the internal administration of all States is now dependent on their recourse to updated information systems.

The question of the ownership of the Internet and even of its control cannot receive any global answer. It is an existing and powerful system which no human decision can put aside. Not only are the States prevented from annihilating the Internet but they have to comply with some duties to let it function properly. One of those duties is the exercise of criminal jurisdiction.

⁹¹ See: Talitha Nabbali and Mark Perry, Going for the throat: Carnivore in an ECHELON work – Part II, 20 *Computer Law and Security Report* (2004), 84-97. 'Carnivore is a surveillance technology, a software program housed in a computer unit, which is installed by properly authorized FBI agents on a particular Internet Service Provider's (ISP) network' (p. 84).

⁹² Jack M. Balkin, Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society, 79 *New York Univ. Law Review* (2004), 1-59, at 3.

Cybercrime and cyberdelict

There exist two branches of cybercriminality. In the United States, the distinction is drawn between 'computer-incidental' and 'computer-instrumental' crime. The first category includes offences in which the use of computers is involved only incidentally or tangentially to their perpetration, for instance the theft of a computer equipment. In computer-instrumental crimes the computer is involved more directly, being a 'tool' or instrument of the crime. Such are the gaining unauthorized electronic access to a computer database or credit card information in order to steal the account numbers.⁹³

The insecurity of computer networks is a much-discussed topic. The devices used by the Department of Defence (DOD) are not adequate nor appropriate to today's Internet.⁹⁴ After their development in a juridical vacuum, the misuse of computers is now the object of proper penalties. As the country of origin of the development of Internet the United States is the first country where specially conceived penal provisions have been adopted. According to the Commerce Clause of the Federal Constitution, since internet operations naturally involve more than one state, its regulation does not appertain to any state taken separately. Affirmed in the case of the repression of pedopornography through Internet⁹⁵, the principle of the exclusive competence of Congress to regulate Internet can still be better asserted as regards computer-instrumental crime.

The first federal statute punishing illicit access to and fraud in the use of computers is: *Counterfeit Access Device and Computer Fraud*

⁹³ McKinnon (note 62), p. 208-213; Neal Kumar Katyat, Digital Architecture as Crime Control, 112 *The Yale Law Journal* (2003), 2261-2289; Crocker (note 36), p. 680-681; Castells (note 39), p. 218-225; Brent Wible, A Site Where Hackers are Welcome: Using Hack-in Contents to Stop Preference and Deter Computer Crime, 112 *The Yale Law Journal* (2003), 1577-1623.

⁹⁴ Stephen Kent, Architectural Security, in: *Internet System...* (note 35), p. 369-419, at 373.

⁹⁵ Federal courts have decided that the state legislatures were incompetent to punish pornography on Internet: *ACLU v. Johnson*, 194 F 3d 1149 (10th Cir 1999). That judgment of a federal appellate court was preceded by two judgments of first instance: *American Library Association v. Patacki*, 969 F Supp 160 (SDNY 1997); *Cyberspace Cases v. Engler*, 55 F Supp 2d 737 (ED Mich. 1999). For an overview see: William Lee Biddle, Comments. State Regulations on the Internet: Where does the Balance of Federal Power lie ?, 37 *California Western Law Review* (2000), 161-183.

and Abuse law of 1984⁹⁶, modified and completed by the *National Information Infrastructures Protection Act of 1996*⁹⁷. Other relevant statutes are: *National Stolen Property Act, Mail and Wire Fraud Statutes*⁹⁸.

As was correctly perceived by the United States federal courts, computer users are active through state frontiers and it can be presumed that sender and receiver are not acting in the same state. It also explains why the European Union did contemporaneously adopt directives to be implemented by the Member States. But the Union is very different from a federal state. The authorities of the Union have to rely on the States on two levels: first EU law is applied by the courts of each Member State, the role of the European tribunals being restricted to specific issues; second, the European Parliament and the Council of the European Union which exercise jointly the legislative power have dealt with the problems raised by the use of computers through directives and not by regulations. The difference is that directives contain the basic principles of lawgiving which have to be implemented in each Member State through appropriate legislation. The consequence is that the law is harmonized within the Union but not uniformised. Some differences may subsist between the different national statutes within the limits authorized by each directive. The most important directives are:

- Directive 95/46/EC of 24 October 1995 on the protection of individuals with regard to the processing of personal data and the free movement of such data, *Official Journal*, n° L 281, 23/11/1995, p. 0031-0056.⁹⁹
- Directive 96/9/EC of 11 March 1996 on the legal protection of data bases, *Official Journal*, n° L 077, 27/03/1996, p. 0020-0028.
- Directive 97/33/EC of 30 June 1997 on interconnection in Telecommunications with regard to ensuring universal service and interoperability through application of the principles of Open Network Provision (ONP), *Official Journal*, L 139, 26/07/1997, p. 0032-0052.

⁹⁶ 18 USC, § 1030 (1994).

⁹⁷ See: Sheri A. Dillon, Douglas E. Groene and Todd Hayward, Computer Crimes, 35 *American Criminal Law Review* (1998), 503-547.

⁹⁸ 18 USC, § 1341, 1343 (1994). See also: *Electronic Communication Privacy Act of 1986*, 18 USC, § 2510-2521, 2701-2710; *Telecommunications Act of 1996*.

⁹⁹ A question of interpretation of the directive raised by a Swedish Court was answered by the Court of Justice of the European Communities: Case C-101/01, 6 November 2003, *Lindqvist*.

- Directive of 13 December 1999 on a Community framework for electronic signatures, *Official Journal*, L 13/12, 19/01/2000, p. 13.12-13.20.
- Directive 2001/29/EC of 22 May 2001 on the harmonization of certain aspects of copyrights and related rights in the information society, *Official Journal*, L 167/10, 22/06/2001, p. 167/10-167/19.
- Directive 2002/58/EC of 12 July 2002, concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications), *Official Journal*, L 201/37, 31/07/2002, p. 201/37-201/97.

The Council of Europe is another European Organisation in which all Member States of the European Union and some other States take part; it has prepared international treaties imposing obligations on the adhering States, namely the Convention of 28 January 1981 for the protection of individuals with regard to automatic processing of personal data. Another treaty which is not yet in force is the Convention on Cybercrime done at Budapest on 23 November 2001 and completed by the Additional Protocol done at Strasbourg on 2 January 2003, concerning the incrimination of racist and xenophobic acts committed through the use of computer systems.

The internal organisation of the computer networks

Law practitioners are accustomed to exercise their profession in a State governed by the rule of law (*Rechtsstaat*), to appear before state courts which belong to a pyramidal system: the regulations are received from a lawgiver and are submitted to the scrutiny of their constitutionality and their conformity to the respect of fundamental rights and freedoms (in Europe under the supervision of the European Court of Human Rights). In the European Union, national judges apply Community regulations, and address the Court of Justice of the European Communities to obtain a preliminary ruling on the interpretation of some Union regulation or directive. The system can be deemed pyramidal because it gives a sense of order, or regularity and of procuring the decision of last resort. But it has also something of a

military organization, as is well emphasized by the Austinian definition of law as a command.¹⁰⁰

That notion dates back to Hobbes' monarchical concept of the sovereign and Austin himself "was originally in the army" and it has been truly remarked that traces left may be seen in his *Lectures on jurisprudence*¹⁰¹. Although Austin's definition of law as a command has been severely criticized by the following generations¹⁰², its core significance remains present in contemporary forms of legal positivism and notably by Hans Kelsen and by Herbert Hart. The main critics which can be addressed both authors concern their identification of law and State and the enforcement of the rule of law through state coercion, which goes back to Kant's *Zwangsordnung*. Such theory of law is totally out of synch when dealing with the regulation of Internet.

Just as it is impossible to assign Internet to an identifiable owner, it is tremendously difficult to determine the origin of the applicable rules. First, one of the main principles of the positivist theory, *i.e.* a severe distinction between public law and private contracts is obfuscated by the alliance of state (and namely military) power and private enterprises in the drawing up of computer regulations. Second, the country of origin of computerization and of its economic development is the United States, and European law as much as European enterprises can only play a diminutive role. Either public or private, the entities which are coordinating the computer networks are localized in the United States. Founded in the beginning of the 1980s, the *Internet Architecture Board* (IAB) is supervising the architecture (still a metaphor) of the networks and receives reports from the *Engineering Task Force* (IETF) and of the *Internet Research Task Force* (IRTF). In June 1993, IAB,

¹⁰⁰ John Austin, *Lectures on Jurisprudence* or the philosophy of positive law (5th ed., rev. and ed. by Robert Campbell, London, John Murray, 1885).

¹⁰¹ Herbert Spencer, *The Man versus the State* (1884), reproduced in *Political Writings* (ed. by John Offer, Cambridge Univ. Press, 1994), p. 143. Equally critical: Henry Sidgwick, *The Methods of Ethics* (1st ed., 1874, 6e ed. 1901, London/McMillan and Co, Ltd), p. 300-301.

¹⁰² Henry Summer Maine, *Ancient Law* (1st publ. 1861, new ed. with introduction and notes by Sir Frederick Pollock (London, John Murray, 1930), p. 134-137; Oliver Wendell Holmes, Codes, and the Arrangement of the Law (1870), repr. 44 *Harvard Law Review* (1931), 725-737, at 728-729; The Path of the Law, 10 *Harvard Law Review* (1897), 457-478. More recently: John William Singer, The Legal Rights Debate in Analytical Jurisprudence from Bentham to Hohfeld, *Wisconsin Law Review* (1982), 875-1059 at 1009-1014; Roscoe Pound, *Jurisprudence* (5 vol. St. Paul Minnesota Co., 1959), vol. I, p. 108, p. 341; vol. II, p. 132-163.

IETF and IRTF merged in the *Internet Society* (ISOC), a non-profit public benefit corporation clustering more than 150 corporate members and six thousand individuals spread in about hundred countries. ISOC is trying to withdraw the technical administration of Internet from every governmental encroachment.¹⁰³

In a digital system, every computer is identified through the combination of 0 and 1 of the *International Protocol* address. *Domain names* are names through which the users choose to be identified, in concurrence with their IP address. *The Internet Assigned Number Authority* (IANA) has handed over its powers to the *Internet Corporation for Assigned Names and Numbers* (ICANN), a non-profit public benefit corporation which has its seat in Los Angeles (California) and is competent to assign domain names.¹⁰⁴

The Generic Top Level Domain (gTLD) is a universal system of classification of the main sectors of activity, such as com., net., org., art., firm., rec., edu. According to the Memorandum of Understanding agreed upon in May 1997, there exist *Country Code Top Level Domains* (ccTLDs). Each country is identified through two letters borrowed from the *International Organization for Standardization*, such as it (Italy), be (Belgium), fr (France), ch (Switzerland).¹⁰⁵

¹⁰³ Lynch (note 35), p. 13; Crocker (note 36), p. 48-53; Castells (note 39), p. 43; David Maher and Marc Rotenberg, Déclaration de l'ISOC, Supervision et contrôle du réseau: ONG et utilisateurs, in: *Le droit international de l'Internet*, sous la direction de Georges Chatillon, Actes du colloque de Paris, 19 et 20 novembre 2001 (Bruylant, 2002), p. 319-328; Bertrand du Marais, Auto-régulation, régulation et co-régulation des réseaux, *ibid.*, p. 293-308; Dufour/Ghernaouti-Hélin (note 74), p. 15; Pierre Trudel, La lex electronica, in: *Le droit saisi par la mondialisation*, sous la direction de Charles-Albert Morand (Bruylant, Ed. de l'ULB, Helbig et Lichtenhahn, 2001), p. 221-268, at 253-257.

¹⁰⁴ Maher/Rotenberg (note 103), p. 320, 326; Dufour/Ghernaouti (note 74), p. 15; Evelyn Clerc, La gestion semi-privée de l'Internet, in: *Le droit saisi ..* (note 103), p. 332-396, at 341-357, 370-375, 393; David Borman, A Practical Perspective on Host Networking, in: *Internet System...*(note 35), p. 309-367, at 358-363; Paul V. Mockapetris, Directory Services, *ibid.*, p. 469-491, at 477; Crocker (note 36), p. 53-54; Eric A. Caprioli, *Règlement des litiges internationaux et droit applicable dans le commerce électronique* (Litec, 2002), n° 114; Olivier Cachard, *La régulation internationale du commerce électronique* (LGDJ, 2002), n° 3, n° 49; Jonathan Zittrain, ICANN: Between the Public and the Private – Comments Before Congress, *14 Berkeley Technology Law Journal* (1999), 1076-1093.

¹⁰⁵ Maher/Rotenberg (note 103), p. 322; Dufour-Ghernaouti (note 74), p. 29-31; Clerc (note 104), p. 369; Cachard (note 104), p. 259 and note 138; Evelyne Lagrange,

The European Commission is pursuing two somewhat antithetical goals: developing computer activities within the European Union and setting European users free from subservience to the United States' domination. That preoccupation is clearly expressed in the Commission working document on the creation of the EU Internet Top Level Domain¹⁰⁶ and in the Communication from the Commission to the Council and the European Parliament on the Organisation and Management of the Internet International and European Policy Issues 1998-2000.¹⁰⁷

In a survey of the French *Conseil d'Etat* on Internet and digital networks, the uneasy feeling of a traditionalist organ of the French State is openly assessed. According to that document, "the State regulations have henceforth to enter into combination with the self-regulation (*autorégulation*) of the actors".¹⁰⁸ Further on the tone remains more overbearing: "the economic actors and the users have to be associated with the effective implementation of the principles laid down by the national or the international legislator". The highest French administrative tribunal does not seem aware of the exact meaning of *autorégulation*: it implies a spontaneous capacity of computer users to regulate themselves their own operations. The computer users agree to abide by the rules of conduct they are adhering to. The very notion of 'codes of conduct' rests on an other form of enforcement than state coercive power. It is more like the rules of a game or the good behaviour of the members of a club. The individual actor who deviates from such rules is discredited, risking even his or her exclusion from the group. Standards of conduct including mostly prohibitions, such as the prescriptions against flaming, prankplaying, unauthorized forward-

L'Internet Corporation for Assigned Names and Numbers: un essai d'identification, *Revue Générale de Droit International Public* (2004), 305-346.

¹⁰⁶ COM/2000/0153 final.

¹⁰⁷ COM/2000/0202 final. See also the proposal of a decision of the European Parliament and the Council setting up a program of the Community tending to a utilisation more secure of Internet and the new technologies on line, 12 March 2004, COM (2004) 91 final, 2004/023/COD.

¹⁰⁸ *Conseil d'Etat, Internet et les réseaux numériques* (Les études du Conseil d'Etat, La Documentation française, 1998), p. 14. See further p. 43.

ing of e-mail (spamming), dirty jokes, are “high-tech variations of conversational ‘rules’, as described in speech act theory”.¹⁰⁹

Another concept is that of ‘netetiquette’. In a French essay on that topic, formless principles have been drawn up which try to encapsulate the applicable rules,¹¹⁰ Some distinguished scholars such as Philippe Fouchard have downplayed the netetiquette, characterizing it as rules of courtesy (*règles de politesse*)¹¹¹, which are beyond the pale of a state-sponsored legal system.

Codes of conduct are a well-known reality in the realm of enterprises’ law. Some enterprises promise to abide by the rules of conduct they have proclaimed and they risk to be discredited if they don’t carry it out.¹¹² There is an European directive on the professional codes or codes of practice, but they derive part of their force from the references made to them by legislative, regulatory or administrative enactments.¹¹³

The draft code of conduct for the multinational enterprises has never been adopted but there exist partial codes of conduct in limited spheres of activity. The difference between such codes of conduct and the Netetiquette is that transnational enterprises form a relatively closed up group of entities, while the free access to Internet concerns an indefinite and boundless number of individuals, state agencies and enterprises. This is the reason why some scholars stress the formation of a kind of community between computer users. Moreover since the individuals need the services of access providers to get entry into the

¹⁰⁹ Margaret L. McLaughlin, Kerry K. Osborne, Christine B. Smith, Standards of conduct on Use, in: *Cybersociety* (note 38), p. 90-111, at 104; Watson (note 61), p. 102-132, at 119.

¹¹⁰ Michel Marcocchia, La normalisation des comportements communicatifs sur Internet: Etude sociopragmatique de la netetiquette, in: *Communication, société et internet* (Nicolas Guéguen et Laurence Tobin, ed., L’Harmattan, 1998), Actes du colloque GRESILO de Vannes, Univ. de Bretagne-Sud, 10 et 11 septembre 1998, p. 16-32.

¹¹¹ Philippe Fouchard, preface to Cachard (note 104), p. VIII.

¹¹² See for instance: Hans-Werner Maritz, The Daimler-Chrysler codes of conduct: the ideal way for global companies to export personal data to countries outside the EU/EEA?, 20 *Computer and Security Report* (2004), 185-193. On the ethical codes of enterprises, see also: Arlette Martin-Serf, La mondialisation des instruments juridiques, in: *La mondialisation du droit*, sous la direction d’Eric Loquin et de Catherine Kessedjan (Univ. de Bourgogne, CNRS (Litec, 2000)), p. 179-205, at 191-192.

¹¹³ Directive 98/34 EC of the European Parliament and the Council of 28 June 1998, *Official Journal* L 204/37.

Net, such providers are entitled to require that the computer users enter in an 'agreement to rules of user conduct'. One example is the agreement proposed by America On Line (AOL). In its version of 22 January 2004, that agreement contains a list of six series of prohibitions. Among them: (1) contents violating most of state laws (for instance defamation, invasion of another's privacy) but they also include messages which are in most countries shielded by the freedom of expression (explicit or graphic descriptions or accounts of sexual acts, vulgar language); (2) discriminatory language; (3) violation of patent, trademarks, right of publicity; (4) 'spamming'; (5) use of software viruses; (6) impersonation of any person or entity. It is doubtful whether AOL is able to exercise an effective control on all users whom it connected to the Net but the relevance of such rules of user conduct can be tested by the courts when the victim of an illicit act is complaining against a computer user. But it also occurs that AOL acts against a corporation offering pornographic Web Sites or sending unsolicited bulk e-mail (spam) to users connected through AOL as their service provider.¹¹⁴

Can the rules of conduct and the usances observed among computer users be reduced to a body of law deserving a proper name such as *lex electronica* or *lex informatica*? A strong proponent of the *lex informatica* is Professor Reidenberg.¹¹⁵ Professor Trudel goes along in the same direction under a slightly different name *lex electronica*.¹¹⁶ There is little doubt that the Latin denomination is alluding to the *lex mercatoria*, some avatar of the Law Merchant applied in the 18th century by British courts.¹¹⁷ Even in France where the concept of *lex mercatoria* was launched by Professor Berthold Goldman¹¹⁸, it has met with polite but strong criticisms, expressed in the very *Liber amicorum*

¹¹⁴ *American Online v. LCGM, Inc.*, 46 F Supp. 2d 444 (ED Va. 1998). See also: *American Online, Inc. v. National Health Care Discount, Inc.*, 121 F Supp. 2d 1255 (ND Iowa 2000).

¹¹⁵ Joel R. Reidenberg, *Lex informatica: The formulation of Information Policy Rules Through Technology*, 76 *Texas Law Review* (1998), 553-593.

¹¹⁶ Trudel (note 103), p. 221-268.

¹¹⁷ On this return to the *lex mercatoria*, see: Paul Schiff Berman, *The Globalization of Jurisdiction*, 151 *Univ. of Pennsylvania Law Review* (2002), 311-545, at 401-403, 533-541.

¹¹⁸ Berthold Goldman, *Frontières du droit et lex mercatoria*, *Archives de philosophie du droit* (1964), 177-192; *La lex mercatoria dans les contrats et l'arbitrage international*, *Journal du Droit international* (1979), 475-499.

for Goldman.¹¹⁹ While Professor Loquin is a strong supporter of the *lex mercatoria*¹²⁰, other French scholars remain more sceptic.¹²¹ However, the English-speaking legal community seems favourable to some autonomy of a self-governing cyberspace community. For instance Professor Burnstein has coined the word *cyberalty* on the pattern of admiralty.¹²² The *lex mercatoria* has received the support of an estimated Lord Justice.¹²³

The most promising sector of Internet self-regulation concerns the security architecture: how can a computerized system be made safe, protecting the peace of mind and the privacy of its users and barring every intrusion and unauthorized access?¹²⁴ Another domain concerns filtering technologies which should allow users to block out unwanted content. The Platform for Internet Content Selection is:

¹¹⁹ Paul Lagarde, *Approche critique de la lex mercatoria*, in: *Le droit des relations économiques internationales*, Etudes offertes à Berthold Goldman (Litec, 1982), p. 125-150; Philippe Kahn, *Droit international économique, droit du développement, lex mercatoria, concept unique ou pluralisme des ordres juridiques*, *ibid.*, p. 97-124; Michel Virally, *Un tiers droit? Réflexions théoriques*, *ibid.*, 373-385.

¹²⁰ E. Loquin, *La réalité des usages du commerce international*, *Revue internationale de droit économique* (1989), 163-195. See also: Hélène Ruiz Fabi, *Immatériel, territorialité et Etat*, 43 *Archives de philosophie du droit* (1999), 187-212, at 191, 201; Michel Vivant, *Cybermonde: Droit et droit des réseaux*, *Jurisclasseur périodique*, 1996, I, 3969.

¹²¹ For instance: Caprioli (note 104), n° 9; Cachard (note 104), n° 27-33; Benedicte Fauvarque-Cosson, *Le droit international privé classique à l'épreuve des réseaux*, in: *Le droit international ...* (note 103), 55-70, who speaks about the "fantasme du cyberspace" (p. 61).

¹²² Matthew R. Burnstein, *Note, Conflicts on the Net: Choice of Law in Transnational Cyberspace*, 29 *Vanderbilt Journal of Transnational Law* (1996), 75-116, at 103. See also Craeme B. Dinwoodie, *A New Copyright Order: Why National Courts Should Create Global Norms*, 149 *Univ. of Pennsylvania Law Review* (2000), 469-580, at 522-528; Henri H. Perritt, Jr., *Jurisdiction in Cyberspace*, 41 *Villanova Law Review* (1996), 1-64.

¹²³ Lord Justice Mustill, *The New Lex Mercatoria: The First Twenty-Five Years*, in: *Liber Amicorum for the Right Honourable Lord Wilberforce* (Clarendon Press, Oxford, 1987), 149-183. See also: Gunther Teubner: *Global Bukovina: Legal Pluralism in the World Society*, in: *Global Law ..* (note 21), p. 3-28 ; Hans-Joachim Mertens, *Lex mercatoria: A Self-Applying System Beyond National Law ?*, *ibid.*, p. 31-43.

¹²⁴ Stephen Kent, *Architecture Security-Digital Signature*, in *Internet System...*, (note 35), p. 369-419; Peter van Roy and Seif Haridi, *Concepts, Techniques and Models of Computer Programming* (the MIT Press, Cambridge, Mass., London England, 2004), p. 208; Weiser (note 41), p. 541-542.

a prime example of a technological solution designed to resolve the policy problem of accommodating different standards for content without compromising free speech values.¹²⁵

The subsiding role of State courts

The so-called emergence of a *lex electronica*, self-regulation of private actors, individuals and enterprises, does not put aside the role and the importance of state tribunals. Three points have to be made: (1) the autonomy of the law merchant has to be brought back to its true historical evolution; (2) the so-called Internet community is far away from traditional self-supporting and self-relying transnational organizations; (3) case-law in the domain of Internet has been approached under two different lines, the application of public or penal law, and the civil litigations.

(1) The evolutive nature of the law merchant

Originally the law merchant was made of the 'customs of merchants' by which was meant the actual usages of the European commercial world, as it then was, which was not too large a world to have pretty uniform rules and understanding.

Only in the 18th century the decisive step was taken of treating the rules of the law merchant as within the knowledge of the judges, like the general law of the land, after they had been recognized by considered decisions.¹²⁶

Frederick Pollock also considers the law merchant “as part of the Law of Nature”.¹²⁷ It brings to the idea that:

¹²⁵ Reidenberg (note 115), p. 560; Timothy Wu, Application-Centered Internet Analysis, 85 *Virginia Law Review* (1999), 1163-1204, at 1184-1188.

¹²⁶ Sir Frederick Pollock, *The Law of Torts* (13th ed., London, Stevens and Son, 1929), p. 287-288.

¹²⁷ Sir Frederick Pollock, *Essays in the Law* (Mac Millan, London, 1922, p. 55-56. In the same sense: Sir Thomas Erskine Holland, *The Elements of Jurisprudence* (13th ed., 1924, Oxford, Clarendon Press), p. 39.

That body of customs had anticipated some of the characters of international law.¹²⁸

The celebrated William Blackstone writes:

For which reason the affairs of commerce are regulated by law of their own, called the law merchant or *lex mercatoria* which all nations agree upon and take notice of. And in particular it is held to be part of the laws of England, which decide the causes of merchants by the general rules which obtain in all commercial countries.¹²⁹

Another considerable lawyer, James Lorimer (1818-1890) shares similar views.¹³⁰ The most conspicuous judgment was written in 1765 by Lord Mansfield:

The law of merchants, and the law of the land, is the same: a witness can not be admitted to prove the law of merchants. We must consider it as a point of law.¹³¹

A few years earlier Lord Mansfield declared he agreed with the opinion of the assizes:

Yet he was desirous to have a case made of it ... and especially, as the maritime law is not the law of a particular country, but the general law of nations: *Non erit alia lex Romae, alia Athenis; alia*

¹²⁸ *Eod. loco*, p. 68. The definite adoption of the law merchant as part of the common law is attributed to Lord Mansfield.

¹²⁹ William Blackstone, *Commentaries on the Laws of England* (14th ed. with the last corrections of the author, London, Strahan, 1803), I, ch. 7, V, p. 273. For a detailed story of the Law Merchant, see: William Holdsworth, *A History of English Law* (Methuen and Co Ltd, Sweet and Maxwell, London, 1st publ. 1924, 2d ed. Revised 1937, 3d ed. 1945, 2d impression 1973), vol. V, p. 60-154; vol. VIII, p. 99-300.

¹³⁰ James Lorimer, *The Institutes of the Law of Nations* (Blackwood and sons, Edinburgh and London, 2 vol., 1883-1884), vol. I (1883), p. 379-383. See also: *Select Essays in Anglo-American Legal History* (3 vol., Boston, Little Brown and Co, 1909), vol. III, p. 7-255.

¹³¹ *Pillans v. Van Mierop*, 3 Burr, 1664 (1765); 95 *English Reports* 1035 at 1038 (KB). More recently: *Goodwin v. Roberts*, LR 10 Ex 337 (1875).

*nunc, alia posthac; sed et apud omnes gentes et omni tempore una eademque lex obtinebit.*¹³²

In a country as legalistic as France, the maritime law as a part of European customary law was incorporated into the *Ordonnance sur la marine* of August 1681.¹³³

Between the Law Merchant or *lex mercatoria* of Lord Mansfield, the so-called *lex mercatoria* of contemporary arbitration in transnational commerce and the new brand of *lex mercatoria* which should be the *lex electronica* there exists only a verbal analogy. The Law Merchant was formulated during centuries before being received in English courts; the controversial *lex mercatoria* of Berthold Goldman has never acquired a definite statute; as for the *lex electronica* or *lex informatica*, all is to be done. Its pretensions are tremendous, it should be adhered to by a huge number of computer users and its main contention is to build an autonomous legal order without the support of any tribunal, neither its own, nor the state's ones.

(2) *The transnational autonomous legal systems*

Could the existing autonomous legal orders provide a pattern for a *lex electronica in fieri*? Here also the differences are striking. Two series of living legal orders which affirm their independence of the States can be contemplated. The legal order of the first group has been built up by religious confessions. The most striking example is the Catholic Church: it does not know states boundaries, it has the three branches of a legal order, legislative, judiciary and administrative.¹³⁴ Contrary to what Kelsen has written¹³⁵ it does not rule for a hereafter (*Jenseits*), its rulings apply to this world (*Diesseits*): it celebrates and dissolves marriages, ordains priests and bishops. The autonomous legal orders of a second group enjoy nowadays a considerable influence: they rule on sport organisations. To practice any sport or to enter into any competi-

¹³² *Luke v. Lyde*, 2 Burr 882 (1759); 97 *English Reports* 614 (KB).

¹³³ Jean Hilain, *Introduction historique au droit commercial* (PUF, 1986), p. 31-69; A. Esmein, *Cours élémentaire d'histoire du droit français* (Paris, Larose, 1901), p. 784; Paul Viollet, *Histoire du droit civil français* (3e éd., 1905), p. 154, quoting the opinion of Glasson, who acclaimed the *ordonnance de la marine* as a better piece of legislation than the provisions of the Napoleonic Code de commerce.

tion, one has to be affiliated to a local club, itself linked to a regional or national federation. For instance the Jockey Club rules over all horse breeding, selection, competition.¹³⁶ The International Olympic Committee is the most conspicuous example of a sport transnational legal order, analogous to the Catholic Church.

Let us now contemplate some traits common to both groups of transnational legal orders and check why they deserve that characterization. First, what about their binding nature? Even when accepting the Kantian definition of the legal order as a coercive one (*Zwangsgordnung*), it remains to define more precisely what is coercion. Of course, if you restrict coercion to physical constraints exercised on a person or on assets, the State has the monopoly of legal coercion on its own territory. But there exist other modes of coercion, the most traditional being exclusion from the group. This is precisely what religious confessions and sport organizations are perfectly fit to do. Excommunication or, as it is practised in some American religious communities, 'shunning'¹³⁷ are efficacious sanctions or penalties.

Neither excommunication nor shunning imperil the salvation of the believer in the hereinafter (this is up to God to decide), it deprives him or her of belonging to a living community in this world and bereaves him of contacts with friends and family. The seriousness of the

¹³⁴ According to Marcel Gauchet, the Catholic Church has set up "la première bureaucratie de l'Occident": *Le désenchantement du monde*, Une histoire politique de la religion (Ed. Gallimard, 1985), p. 103.

¹³⁵ Hans Kelsen, *Reine Rechtslehre* (Österreichische Staatsdruckerei, 2te Aufl., 1960, Nachdruck, 1992), p. 29-30.

¹³⁶ See the references in F. Rigaux, Les situations juridiques individuelles dans un système de relativité générale, 213 *Recueil des cours de l'Académie de droit international* (1989-I), p. 64-65.

¹³⁷ *Paul v. Watchtower Bible and Tract Society of New York, Inc.*, 819 F 2d 875 (9th Cir 1987), *certiorari denied*, 484 US 926 (1987); Justin K. Miller, Damned if you do, damned if you don't: religious shunning and the free exercise clause, 137 *Univ. of Pennsylvania Law Review* (1988), 271-302. Spinoza was excluded in 1656 from the Jewish Community of Amsterdam through a *herem*. See: Leo Strauss, *Le testament de Spinoza*, texts formulated and annotated by Gérard Almélet, Albert Baraquin, Mireille Depadt-Ejchenbaum (Paris, Cerf, 2004), p. 53-54, 84; Madeleine Francès, *Spinoza dans les pays néerlandais de la seconde moitié du XVIIe siècle* (Alcan, Paris, 1937), p. 39, 121. Menno Simons, the founder of the Mennonites, has been said to call excommunication the 'pearl of the church': J. Freudenthal, *Spinoza, sein Leben und seine Lehre* (Heidelberg, 1927), p. 74; Strauss, p. 146. In the first half of the XIXth century *herem* was still issued by the Chief Rabbi of Salonica: Mark Mazower, *Salonica, city of ghosts* (Harper/Collins, 2004), p. 164, 166.

exclusion of a sportsman or sportswoman from the competition he or she wants to participate into is still more evident. Even if the measure is only temporary, it deprives the individual from an activity whose exercise is limited to the short duration of a sport career.

Another character common to transnational legal orders is their competence to determine the criteria according to which each one is in force. State rules apply to individuals having the nationality of that state and to situations localized on its territory. Transnational legal orders which have no territory determine their scope through a personal criterium (analogous to nationality). It is for instance baptism in the case of the Catholic Church, being born from a Jewish mother for Hebraic law, voluntary affiliation to a club in the realm of sport.

A third question is bearing on the relationship of transnational legal orders with the State ones. All human activities have to be localized on the territory of one or another State. Participation to a religious cult or a sport competition necessarily occurs on some state territory. The monopoly of coercion could empower the State to prohibit the accomplishment of acts its authorities judge subversive. For instance some regimes have tried to eradicate any form of religion: the proclamation of atheism does not suffice, neither the setting up of some kind of secular ideology. Even if the State can close churches, secularise the sacred buildings, prohibit public celebration of a religious cult, it cannot impede that believers maintain their traditional faith. In a constitutional legal order where the religious liberties are guaranteed, the State has deprived itself from the exercise of that kind of power. Not only has the State the duty to tolerate the freedom of worship, but it does enter into some kind of relationship with religious confessions, even in a country as the United States where the separation of Church and State is most stringent. At its highest level the State entertains relationships with organized Churches. Not only in States where an international treaty, called *Concordat*, organizes on a contractual basis the intercourse between Church and State but also through the sending and receiving of diplomatic representations. The case of sport is still more convincing. States grant subsidies to sport organisations (what it cannot do in the United States in favour of religious confessions). They also entertain relationships at the highest level with the International Olympic Committee. For the attribution of the Olympic Games of 2012, a head of state, a prime minister and

numerous state-sponsored delegations went to Singapore in order to convince the new gods of the Olympus that their case was the best.

A last element which is common to the setting up and the entry into force of religious or sport transnational organisations is provided by the law of contract. Just as such organisations can rely on the fundamental freedoms constitutionally guaranteed, they can also resort to state-sponsored contractual obligations and form 'private associations'. That figure is well-known in American law.

Private associations like fraternities, churches, athletic leagues, country clubs and trade associations are largely self-governing both with respect to rulemaking and adjudication.¹³⁸

Religious organizations and entertainment or sport clubs are insulated from any state control or supervision. Whenever a member complains he has been dismissed contrary to the agreed upon rules, the courts refuse to interfere in such intra-associational disputes. In the case of religious organizations the tribunals' reserve is all the more justified on the ground of the separation of Church and State in the First Amendment to the Constitution. In a famous case of the 19th century, the Supreme Court of the United States declared:

The law knows no heresy.¹³⁹

A judgment of the Georgia Supreme Court is quashed down for having evaluated 'the departure from doctrine' of some members of the Presbyterian Church who had been denied the possession of a clerical building. The legal foundation of that solution is a contractual one:

All who unit themselves to such a body (the general Church) do so with an implied consent to (its) government, and are bound to submit to it.¹⁴⁰

¹³⁸ Henry H. Perritt, *Dispute Resolution in Eletronic Network Communities*, 38 *Villanova LR* (1993), 349-401, at 361 and notes 33 and 34. A very broad list of scholarly references is included in the following notes.

¹³⁹ *Watson v. Jones*, 80 US (13 Wall) 679, at 728 (1872), dictum reiterated in: *Presbyterian Church v. Mary Elisabeth Blue Hall Memorial Presbyterian Church*, 393 US 440, at 446 (1969). See also: *Gonzalez v. Roman Catholic Archbishop of Manila*, 280 US 1 (1929).

¹⁴⁰ *Watson v. Jones*, 80 US (13 Wall) 679, at 728-729 (1872).

The same rule applies even in favour of civil associations although they are not entitled to rely on the religious clause of the constitution:

Under like circumstances, effect is given in the contracts to the determination of the judicatory bodies established by clubs and civil associations.¹⁴¹

Should the fairness of the by-laws of the private association be contested, the courts do not abstain from exercising a control, employing standards for review analogous to judicial review of administrative agencies and comparing the procedures under which the association acted with common law due process standards.¹⁴²

(3) Case-law in the domain of Internet

This topic is subdivided in two parts: application of constitutional or penal law, and civil litigation in cases involving Internet.

The application of constitutional and penal law

The repression of pedopornography

The United States Congress has carried statutes in order to struggle against child pornography or pedopornography. The constitutionality of all statutes has been brought before a federal court and in all cases but one (and only partially) the Supreme Court of the United States decided that the legislator had contravened the First Amendment to the Constitution:

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press, or the right of the people peaceably to assemble, and to petition the Government for a redress of grievance.

¹⁴¹ *Gonzalez v. Roman Catholic Archbishop of Manila*, 280 US , at 16-17 (1929).

¹⁴² Perritt (note 138), p. 362.

In all cases the claimant before the Supreme Court was the government of the United States, what indicates that the federal court of appeals had declared a federal statute unconstitutional. Although audio-visual medias are not alluded to in the constitutional provision, it is agreed that images are included in the overinclusive word *speech*.¹⁴³ As prominent as it is, the freedom of speech is neither absolute nor unlimited:

As a great principle, the First Amendment bars the government from dictating what we see or read or speak or hear. The freedom of speech has its law; it does not embrace certain categories of speech, including defamation, incitement, obscenity, and pornography produced with real children.¹⁴⁴

One of the statutes that have been deemed unconstitutional because they encompassed forms of speech which were not illicit – that kind of grievance is called overbreadth – is the Child Pornography Prevention Act of 1966. In order to protect children the legislator is not empowered to deprive adults from hearing speech or viewing images with a sexual connotation, with the sole exception of obscenity and child pornography.

The oldest judgment in the field of child pornography has already been quoted. It concerned the circulation on Internet of material harming minors and it ruled that the Communication Decency Act of 1966 contravened the First Amendment. Since the criteria of obscenity are determined by 'community standards' and since they differ locally, the judge or the jury has to choose the relevant community standards which depend on the localization of the crime.

Moreover, the 'community standard' criteria as applied to the Internet means that any communication available to a nation wide addressee will be judged by the standards of the community most likely to be offended by the message.¹⁴⁵

¹⁴³ The European Court of Human Rights has applied Article 10 of the European Convention (freedom of speech) to paintings: 24 May 1988, *Müller v. Switzerland*, *Publications of the Court*, Series A, vol. 33.

¹⁴⁴ *Ashcroft v. The Free Speech Coalition et al.*, 122 S Ct 1389, at 1399 (2002).

¹⁴⁵ *Reno v. American Civil Liberties Union et al.*, 117 S Ct 2329 (1997).

The same judgment also notes that the Internet is not “as invasive” as radio or television since the user of a computer screen is less exposed to come across a sexually explicit sight by accident. An argument raised by the Appellees because “so much sexually explicit content originated from overseas”, is dismissed by the Court, since it “raises difficult issues regarding the intended, as well as the permissible scope of, extraterritorial application of the CDA”.¹⁴⁶ On the applicability of the community standards to Internet, the Court was divided in a later decision concerning the Child Online Protection Act (COPA), *Ashcroft v. American Civil Liberties Union*¹⁴⁷, which is a 'plurality opinion', *i.e.* a decision wherein all Justices could not reach a common decision. According to Justice Thomas who announced the judgment of the Court, the COPA did not “suffer from the same flaw” as the CDA because of a narrower definition of the harmful material.¹⁴⁸ In her concurring opinion, Justice O'Connor would prefer that the Court explicitly adopt a national standard for defining obscenity on Internet.¹⁴⁹ Justice Breyer is better reconciled with the regional validity of community standards.¹⁵⁰ Three other Justices were concurring in the judgement, after having observed that it is “neither realistic nor constitutionally sound to read the First Amendment as requiring that the people of Maine or of Mississippi accept public depiction of conduct found tolerable in Las Vegas, or New York City”.¹⁵¹ Justice Stevens is the sole member of the Court who concludes to affirm the judgment of the Court of Appeals. He stresses the unique character of the Internet:

The Internet presents a unique forum for communication because information, once posted, is accessible everywhere on the network at once. The speaker cannot control access based on the location of the listener, nor can it choose the pathways through which its speech is transmitted.¹⁵²

¹⁴⁶ Footnote 45.

¹⁴⁷ 122 S Ct 1700 (2002).

¹⁴⁸ 122 S Ct 1700, at 1709 (2002). See also at 1713.

¹⁴⁹ 122 S Ct 1700, at 1715 (2002).

¹⁵⁰ 122 S Ct 170, at 1716.

¹⁵¹ Concurring opinion of Justices Kennedy, Souter and Ginsburg, quoting *Miller v. California*, 413 US 15, at 32 (1973) in 122 S Ct 1700, at 1719 (2002).

¹⁵² Dissenting opinion of Justice Stevens, 122 S Ct 1700, at 1724 (2002).

The most recent judgment is also the least significant. It concerns the Children's Internet Protection Act (CIPA) which forbids public libraries to receive federal assistance for Internet access unless they install software to block obscene or pornographic images and to prevent minors from accessing material harmful to them.¹⁵³ The plurality opinion reversed the judgment of the District Court for the Eastern District of Pennsylvania which had decided that the provision of the CIPA did contravene the First Amendment.¹⁵⁴ A judgment of 2002 had to deal with a special provision of the Child Pornography Prevention Act of 1996 (CPPA), which expands the federal protection of child pornography to include not only pornographic images made using actual children (18 US C, § 2256 (8)) (A)), but also "any visual depiction, including any photograph, film, video, picture, or computer or computer generated images or pictures", that "is, or appears to be, of a minor engaging in sexually explicit conduct (§ 2566 (8) (B), and any sexually explicit image that is "advertised, promoted, presented, described, or distributed in such a manner that conveys the impression" it depicts "a minor engaging in sexually explicit conduct" (§ 2256 (8) (D)). What is called 'virtual child pornography' is made of two kinds of images, either pornographic images of young adults that appear as children or pornographic images of children created wholly on a computer, without using any actual children ('virtual child pornography'). The character common to both techniques is that "no children are harmed in the process of creating such a pornography". The judgment of the Court of Appeals which decided that the impugned provisions of the CPPA are unconstitutional is affirmed.¹⁵⁵

The Internet is an expanded expression of the freedom of speech. It is placed as such under the protection of the First Amendment. Even if the struggle against pedopornography is a legitimate scope of the Federal legislature, it cannot be used in a manner to curb the freedom

¹⁵³ *United States v. American Library Association, Inc. et al*, 123 S Ct 2297 (2003).

¹⁵⁴ Opinion of Chief Justice Rehnquist, conjoined by Justices O'Connor, Scalia and Thomas. There are two concurring opinions, one of Justice Kennedy, the other of Justice Breyer. Three Justices have filed dissenting opinions: Stevens, Souter and Ginsburg.

¹⁵⁵ *Ashcroft v. The Free Speech Coalition, et al.* 122 S Ct 1389 (2002). The opinion of the Court was delivered by Justice Kennedy, with whom Justice Stevens, Souter, Ginsburg, Breyer and Thomas joined. Justice O'Connor concurred in part and dissented in part, Chief Justice Rehnquist and Justice Scalia dissented.

of speech. The last sentences of *Reno v. American Civil Liberties Union* are emphatic on that question.

The dramatic expanding of this new marketplace of ideas contradicts the factual basis of this contention. The record demonstrates that the growth of the Internet has been and continues to be phenomenal. As a matter of constitutional tradition, in the absence of evidence to the contrary, we presume that governmental regulation of the content of speech is more likely to interfere with the free exchange of ideas that to encourage it. The interest in encouraging freedom of expression in a democratic society outweighs any theoretical but unproved benefit of censorship.¹⁵⁶

An American federal court has even condemned for violation of 18 USC § 2252, a journalist who had infiltrated into a paedophile network to reveal it to the public.¹⁵⁷ In continental countries, the repression of pornographic messages through telecommunications does not meet with the prevalence of the freedom of speech as is the case in the United States.¹⁵⁸

Gambling

Most American States – with the notorious exception of Nevada – prohibit gambling. On the ground of the commerce clause of article I, section 8 of the Constitution Congress passed several pieces of legislation prohibiting interstate gambling. The legislation is old and

¹⁵⁶ *Reno v. American Civil Liberties Union et al.*, 117 S Ct 2329 at 2351 (1997).

¹⁵⁷ *United States v. Matthews*, 11 F supp 2d 656 (D Md 1998) ; Amy Tridgell, “Newsgathering and Child Pornography: The case of Lawrence Charles Matthews”, 33 *Columbia Journal of Law and Social Problems* (2000), 343-391.

¹⁵⁸ See for instance: Tribunal fédéral (Switzerland), 25 June 1993, *Arrêts du Tribunal fédéral*, 119, IV, 145; 17 February 1995, ATF 121, IV, 109; Cassation (Belgium), Chamber 2, 3 February 2004, *Revue du Droit des Technologies de l'Information*, n° 19, Sept. 2004, 51. The German Strafgesetzbuch distinguishes: *harte Pornographie* (§§ 11 III et 184 III StGB), *Kinderpornographie* (§§ 174, 176bis, 176b, 177, 184 III-V StGB) und *einfache Pornographie* (§ 184 I StGB und § 21 I Gesetz über die Verbreitung jugendgefährdenden Schriften und Medieninhalte. See: Tatjana Hörle, *Pornographische Schriften im Internet: Die Verbotsnormen im deutschen Strafrecht und ihre Reichweite*, *Neue Juristische Wochenschrift* (2002), 1008-1013.

abundant¹⁵⁹ since gambling casinos have always been considered as places where other felonies are concentrated, such as extortion, exploitation of prostitution and so on. It has been applied with some severity.¹⁶⁰

Internet gambling has been specially targeted by the Internet Gambling Act of 1997. The Superior Court of the state of New York condemned a Delaware corporation maintaining corporate offices in New York and wholly owning an Antigua subsidiary which acquired a licence from the government of that small island to operate a land-based casino. Since New York residents were targeted by the gambling activities, the state court decided it had jurisdiction on the facts although the defendants were acting from a foreign country where their activity was legal.¹⁶¹ According to a recent investigation published in the *New York Times*, online gambling seems totally out of bounds of United States power: based in Gibraltar and having no assets in the United States, *Party Gaming* operates a gambling Web Site. It is owned by a resident of Gibraltar who had been one of the most prominent executives in the world of interactive and online pornography. Having sold her interest in electronic pornography she has chosen a new venture: online gambling. British law in force in Gibraltar and up to now United States and individual states authorities have not seen any way to prevent American residents from internet gambling.¹⁶²

¹⁵⁹ See for instance: An Act for the Suppression of Lottery Traffic through National and Interstate Commerce and the Postal Service, Subjected to the Jurisdiction and Laws of the United States, 2 March 1895; the Act of June 1934, Pub. L. 73-416, ch. 652, § 316, 48 Statutes 18 USC § 1304 ; the Wire Wager Act, 18 USC § 1084 (1994); the Interstate Wagering Amendment: Violent Crime Control and Law Enforcement Act of 1994, 18 USC § 1301.

¹⁶⁰ See for instance the Lottery Case, *Champion v. Ames*, 188 US 321 (1903); *Pensacola Telegraph v. Western Union Telegraph*, 96 US 1 (1877); *United States v. Fabrizio*, 385 US 263 (1966). The circumstance that the bet is transmitted to a state where betting is lawful (in fact Las Vegas), does not prevent the application of the federal prohibition: *Martin v. United States*, 389 F 2d 895 (5th Cir 1968), Nevada has jurisdiction over purely national wagers not when the betting is received from another state. According to *United States v. Blair*, 54 F 3d 639 (10th Cir 1995), the Federal statute also applies to relations with a foreign jurisdiction.

¹⁶¹ *People v. World Interactive Gambling Corp.*, 714 NYS 2d 844 (Sup. Ct 1999).

¹⁶² Kurt Eichenwald, Online Gambling Company Wins Bet Against U.S. Law, *The New York Times/Le Monde*, July 9, 2005, p. 1, 4. See also: Bruce P. Keller, The Game's the Same: Why Gambling in Cyberspace Violates Federal Law? 108 *The Yale Law Journal* (1999), 1569-1609.

The protection of privacy

According to the European Court of Human Rights private life (or privacy) “is a broad term not susceptible to exhausting definition”.¹⁶³ In that case the filming of an individual in a public street was recorded and disclosed to the public by the local Council in its Circuit Television. The judgment recalls that it is:

“commonly acknowledged that the audio-visual media have often a much more immediate and powerful effect than the printmedia” (§ 62) (quoted from the *Jersild* judgment).¹⁶⁴

Moreover:

"The compilation of data by the security services on particular individuals even without the use of covert surveillance constituted an interference with the applicant's private lives" (§ 59).

The same judgment underlines the insufficient character of the rules of conduct laid down by the Press Complaints Commission, according to the Broadcasting Act 1996.¹⁶⁵

Since the European Court of Human Rights has no jurisdiction to quash down any judgment of a state court, but can only pass condemnation on the State as such, its use of a balancing test must take into consideration the following elements:

"In cases concerning the disclosure of personal data, the Court has also recognised that a margin of appreciation should be left to the competent national authorities in striking a fair balance between the relevant conflicting public and private interests. However, this margin goes hand in hand with European supervision" (§ 77).

¹⁶³ European Court of Human Rights, 28 April 2003, *Peck v. United Kingdom*, § 57.

¹⁶⁴ On the language of images, see Boorstin (note 2), p. 234-236, 239, 243-244, 249-252, 286, 290; Virilio (note 60), p. 84-87; Quéau (note 34), p. 21, 29-32, 100, 174; Jacques Ellul, *La parole humiliée* (Ed. du Seuil, 1991), p. 127-138, 202-212.

¹⁶⁵ *Peck v. United Kingdom*, §§ 105-109. See also: Jonathan Morgan, Privacy, Confidence and Horizontal Effect: Hello Trouble, 62 *Cambridge Law Journal* (2003), 444-473, at 465-466.

When the case is of interest for Internet programs, the balance has to be struck between two equally powerful rights, privacy itself and the freedom of the press.¹⁶⁶ In the United States and in the United Kingdom the freedom of speech generally takes precedence. In continental countries mostly in France and in Germany the courts tend to privilege the protection of privacy. A recent judgment of the European Court of Human Rights has tilted the balance in favour of the protection of privacy.¹⁶⁷

In a case concerning the publication through Internet of lists of debtors with failing payments the German Federal Constitutional Court stresses the importance of Internet and the fact that it occupies a 'new territory' (*Neuland*). The right of privacy of the individual is in conflict with the interest of businessmen to be informed on bad debtors. The Constitutional Court does not strike the balance between both interests. It is up to the civil courts to apply the relevant constitutional provision to the facts of the case.¹⁶⁸

The privacy of computer users is threatened from various directions. Two of them have to be underlined. The first one is the proliferation of chatting: our societies are full of isolated persons who are trying, by any means, to meet with some sister soul. The net is more open to a third-party prurient preying than any other means of communication, such as written letters or even the telephone. Another peril is the amount of information online enterprises acquire on their patrons.

¹⁶⁶ Morgan (note 165), p. 471; Gavin Phillipson, Transforming Breach of Confidence? Towards a Common Law Right of Privacy under the Human Rights Act, 66 *The Modern Law Review* (2003), 726-758, at 735-740. The referred to *Hello* case is: *Douglas and others v. Hello ! Ltd*, [2001] QB 967. Comp: *Venables and another v. News Group Newspaper Ltd* [2001] 1 All ER 908, concerning two small boys 10 years old who had murdered a baby boy of 2 years. When released from custody they asked for a change of name. The case had been submitted to the Press Complaints Commission, but one of the arguments of the Court is to stress that the Press Code, as applied by that commission "is not, in the exceptional situation of the claimants, sufficient protection" (at 937).

¹⁶⁷ European Court of Human Rights, 24 September 2004, *von Hannover v. Germany*. It ruled that the decision of the German Federal Constitutional Court of 13 April 2000 had breached Article 8 of the Human Rights Convention (§ 80). For a comment: Thorsten Lauterbach, A celebrity fight-back 'par excellence' 21 *Computer Law and Security Report* (2005), 74-77.

¹⁶⁸ BVerfG, 9 October 2001, *Schuldnerspiegel*, *Neue Juristische Wochenschrift* (2002), 741, at 742. Comp. with Reidenberg (note 115), p. 563.

Privacy today incorporates the consumer's expectations about and knowledge of the accessibility of personal information gathered by online companies. Privacy is violated when Internet companies collateralise consumers information, altering the promised limitation of accessibility posted on Web sites.¹⁶⁹

Collateralising of privacy "is an invisible, pervasive phenomenon".¹⁷⁰ The tremendous role of cyberspace in marketing is largely acknowledged. One of the devices used by the online firms is called 'cookie'.

A cookie is a small text file of codes that is deployed into the user's computer when she downloads a Web page. Web sites place a unique identification code into the cookie, and the cookie is saved on the user's hard driver. When the user visits the site again, the site looks for its cookies, recognizes the user and locates the information it collected about the user's previous surfing activity in its data base.¹⁷¹

Some civil law cases

Personal jurisdiction on online enterprises

The development of the Internet raised a lot of civil proceedings in that field. Not only is it a 'new country' as has been said by the German Federal Constitutional Court, but also one which is fast-changing:

Although we realize that attempting to apply well-established trade-mark law in the fast-developing world of the Internet, is somewhat like trying to board a moving bus, we believe that well-

¹⁶⁹ Xuan-Thao N. Nguyen, *Collateralizing Privacy*, 78 *Tulane Law Review* (2004), 553-603, at 554.

¹⁷⁰ *Eod. loco*, p. 602.

¹⁷¹ Daniel J. Solove, *Privacy and Powers: Computer Databases and Metaphors for Information Privacy*, 53 *Stanford Law Review* (2001), 1393-1462, at 1411. On the cookies, see also Lessig (note 36), p. 34, 41; Conseil d'Etat (note 108), p. 35; Trudel (note 103), p. 238; Castells (note 39), p. 216. The use of cookies is dealt with in preamble (25) of the CE Directive 2002/58.

established doctrine of personal jurisdiction law supports the result reached by the district court.¹⁷²

Since in most cases both parties are not residents of the same state, the claimant often lodges his or her claim before a federal court on the basis of diversity of citizenship (Article III, section 1 of the Constitution). In order to protect the defendant against the obligation to plead before the court sitting in a state with which he or she as no contact, case law requires the existence of sufficient contact of the defendant with the contemplated federal court. But this criteria is not easy to apply to a firm acting online since it entertains contacts with all jurisdictions where its messages are received. The consequence is that the courts have been divided on the application of the notion of sufficient contacts to defendants operating in the cyberspace.¹⁷³ The jurisprudence is divided between courts which accepted their jurisdiction¹⁷⁴ and others which declined it.¹⁷⁵

Domain names litigation

Since the computerized address is made of a combination of numerals registered according to the Internet Protocol system, it does not immediately denote the domain of activity of the addressee. The *Domain Names System* allows to use a known denomination familiar to the customers which can be used as an address which will be brought in harmony with the Internet Protocol on Internet.

Domain names are registered on Internet by *Network Solutions, Inc.* (NSI), the sole contractor of the *National Science Foundation* (NSF).

¹⁷² *Bensuram Restaurant v. King*, 126 F 3d 25 (2d Cir 1997).

¹⁷³ For an analysis of case law: Berman (note 117), p. 414-417; Perritt (note 122), p. 14-23; *Note A Category-specific, Legislative Approach to the Internet Personal Jurisdiction Problem in United States Law*, 117 *Harvard Law Review* (2004), 1617-1638.

¹⁷⁴ *Compuserve, Inc. v. Patterson*, 89 F 3d 1257 (6th Cir 1996) ; *Inset Systems, Inc. v. Instruction Set, Inc.*, 937 F Supp 161 (D. Conn 1996); *Maritz, Inc. v. Cybergold*, 947 F Supp 1328 (ED Ma 1996); *Zipp Mfg Co. v. Zippo Dot Com., Inc.*, 952 F Supp 1119 (WD Pa. 1997); *Direction, First Church of Christ, v. Nolan*, 959 F 3d 209 (4th Cir 2001).

¹⁷⁵ *Bensuram Restaurant v. King*, 126 F 3d 25 (1997), confirmed 937 F Supp 295 (SDNY); *Online, Inc. v. Huang*, 106 F Supp 2d 848 (ED Va 2000); *Pavlovitch v. Superior Court of Santa Clara County*, 139 Cal Rpts 2d 769 (2001).

NSI is not liable for contributory negligence if the right of a third party is infringed by the registration.¹⁷⁶ The sole remedy is to lodge a claim against the individual or the enterprise who has infringed a legal right. The Court of appeals of the 9th Circuit has stigmatized the defendant who had registered numerous domain names and who agreed to 'cede' to the claimant the domain name belonging to him on payment of 13.000 \$. Indeed, the NSI registers domain names 'on a first-come, first serve basis'.¹⁷⁷ When the alleged infringement concerns a likelihood of confusion or mistake between the claimant's mark and the Internet site name of the defendant, the claim is dismissed if the risk of confusion is not demonstrated.¹⁷⁸ Even if a domain name is no more than data, courts – as much as a legislative body – can make data property and assign its place of registration as its *situs*.¹⁷⁹ The protection of domain names is specifically provided for by the *Anticybersquatting Consumer Protection Act* (ACPA).¹⁸⁰ As a property the unlawful access to an Internet database is characterized as a 'trespass to chattels'.¹⁸¹ It can also be garnished.¹⁸² The story of privatisation of the Domain Names System has been recorded in *PG Media, Inc. v. Network Solutions, Inc.*¹⁸³

European case law has also dealt with domain names litigations. According to the Swiss *Tribunal Fédéral*, the registration of a domain name which is protected by another's appropriation can be considered as an act of unfair competition.¹⁸⁴ An Italian court has also condemned

¹⁷⁶ *Lockheed Martin Corp. v. Network Solutions, Inc.*, 194 F 3d 980, at 987 (9th Cir. 1994).

¹⁷⁷ *Panavision International L.P. v. Toepfen, Network Solutions, Inc.*, 141 F 3d 1315, at 318 (9th Cir 1998).

¹⁷⁸ *The Customer Co. v. E-Commerce Today, Inc.*, 16 F Supp 2d 869 (WD Va. 2000).

¹⁷⁹ *Caesars World, Inc., v. Caesars-Palace.com*, 112 F Supp 2d 502, at 504 (ED Va 2000).

¹⁸⁰ 15 USC § 1125 (a) (ii). The provision has been applied in *Caesars-World* (note 179), in *Heathmount A.E. Corp. v. Technodome.com*, 10 F Supp 2d 860, 868 (ED Va 2000) and in *Online, Inc. v. Huang*, 106 Supp 2d 848 (ED Va 2000).

¹⁸¹ *Register.com, Inc. v. Verio, Inc.*, 126 F Supp 2d 238, 249 (SDNY 2000).

¹⁸² *Network Solutions, Inc. v. Umbro International, Inc.*, 259 Va 759, 529 SE 2d 80 (Va. 2000).

¹⁸³ 51 F Supp 2d 389 (SDNY 1999). See also: Zittrain (note 104); Clerc (note 104), p. 361, 365-367.

¹⁸⁴ Trib. Féd., 2 May 2000, *Bernerobderland, Arrêts du Tribunal fédéral*, 126, III, 239. In absence of any specific legislation, the formulation of Internet addresses does not fall into a space deprived from any law (p. 244).

the use as a domain name (*denominazione di sito*) of the mark belonging to another person.¹⁸⁵ Defamation through Internet whose victim is an Italian resident can be repressed even if the message emanates from a foreign country.¹⁸⁶ In Belgium, hackers are legally liable when they gain unauthorized access to a computerized system.¹⁸⁷ In Germany a judgment of the Superior Court of Justice dismissed the action lodged by a dentist against a colleague who was advertising his practice on his homepage. Not only is the publicity of physicians allowed by German law but the consultation of a message on Internet needs a spontaneous research of information by the consumers.¹⁸⁸ There are also some German judgments on Auction-Internet.¹⁸⁹ The litigation on domain names gave also rise to some judgments in France.¹⁹⁰

Conflict of law and conflicts of jurisdiction in the cyberspace

Since the Internet is an interstate or international venture, it often occurs that a message sent in a country is received in other countries. The sender cannot forecast what place his emission has reached and by whom it was received. Article 4 of directive 95/46 of 24 October 1995 determines the applicable national law. The basic localization is in the country where the treatment is effectuated. That rule is sensible, since the individuals or the enterprises which engage in an internet program have principally to abide by the laws in force in the country where they exercise their activity. But nothing can prevent any State to extend its civil or penal jurisdiction to facts having effect on its territory, in the case of Internet to apply the law of the country where the message has

¹⁸⁵ Tribunale Napoli, 10 June 1997, *Foro italiano*, 1998, I, 923.

¹⁸⁶ Cassazione (Italy), 5 a sezione penale, 17 November 2000, Dulberg Moshe.

¹⁸⁷ Correctionnel Bruxelles, 8 November 1990, *Bistel*, *Journal des Tribunaux* 1991, 11 ; Correctionnel Eupen, 15 December 2003, *Revue du Droit des Technologies de l'Information*, n° 19, September 2004, p. 61.

¹⁸⁸ Bundesgerichtshof (BGH), 9 October 2003, *Neue Juristische Wochenschrift* (NJW) (2004), 440. It strikes down a judgement of the Oberlandsgericht Cologne.

¹⁸⁹ BGH 13 November 2003, *NJW* 2004, 834; 7 November 2001, *NJW*, 2002, 363; Landgericht Berlin, 1 October 2003, *NJW*, 2003, 3493.

¹⁹⁰ Paris, 8 October 2003, *Somm. Dalloz*, 2004, 1157, obs. Yvan Auguet ; Tribunal de Grande instance, Paris, 14 September 2004, *Dalloz*, 2004, 2647; Rennes, 10 February 2004, *Dalloz*, 2004, 1808.

been received. That solution is traditional in private international law with the concurrent jurisdiction of the place where the wrong has been done and the places where the damage is suffered. Moreover, in cases of wrongs done from a distance, both places can be considered as the place of action. Libel is a case at hand: when the libellous words or the libellous image are sent through the air, the sender is also acting in the place of reception.

Website libel cases raise in the United States the question of prescription: according to the single publication rule the delay is running from the date of the first publication, which means the moment where the libel appeared for the first time on its own site.¹⁹¹ Defamation in a daily paper published at New Haven is broadcasted through Internet.¹⁹² Spamming is also linked with both the sender and the receiver place¹⁹³ as unloading of a Webpage to canvass the persons identified on that page.¹⁹⁴ Threatening messages sent through the Net have been considered as a violation of 18 USC § 875 (C). But since the message constituted 'shared fantasy', the Government's actions petered out.¹⁹⁵

Private international law tolerates alternative jurisdiction: both states are entitled to adjudicate a case having contacts with either State. When the conflict rises up to constitutional provisions States' sensitivity risks also to arise. It is what occurred in the French-American relationships on the *Yahoo !* case. In France as in other continental countries, racist speech and the apology of the Third Reich is banned from the media. As is easy to understand German courts are particularly sensitive to the problem.¹⁹⁶ The incrimination of the German Penal Code has been applied to a message sent from an Internet site in Australia.¹⁹⁷ The

¹⁹¹ *Simon v. Arizona Board of Regents*, 28 *Media Law Review* 1240 (Arizona Sup. Ct. 1999); *Firth v. State of New York*, 706 NYS 2d 835 aff'd, 731 NYS 2d 244; 775 NE 2d 463 (2002). See also: *Schapp v. McBride*, 64 F Supp 2d 608 (E.D La 1998); *Telnikoff v. Matusevich* 702 A 2d 230 (Md 1997). In the doctrine: Sapna Kumar, Website Libel and the Single Publication Rule, 70 *The Univ. of Chicago Law Review* (2003), 639-662; Beverley Earle, International Cyberspace: From Borderless to Balkanized net, 31 *Georgia Journal of International and Comparative Law* (2003), 225-263, at 242-250.

¹⁹² *Young v. New Haven Advocate*, 315 F 3d 256 (4th Cir 2002).

¹⁹³ *Compuserve, Inc. v. Patterson*, 89 F 3d 1257 (6th Cir 1996).

¹⁹⁴ *Direction, First Church of Christ v. Nolan*, 259 F 3d 209 (4th Cir 2001).

¹⁹⁵ *United States v. Juke Baker*, 890 F Supp 1375 (ED Mich. 1995).

¹⁹⁶ BGH, 26 February 1999, *NJW* 1999, 1561; 6 April 2000, *NJW* 2000, 2217.

¹⁹⁷ BGH 12 December 2000, *NJW* 2001, 624.

Tribunal de Grande instance of Paris did enjoin the diffusion in France of the list of Nazi artefacts sold through the intermediary of a major American access provider, *Yahoo !*¹⁹⁸ *Yahoo !* reacted by requesting an American federal court to enjoin it from executing the French judgement. A district court sitting in California did grant that injunction.¹⁹⁹ Since the French judgment did precede the American action, the district court based its decision on the question of recognition of a foreign judgement. It did lean on the Comity doctrine applied by the Supreme Court of the United States in an old famous Franco-American case, *Hilton v. Guyot*.²⁰⁰ In that case a French judgment could not be enforced in the United States under the doctrine of Comity since a French court would not recognize an American decision in similar circumstances: reciprocity should be a fundamental element of the Comity doctrine. However *Hilton v. Guyot* is not a very persuasive precedent. Not only was it pronounced at a sharp majority (5 v. 4, the minority being led by Chief Justice Fuller) but the Supreme Court of New York State said that it was not bound by *Hilton* in a case where it succeeded in distinguishing it from the case adjudicated by the Supreme Court of the United States.²⁰¹ Moreover according to American specialists of private international law, the Uniform Foreign Money-Judgments Recognition Act has reversed the precedent “to eliminate the absurd ‘retaliation’ rule”²⁰²

In the *Yahoo !* case, the district court characterizes Internet in the following terms:

¹⁹⁸ Tribunal de grande instance de Paris (référé), 20 November 2000, *Association Union des Etudiants juifs de France, the Ligue contre le Racisme et l’Antisémitisme, the MRAP (voluntary intervention), v. Yahoo ! Int. and Yahoo ! France*, www.legalis.net/jnet/decisions/responsabilite/ord.tgi-paris-201-100-hmt.

¹⁹⁹ *Yahoo ! Inc., v. La ligue contre le racisme et l’antisémitisme*, 169 F Supp 2d 1181 (ND Cal. 2001).

²⁰⁰ 159 US 113 (1895).

²⁰¹ *Johnston v. Cie Générale Transatlantique*, 242 NY 381, 152 NE 121 (1926).

²⁰² Robert A. Leflar, *American Conflicts Law* (3d ed. The Bobbs-Merrill Co, Inc., 1977), § 84, p. 251-253. See also: Eugene P. Scoles and Peter Hay, *Conflict of Laws* (2d ed., 1982), ch. 24, note 2 ; Roger C. Cramton, David P. Currie, Herman Hill Kay and Larry Kramer, *Conflict of Laws* (5th ed., West Publishing Co, St Paul, Minnesota, 1993), ch. 8 (8), p. 716. Other scholars underline the strong dissent already handicapping the force of precedent of *Hilton v. Guyot*: Gene R. Shreve, *A Conflict-of-Laws Anthology* (Anderson Publishing Co. Cincinnati, Ohio, 1995), p. 42-43; Eugene F. Scoles, Peter Hay, Patrick J. Borchers, Symeon C. Symeonides, *Conflict of Laws* (2d ed., 2000, West Group, St Paul, Minn.), § 24.3.

What makes this case uniquely challenging is that the Internet in effect allows one to speak on more than one place at the same time. Although France has the sovereign right to regulate what speech is permissible in France, this Court may not enforce a foreign order that violates the protection of the United States Constitution by chilling protected speech that occurs within our borders.²⁰³

The specificity of Internet is not adequately expressed in that extract from the judgment: other media allow “one to speak on more than one place at the same time”. It was already the case with radio and television broadcasting.

State coercion needs a physical object, a 'thing' upon which the authority can lay its hand. This is the case with books or newspapers that can be attached. At the receiving end of a television broadcast there is nothing to be attached but for the television set if it is prohibited to possess one. If a dictator wishes to forbid the diffusion of foreign messages on his territory, he can only do it through threatening his citizens with penal measures. The case of Internet is different: the reception of a message sent from abroad is operated through access providers who are acting on the territory of the State where the message is received. It makes sense to enjoin access providers (*Yahoo ! France*, for instance) from cooperating with the diffusion of illicit messages. On the other hand it does not make sense to localize the freedom of speech in a territory more than in another. Speech as an expression of human mind is immaterial, its media have a territorial grafting, speech itself does not. Since 'the medium is the message', the message of Internet is to extol the freedom of speech through a medium which is both material and immaterial and which condemns any attempt to localization.

The interstate conflict which has arisen in the *Yahoo !* case is not an ordinary conflict of laws. It is a conflict of constitutional values. The prohibition of hate speech and more specially of an apology of the Nazi regime is an obligation for the States that have adhered to the International Convention on all forms of racial discrimination signed in New York on 7 March 1966. The duty to implement that treaty has a constitutional value equal to the freedom of speech. Moreover

²⁰³ 169 F Supp 2d 1192.

American constitutional law allows restrictions to the freedom of speech. The prohibition of hate speech could be as good an exception as defamation or public security.²⁰⁴ The only solution applicable to a medium characterized by its deterritorialisation is to agree upon a universal principle, the freedom of speech, which is congenial with that medium and to agree upon common exceptions, one of which could be the prohibition of hate speech.

Fortunately, the judgment of the district court has been reversed by the United States Court of Appeals of the ninth Circuit.²⁰⁵ The appeal judgment contains a comprehensive evaluation of the French law and of the proceedings engaged by the French ONGs:

France is within its rights as a sovereign nation to enact hate speech laws against the distribution of Nazi propaganda in response to the terrible experience with Nazi forces during World War II. Similarly, LICRA and VEJF, are within their rights to bring suit in France for violation of French speech law.

However, the Court of Appeals did not dismiss the action of *Yahoo !* on the merits. It did so for a jurisdictional reason. French organisations have not to defend themselves before an American court if there does not exist 'contacts' with California as a basis of personal jurisdiction. As long as the French defendants have not tried to enforce the French

²⁰⁴ In favour of the insertion of hate speech in the list of messages which are not protected by the First Amendment, see for instance: Berman (note 117), p. 517-519; Mark F. Kightlinger, *Cyberspace Conflicts Law: A solution to the Yahoo ! Problem ? The EC E-Commerce Directive as a Model for International Cooperation on Internet Choice of Law*, 24 *Michigan Journal of International Law* (2003), 719-766. Contra: Mathias Reiman, *Special Feature: Cyberspace Conflicts Law: Introduction: the Yahoo ! Case and Conflicts of Law in Cyberspace*, *eod. loco*, 663-672; Molly Van Houweling, *Spared Feature: Cyberspace Conflicts Law: Enforcement of Foreign Judgments, the First Amendment and Internet Spread: Notes for the New Yahoo ! v. Licra*, *eod. loco*, 697-712; Earle (note 191), p. 230-232. Among French scholars Balle (note 67), p. 542-543; Cyril Rojinsky, *Cyberspace et nouvelles régulations technologiques*, *Dalloz*, Chron. 2001, 844-847; Caprioli (note 104), n° 49; Cachard (note 104), n° 100, n° 368, n° 689-694.

²⁰⁵ *Yahoo !, Inc., a Delaware Corporation, v. La Ligue contre le Racisme et l'Antisémitisme, a French association, l'Union des Etudiants juifs de France, a French association*, 379 F 3d 1120 (9th Cir 2004). The judgment has been vacated on 10 February 2005 and a rehearing en banc has been granted: 399 F 3d 1010 (9th Cir, 2005).

court's decision in California they are not liable to answer for what they have done in France. The Court of Appeals concludes that "the District Court did not properly exercise personal jurisdiction over LICRA and UEJF".

Conclusion

(1) Internet as a medium going along with other media

The concurrence of various messages of unequal velocity is a traditional problem of the law of contracts. What if a telegram annulling or revoking a promise sent by letter reaches the addressee before the letter? Is the sender bound by the promise or not? What moment has to be taken into account, the date of the sending or the date of the reception of the message?

The *Gruber* case which was brought before the European Court of Human Rights illustrates the possible influence of the diffusion of a message through Internet on the action brought against another medium. Doctor Gruber was the physician of François Mitterand up to the latest illness of the French President. Immediately after the death of his patient he published a book entitled *Le Grand Secret*, where he disclosed the circumstances of the fatal illness and other informations on private circumstances of the deceased former president. The book came out on 10 January 1994, it was the work of Dr Gruber and a journalist, Michel Gonod. Mitterand's heirs brought a claim against the authors of the book as against its publisher. Only a week after the launching of the action a cybercafé of Besançon placed the entire content of the book on the Net. A provisional judgment of the Tribunal of Paris condemns the defendants and bars further selling of the book. That judgment is confirmed by the Court of Appeal of Paris.²⁰⁶ Later on, the Tribunal of Paris gives the prohibition a permanent nature and is confirmed by the Court of Paris.²⁰⁷ While the judgments of the Court of

²⁰⁶ Paris, 13 March 1994, *S^{té} Ed. Plon v. Consorts Mitterand*, *La Semaine juridique*, Ed. G., n° 19, 22632 on the order of the Tribunal de grande instance of Paris (référés), 18 January 1994.

²⁰⁷ Tribunal de grande instance, Paris, 23 October 1994, *La Semaine juridique* (JCP), Ed. G, n° 21, 22844, 1997; Court of Appeal, Paris, 27 May 1997, *eod. loco*, n° 34, 22894.

Appeals of 13 March 1994 and of the *Tribunal de grande instance de Paris* of 23 October 1996 are alluding to the divulgation of the content of the book through various media in spite of the injunction addressed to Doctor Gruber and to Plon, the final decision (Paris, 27 May 1997) does not contain any hint at such concurrence. After its condemnation, the publishing house Plon, submits a request to the European Court of Human Rights for violation of the freedom of expression and of publication guaranteed by Article 10 of the Convention. The defendant Government can rely on the restrictions authorized according to paragraph 2 of that Article: the protection of privacy and of the professional secret. The journalist who had been condemned by the *Tribunal correctionnel* of Paris on 5 July 1996²⁰⁸ for his breach of professional secret, took no part in the civil suit.

The European Court of Human Rights delivered its judgment on 18 May 2004. The main argument in favour of the French Government is the protection of the professional secret which may not be violated even when the patient is a 'public figure' of the utmost importance. But the Court draws a distinction between the injunctions issued on a provisional basis in the first weeks following the publication of *Le Grand Secret* and the upholding of that decision some years later. To motivate that distinction, the European Court takes into consideration the concurrent divulgation on Internet which the French courts had practically disregarded. On that point the defence of the French Government is almost naïve: the person liable for the diffusion on Internet is not identified, it is possible that he or she operated from a foreign country which prevents the French authorities from any legal action.²⁰⁹

The claimant's argument seems to have been accepted by the Court: at the moment when the president of the *Tribunal de grande instance* did issue its injunction, forty thousand copies of the book had been sold, its content was available on Internet and had been largely commented by the press.²¹⁰ Even if it was justified to prohibit the diffusion of the book during the first week following Mitterand's death out of respect for the feelings of his family, the upholding of such an injunction later on is a grave violation of the freedom of expression

²⁰⁸ *Le Monde*, 19 February 2005, p. 7 and the leader, p. 15.

²⁰⁹ European Court of Human Rights, 18 May 2004, *Plon (société)*, v. *France*, Req. N° 58148/00, § 38.

²¹⁰ *Eod. loco*, § 40.

since it had lost any justification when the confidentiality of the professional secret had been largely dispelled.²¹¹

(2) State's powerlessness with regard to Internet

Books and written press, even broadcasting can be curbed by State's protective measures while Internet is occupying a non-territorial space where the exercise of state coercion seems almost helpless. The example taken from online gambling which has revealed itself out of bounds of American prohibition gives a strong confirmation of such powerlessness.

A recent French case where ONGs tried to struggle against hate-speech in a purely internal framing is also demonstrative of the abusive attitude of Internet professionals. Some French access providers have been enjoined by a provisionary judgment of the *Tribunal de grande instance* of Paris to diffuse a 'negationist' site. The connection to the site *Aaargh* is prohibited.²¹² However the effectiveness of such filtering techniques is all the more problematic since it is easy to delocalise the site or to replace it by another. When addressed to a determined service provider, the judgment has not to be performed by any other. In the *Gruber* case, the tribunal de Grande instance of Paris falls into the same illusory trap: it makes a reproach to an internet site of having disseminated *Le Grand Secret* after the publishing house Plon had been enjoined from selling the book. But such judgment is only to be enforced by Plon and by Dr Gruber, it does not issue any order to persons or enterprises who did not participate in the proceedings.

(3) Internet and entropy

Just as energy is dissipated through a phenomenon called entropy, Internet is, in the sphere of information, producing an entropic consequence: messages are disseminated out of control of the sender, they are losing their lisibility but they also take refuge in a non-space where territorial organizations like the States are becoming less and less empowered to let prevail the rule of law.

²¹¹ *Eod. loco*, § 53.

²¹² *Le Monde*, 15 June 2005, p. 10.

There is no way out of anarchy. The rules of conduct laid down by service providers pay a lip-service to the intention of moralizing the milieu. Privacy laws try to equip the individuals with causes of action after their fundamental rights have been violated. But such rights have not been made great use of. There was no period in human history where privacy has been so much talked about and none where that fundamental right has been so bluntly trampled down. Victims of any sort – of crimes, of natural catastrophes – are almost always prone to answer solicitations from the media.²¹³ At the same pace as the right of privacy, the right of publicity, *i.e.* the faculty of making money from one's image or private occurrences has grown. With the dislocation of families and of natural ties between human beings, most men and women resent their solitude in massified collectivities. Internet offers a way out, even at the price of privacy.

²¹³ See of instance: Guy Debord, *La Société du Spectacle* (1re éd., 1967, 3e éd., 1992).

Scientific Collaboration and the 7th Framework Programme: ALLEA's View

Pieter J.D. Drenth*

Scientific collaboration in Europe

Scientific collaboration in Europe is increasing sharply, not only because of the European Framework Programme funding for cooperative projects, but also because science itself has developed into a truly collaborative and international activity. One can no longer readily do good scientific work in a remote place without regular contact with colleagues. New communication technologies have made international cooperation much easier, resulting in research proposals and activities becoming increasingly international in nature.

There are several reasons why we *should* collaborate more than before. Originally the argument of the European Commission in supporting the collaboration in research was rather pragmatic/economic. It was argued that Europe needs to strengthen its *competitive position* worldwide and especially relative to the United States and Japan. The quality of its education and research, which can indeed compete with the United States. However, Europe falls really short if one looks at how effectively all that knowledge and insight are translated into industrial applications, patents and other forms of technological utilization when compared with the United States and Japan. That argument is still valid presently. The crucial translation of scientific research is truly lacking in Europe. The difference in output in terms of industrial development is uncomfortably large and still growing; and increased cooperation and harmonization are needed.

In the meantime also more and variegated arguments for collaboration have been brought to the fore in addition to the foregoing economic/ competitive point of view.

The first argument is that many of our highest priority issues have a truly international character. One cannot study environment, infectious diseases, transportation, trade, migration or economic recession from a

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purely national perspective. We have to collaborate to get a full picture of many pan-European policy issues, be it climate change, the effects of migration and the presence of minorities in many European societies on the national as well as the European civic society, the effects of viruses and infectious diseases because of the greater mobility of the citizens, energy and the possible use of nuclear power, or the vaccination against live stock diseases, genetically modified food or other topics that have an international character but are at the same time controversial and difficult to meet with agreement. This 'trans-national' requirement of research is particular conspicuous in regional collaborative programmes, as will be shown below.

Secondly, only at a higher (*e.g.* EU-) level of aggregation can research create the required critical mass that individual countries often fail to achieve. In the smaller countries it is not always easy to find the top level researchers in sufficient quantities. If one can cross the national borders in such a search the chance of composing successful groups is of course much higher.

Thirdly, collaboration helps to create and to enhance research skills and knowledge in a wider Europe by bringing junior researchers from different regions in contact with cutting edge research, and thus improve the European research capacity. This for instance has been the secret behind the success of the EC's Madame Curie programme.

Fourthly, national funding alone often falls short of what is needed for many of the mega-programmes and only combined efforts can provide the necessary infrastructure and means. The co-ordinated analysis of Europe's needs in terms of infrastructural facilities as well as the Road Map developed by the European Strategy Forum on Research Infrastructure (ESFRI) should be seen as a welcome step towards co-ordinated development of an infrastructure of European interest. By the way, here is another reason to support an increase in EU funding; it will also stimulate the further (badly needed) private investment in research in Europe.

Fifthly, international collaboration stimulates improved integration of the currently often fragmented and duplicating research in the various European nations, and to the co-ordination of national strategies. Moreover, it leads to a much wider dissemination of results than is realised with respect to national research.

And last but not least, there is a *moral obligation* for Western, economically more advanced countries to strengthen the R&D capa-

bilities of economically less-advantaged countries, including a number of (central and eastern) European countries. This obligation certainly applies to the economically really deprived countries such as is often found in the third world. In the long run, such collaboration is the best precondition for peaceful coexistence and economic balance of the world as a whole, and thus beneficial for all. We will come back to this point later.

The message is clear: scientists and scholars in Europe must cooperate, and the institutions that have responsibility for, or at least have the task to stimulate research, such as the national academies (and *a fortiori* associations of national academies, such as ALLEA), have to encourage, and where possible, facilitate such collaboration.

Funding

In view of these strong arguments regarding the importance of EU intervention in research funding, and given the far too high a percentage of rejections - even of research proposals judged to be very good - under the previous Framework Programmes, as well as the significant enlargement of the number of potential participants in the 25-member-state Europe, and the urgent need for new research, ALLEA ardently supports the proposal to double the EU research funding

It is clear that the promotion of European research can be defended on economic/utilitarian grounds because of its undeniable contribution to the economic and technological development and social welfare of a society. In the proposals for the 7th Framework Programme it is stated that that the stimulation of research and development is one of the crucial conditions for the realisation of the Lisbon objectives. We wholeheartedly agree. Europe will only achieve competitiveness and leadership on the global market if it takes the lead as a knowledge economy and society. The development of knowledge - and especially new knowledge - is a *sine qua non* for the future of Europe.

But, as said, it will be short-sighted to restrict the justification of research to this utilitarian motives. There is also what can be called *intrinsically* relevant research: research, be it in sciences or in the humanities, that leads to an augmentation of the body of knowledge, which is an intrinsically valuable and precious quality of civilisation.

Moreover, such an augmentation has an important educational impact with respect to the next generation of scientists as well as the broader community. The scientific enlightenment of the general public can, in fact, be regarded as an important instrument with which to develop and to strengthen the intellectual defensibility and the democratic foundation of a society.

New Instruments for collaborative research

In FP 6 new instruments were introduced, such as Integrated Projects (IP) and Networks of Excellence (NoE). It is understood that the use of these instruments will be continued in the next Framework Programme. We note that the distinction between the nature of and the criteria for the two instruments and between these criteria and those of other FP activities is not always sufficiently clear, and we suggest making the goals of the two instruments more distinctive and specific.

Secondly, it appears, or at least this is the perception in the scientific world, that the New Instruments should be very large. Of course, there should be some critical mass, but the optimal size depends on the subject, the potential participants and the added value, and this could differ substantially over disciplines. The suggestion that ‘big is beautiful’ creates a further bias in favour of established research groups, and diminishes the chances of innovative, daring and risky proposals.

This biased suggestion does not only apply to the IPs, but also to the NoEs. Here, again, it can be argued that smaller networks, as particularly found in social and behavioural sciences and the humanities, can be of top quality and deserve recognition as well.

In addition, with respect to the Networks of Excellence, more exclusive emphasis should be put on excellence. Up to now, a multitude of additional criteria and considerations seem to have been applied, including political criteria, representativeness for the whole of Europe, considerations of cohesion and integration, ethical issues, gender distribution, and others. In keeping with the concept, NoEs should primarily emphasise excellence. Moreover, one should not be too rigid about the duration of networks. Sometimes they have to continue for a fairly long time, sometimes it is advisable to allow a shorter duration, depending on the subject and the dynamics within the

network. In general, sufficient flexibility and adaptation to external circumstances should be allowed.

A final remark: the new instruments may have proven their worth, but not as a panacea for all problems in collaborative research. The excellent classic single collaborative projects deserve a suitable place in the next period as well.

Joint technological initiatives

ALLEA does recognise the importance of its findings' industrial and societal application. And the involvement of industry herein is crucial. So far, industry has been disinclined to invest in research unless the right regulatory framework and conditions for production and marketing of the end products are provided. It is in respect of the latter that many companies have remained hesitant. The creation of the EU's technology platforms, launched some years ago, raised hopes that change would be made and that companies would increase their investment in research. Within such platforms, stakeholders from industry, academia, governments and the European Commission jointly work out a research agenda for various sectors in Europe. ALLEA welcomes the intention of the EC to continue this initiative in KP7 in the form of joint technology initiatives. It must be added that also in the next FP the success of these platforms depends on both the vision and quality of the programme, and the extent to which the players 'industry' and 'academia' take this process seriously. A careful selection and articulated definition of the major challenges, a clearly felt need for such a platform, strong political support, high visibility and level of acceptance, and a constructive collaboration between academia and industry are important conditions for the technology platforms' success. Only then will the programme attract additional national support and industry funding.

Co-ordination of national programmes

We have noted with interest that the efforts to improve the co-ordination of national research programmes have been successfully applied in the 6th FP. The ERA net scheme was quite an achievement

and certainly deserves continuation and further strengthening. We also approve the plans to not only support the costs of co-ordination, but also part of the project costs for those ERA-NET projects that will change to joint calls.

Advantages of the ERA-NET+ proposal for the National Research Councils are obvious: the experience of international collaboration and the compulsory obligation to clear the hindering barriers to such collaboration, the achievement of scale and scope in science-driven research, the optimal nurture and growth of excellence, the creation of promising career paths for (young) researchers, and the organisation of a European system for review, and benchmarking and best practices in the evaluation and selection of the most promising proposals. The proposed course deserves support for all these reasons.

ALLEA also assents to EU financial support being given to the European intergovernmental research organisations' activities (CERN, EMBL, ESO), particularly those activities that are beneficial to the European Union. It is important to strengthen the ties between these institutes and the Union.

International cooperation with non-EU countries

The part of the FP7 proposal on international co-operation deserves support and, possibly, strengthening. The internationalisation of research cannot and should not be restricted to the European Union countries. Scientific collaboration already occurs between EU member and *non-EU-member European countries*, and this should be further encouraged. Such a support would not only strengthen new candidate EU member countries' intellectual research capacity and experience, but also provide the opportunity to enjoy the benefits of collaboration with neighbouring countries, and thus make optimal use of the intellectual resources in the greater Europe. In fact, the proposal speaks of intentions to further encourage and stimulate regional co-operation. This is a laudable idea that we have endorsed also in a discussion on the potential benefits of regional collaboration in the Balkan area (see Drenth, 2004). Having both EU member and non-EU-member countries represented in such regional networks, if required for economic and geographical reasons, should not be excluded.

In addition, as said in the first section, the international collaboration should be extended to *non-European* countries as well. First of all in the context of world-wide programmes such as global change, space research, world health and food problems, research on terrorism and others, in which Europe should actively participate. Secondly, more specifically with respect to research issues and areas that are politically or economically important to Europe, and in which an exchange of knowledge and an influx of non-European experts would be beneficial for the advancement of scientific knowledge in Europe. Thirdly, Europe should welcome collaboration with ambitious and well trained researchers from emerging economies like China and India, that are (becoming) important industrial and trade partners as well as fast growing consumer markets for European products.

In this connection a special plea should be made for collaboration with *developing countries*. European research and knowledge could contribute to the alleviation of the large social, environmental and health backlogs in these countries. Co-operation activities are envisaged in the areas of sustainable development, sustainable use of natural resources, including agricultural production and food security, environmental and energy aspects, and health and nutrition. Furthermore, at present many European countries already have bilateral agreements and programmes with developing countries, but the highly fragmented existing system of co-operation could be significantly improved by European co-ordination and collaboration in this respect. To date this collaboration is often characterised by assistance in training and research, infrastructure support and providing information. But this assistance can gradually help these countries to develop their own S&T capabilities, so that in the longer term they may become true co-operation partners.

Such assistance and support is partly for Europe's own benefit: stimulating developing countries to study global problems in which they are (sometimes heavily) involved, expanding knowledge of health issues and diseases that may effect Europe through increasing migration and travel, improving living conditions to reduce the economy-driven migration, and growing markets. But this assistance should also stem from feelings of solidarity and a genuine desire to see improvements in the well-being of poor populations. Collaborative research may offer these populations help in the form of applicable knowledge and skills to overcome the difficulties caused by economic

stagnation, natural disasters and social, educational and medical deprivation.

Regional collaboration

What does the foregoing mean for regional collaboration? Let us list a number of considerations in this respect:

- Research on many problems that needs to transcend the limits of one nation and has an international character can or should be studied from a regional perspective. One may think of geological and climatological studies, migration and minorities, the historical, linguistic and cultural roots of ethnic groups, industrialization and environmental effects, agriculture and food, infectious diseases, and many others. Regional cooperation is the appropriate way.
- The same is true for collaboration with respect to infrastructural costs of advanced facilities. Regional collaboration could mitigate the problem of lack of finances, and still allows easy access.
- Countries in regions should also bundle their educational and training facilities more than before. Smaller countries cannot excel in every field of science and scholarship, but jointly they can, of course, offer more opportunities. This is, therefore, a plea for higher regional cross-national mobility. It is clear that this is not only in the hands of scientists and educators: legal provisions restricting free study and work and visa regulations have to be adapted as well, but pressure from universities and academies will help.
- Countries in certain region's collaborating consortia would also be stronger partners in exchanges and collaborations with other EU member states with an often strong scientific tradition and support. At present some of the smaller and economically less advantaged countries have quite a few exchange and collaboration agreements with stronger European countries, but their lack of size and modest facilities generally put them at a disadvantage. Stronger regional collaboration in research and education will increase their critical mass, broaden their scope and present them more readily as fully-fledged partners.
- Some regional countries have a number of serious problems in common: stagnating economic growth, unemployment, little technological innovation due to limited financial and human resources, and fragmentation of the efforts to meet these problems. In fact, many

of these problems occur in the wider Europe as well. It has been acknowledged that world-class scientific research and development are essential for Europe's future prosperity, but there is also agreement that the successful integration of such R&D into the fabric of European society (homes, supermarkets, industry, transport, health systems etc.) is a *sine qua non* for delivering benefits. The European Commission has proposed the sector-by-sector-based European technology platforms. There is no reason why this idea of an Innovative Initiative for the whole of Europe could not be successfully applied with respect to regions within Europe as well. It could then aim at the more specific regional opportunities and obstacles and could be of optimal benefit for that particular part of Europe.

The use of structural funds

The effect of promoting top quality through the ERC scheme could keep a great many struggling research groups from economically less privileged countries locked into an unfortunate position, and could mean that a great many parts of Europe will be deprived of European financial support for research for some time, creating a "science divide" between the haves and have-nots. The European Commission has addressed the role of the regions in the overall ERA building process (COM 549(2001) final), stating that Regions should emerge as dynamic players in developing and structuring the European Research Area. According to the Commission, geographical proximity remains one of the most powerful factors stimulating intellectual and commercial exchanges and, consequently, the innovation process. The so-called solidarity instruments, the Structural Funds [European Regional Development Fund (ERDF, 1975), European Social Fund (ESF, 1958), European Agricultural Guidance and Guarantee Fund (EAGGF, 1958), Financial Instrument for Fisheries Guidance (FIFG, 1993)] and the Cohesion Fund (environment and transport, 1993) are intended to narrow the development gap among the regions and Member States of the EU. Some €36 billion (about one third of the EU budget) was spent through these funds in 2004. The use of structural funds for R&D development would be in line with the Committee of the Regions' point of view that welcomed the Commission's proposals that RTD should become one of the most important priorities for the New Structural

Funds 2007-2013. The Committee stressed the need to support basic research on the one hand and to reach a fair balance in R&D opportunities between European regions on the other. In other words it stressed the significance to differentiate between FP research funding and Structural Funding. The former 'must promote research' and the latter should be used 'to remove the regional imbalances in research, innovation, training facilities and infrastructure'. There is one aspect that may require further concerted action by academies, universities and research institutes in the region. We know that Member States have the last word in terms of priority setting with respect to the spending of the Structural Funds, despite the fact that the Commission can make strong recommendations on the appropriateness of these choices. It is crucial to convince the recipient states of the importance of investing in R&D, and to reserve a significant part of their revenue for this purpose. Governments need to be convinced of the absolute importance of investing in this area, which is not easy since the returns on investment are rather long term and not immediately visible. If the regional academies and universities join forces and set out together to convince their governments of this high priority, they may be more successful than if they work individually.

References

- Drenth, P.J.D. (2004). Regional scientific collaboration in Europe: Opportunities and challenges. In M. Durovic (Ed.), *The interacademy Council for South East Europe* (pp. 17-30). Podgorica: Montenegrin Academy of Sciences and Arts.
- European Union Research Advisory Board (2004). *The structural funds and the research component*. EURAB 04.037-final.

Responsible Conduct in Science

Pieter J.D. Drenth^{*}

Introduction

For a long time academia had run the risk of being accused of superbia by developing an ivory tower attitude that repudiated accountability for the human and social effects of research. "Science is about how things are, not about how they should be", was an often heard defence of this position. For the past few decades, however, the issue of science and values, and their interdependence has become a major subject of discussion, certainly within medical sciences.

Attacks on the autonomy and sovereignty of science have come from different sources. First of all there was the anti-establishment movement of the 70s in which the political-scientific reflections of authors like Marcuse, Adorno, Habermas and Holzkamp became quite popular and were willingly embraced by student activists and critical staff. Their protests undoubtedly contributed to the dismantling of the misconception that freedom of science was equivalent to the negation of societal responsibility.

A second assault on free and autonomous academic science came at the end of the 80s with both governmental and industrial circles' appeal for the 'utilisation' of scientific research. Scientific goals were therefore regarded as subordinate to those of economic and technological development. Utility, applicability and economic relevance became more important criteria for research than pure scientific merit.

In recent years, the question of science's autonomous and value-free character versus the relevant and value-bound one has received ample attention, also in the world of science itself. We will briefly comment on this discussion.

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Science: value-free or value-bound?

Granted, the issue of the relationship between values and science has become an important one during the last few decades, but opinions still diverge. On the one hand, the point of view that pure scientific knowledge is value-free, and thus has no moral connotation, is defended: Science tells us how the world is, whether we like what we hear or not, the argument goes. Basic research is driven by scientific curiosity and not by the hope that it will be put to practical use. Ethical and moral issues can only arise when science is applied and is expected to produce usable practices or objects. But then it has become technology and is no longer science. Technological objects or processes can be used for better or for worse. Science, however, produces insights, ideas, pieces of knowledge, which are in themselves neutral and can only be corrupted if mixed with political, social, economic or other non-scientific aims (see for instance, Wolpert, 1999).

On the other hand, there is a different view that does not accept the premise that science should only be concerned with producing reliable knowledge and should, consequently, be value-free. The value-bound character of science is defended with the following arguments (Drenth, 1999a):

- It is a basic obligation of all scientists and scholars to reflect on the paradigmatic presumptions and the socio-historical entrenchment of their scientific activities. This reflection is, in itself, a meta-scientific and value-embedded phenomenon. Our conceptualisations and models are always abstractions of reality, only an approximation - or 'reconstruction' - of reality can be achieved.
- The distinction between basic and applied science is less clear-cut, as is often suggested. There is a good deal of overlap between the two spheres, and it is increasingly difficult to identify parts of science that do not affect technology, or are not themselves affected by technology. Therefore, reserving the qualifications 'value free autonomy' for science and 'value-bound heteronomy' for applied science and technology is no longer tenable.
- Scientists deal with a social, political or psychological reality that is continuously affected and changed by scientific findings. Health, safety, communication, privacy, mobility, welfare and economic development, and many other of humankind's worthy goals are radically influenced by the advances of modern science. But many ethical or

socio-political problems result directly from these advances. Scientists should be aware of this and should anticipate the changes such scientific advances bring about, and the problems they generate.

- Even if scientists refrain from actually making political or ethical choices, and restrict themselves to presenting probabilities and risks coupled with certain options, their reasoning is not value-free. Risks involve values and normative choices that the scientist has to face. Questions such as the following arise: Risks for whom? How far does the 'right to know' go? What is the balance between the individual's right to self-determination and the interests of larger groups, or society as a whole? At what level of certainty does the scientist have to issue a warning, especially as far as irreversible developments are concerned?

- Scientists cannot avoid the meta-scientific question of whether what they pursue it is worth knowing. They have to justify - not only to themselves, but also publicly if the taxpayer or a sponsor's money is involved - why scientific issues need to be addressed. In essence, this justification implies non-scientific choices and decisions.

It is, of course, crucial for science to maintain its objectivity in the face of pressure from religious convictions, ideological movements, industrial lobbies, governmental or political and social pressure groups. On the other hand, it has become ever more difficult to separate the functions of knowledge production and making value-bound choices in extending research findings to the public or society at large. Research is, thus, embedded in the context of values, interests and political objectives. Rather than denying this, or retreating to the safety of the ivory tower, the scientists does well to realise it and to take the appropriate responsibility seriously. Many science organisations and academies have therefore sensibly placed ethical issues in science on their agendas. In the next section, we will further look into the nature of this connection between science and ethics.

External social/ethical problems in science

In an earlier publication, I made the distinction between external and internal social/ethical problems (Drenth, 2002). The former category refers to questions of the social/ethical context as well as the consequences of scientific research. Questions such as the following arise:

- What is the justification for the choice of a research topic? Is what we intend to investigate, worth knowing? This question is a matter of the researcher's personal preference and values, but, as said, in many cases also of importance to the taxpayers or sponsors.

- Is the scientific research truly independent of sponsors, employers, clients or other interested parties? We know that scientific research should be independent and free from any external pressure or influence. But all too often - and this is especially true for sponsored or contract research - there is an overriding temptation to avoid biting the hand that feeds.

- To what extent is the researcher responsible for what is done with the results? Research results can be used for better or for worse. They can turn into a blessing for individuals or society, but there are also many cases in which researchers sadly observe their research being abused by colleagues, practitioners, or the media.

- Are there cases in which ethical objections to certain implications of research, or certain consequences of new insights are becoming too strong? Sometimes scientific and technological developments' progression is faster than the reflection required on their societal and moral implications. In the medical field cloning, genetic cancer research, embryonic stem cell research, xenotransplantation and others are cases in point.

The last two points raise the interesting question of whether and where 'no go' or 'slow go' decisions could be called for because of these lagging ethical reflections. 'No go' implies that the research in question is wholly unacceptable. 'Slow go' would apply in cases where scientific or technological developments are out of step with the ethical reflection on their impact and consequences. The research could be temporarily suspended until the ethical implications have been subjected to public discussion, and reasonable consensus is reached (see McLaren, 1999).

In discussing the constraints to be imposed on science, I would like to assert that in general it would be inappropriate to refrain from doing research for fear that it might be abused or be irresponsibly applied. This would almost certainly mean the end of all research, because nearly all scientific results are, in principle, open to wilful abuse. An additional problem related to constraining research on the grounds of potentially undesirable or dangerous consequences, is that such consequences are not always easy to foresee, especially in fundamental and innovative research. After all, one of the characteristic features of

such research is that its results cannot be predicted or charted beforehand. Surprise is typical of creativity and serendipity.

It is further important to realise that any discussion of the constraints to be imposed on research is fraught with danger. History abounds with examples (Galileo, More, Spinoza, Lysenko) of science having been repressed because its research results did not find favour with the ruling ideologists, or did not serve the economic or political authorities' interests, or were opposed to the interests of (sometimes wholly respectable) movements and action groups, such as feminism, the anti-discrimination movement, environmental activists, and the freedom movement. The medical and behavioural sciences too have their victims. A few years ago, the *New England Journal of Medicine* described how the pharmaceutical industry lobby applied undue pressure on researchers who intended to publish data that it found unwelcome (Deyo et al, 1997). Recently, we read about the complaints of the American Union of Concerned Scientists (UCS) regarding the manipulation of the process through which science enters political decisions (*The Economist*, 10 April 2004). Although President Bush's science advisor John Marburger has tried to rebut these claims (*Nature*, 428, 8 April 2004; *Science*, 305, 30 July 2004), many of them still prevail. One of the notorious cases is that of the eminent University of California cell biologist Elizabeth Blackburn's dismissal from her position on the President's Council on Bioethics, because, she claims, of her outspoken support for research on human embryonic stem cells. I am sure all countries have similar cases.

Returning to the 'no go' decisions: are there ethical constraints to scientific research that affect such irrefutable values that all scientists and scholars would regard them incontestable? Which ethical constraints would have such a universally imperative character? In an earlier publication, I suggested that we might agree on the following principles (see also Drenth, 1999):

(1) Research is not justifiable if before, during, or after an experiment or the gathering of research data, unacceptable damage is inflicted upon the object of research, or on the environment and society (unrest, waste, pollution). This applies to all research objects, whether they be people, animals, nature or culture.

(2) A second line should be drawn when the nature and consequences of the research are in conflict with basic human values. These values always include:

- Respect for human dignity, which guarantees all individuals' autonomy and freedom of choice, informed consent prior to participation in research, and the rejection of every intent to commercialise the human body;
- Solidarity with mankind, thus guaranteeing solidarity with fellow human beings on the basis of equality; and
- Solidarity with future generations, which embodies a broader responsibility for the sustained development of the planet to be left to future generations.

Internal ethical problems

Internal ethical problems all refer to scientists' improper behaviour. This category encompasses:

- improper or imprudent behaviour with respect to subjects of experimentation, such as the insufficient protection of privacy or anonymity, neglecting to obtain informed consent, discrimination, improper treatment of experimental animals etc.
- improper dealing with the general public and the media, including too positive and too optimistic reporting of research results, which would create too much unjustified hope, especially in medical research,
- disregarding rules of 'good practice', such as undeserved authorship, improper citation, no sequence of authors according to contribution, or alphabetical order if contributions are equal, violating the rule to avoid conflict of interests (in a review task for publication or subsidy) etc.
- manipulation of data or interpretation, including fraud (fabrication or falsification of data), deceit (deliberate violation of methodological requirements (sampling, statistical techniques) so as to create a false confirmation of hypotheses, or otherwise biased results), and
- infringement of intellectual property rights, such as plagiarism, or pinching of a colleague's discovery, or a student's idea.

Of course, not all violations are equally serious. The manipulation of data is the most severe of these violations, but there is also variance within the categories. Fabrication of data is more serious than 'rounding off', or making use of a too small sample, while plagiarising substantial pieces of text is more reprehensible than pinching an idea from a conversation between colleagues.

Hard data on the occurrence of misconduct are rare and also difficult to obtain. Part of the problem is that it is not always easy to draw a clear line between unacceptable and (still somewhat) acceptable behaviour. Where lies the boundary between experimental 'proof' based on a too small sample and the illustration of an argument with 'case' data? Or between plagiarism and careless citation? Was an incorrect, but 'favourable', statistical technique truly chosen deliberately? Is it selective use of evidence, or a different methodology, or even another paradigm?

The number of reported cases in scientific and public media is, however, growing, also in medical research. To mention only a few well known cases reported in the media:

- A few years ago *Nature* and *Science* comprehensively covered the infamous case of a group of cancer researchers' fraud at the Max Delbrück Centre for Molecular Medicine in Berlin;
- At the same time (13 September 2001), *Nature* revealed a number of shocking cases of journal reviewers' theft of ideas;
- The *Times Higher* (27 April 2001) divulged that at least 19 review articles published in the highly esteemed *New England Journal of Medicine* had been written by researchers who had secret financial links to the pharmaceutical companies that had brought the examined medicines on the market;
- At a recent conference of the Office of Research Integrity (ORI), a unit within the American government's Department of Health and Human Services, a number of case studies were presented, including the dramatic case of the Research Triangle Institute in North Carolina where there had been a veritable 'epidemic of falsification'; employees had simply fabricated whole batches of data;
- Recently, Nobel Prize winner Rolf Zinkernagel's Institute of Experimental Immunology at the University of Zürich was accused of manipulating data (*Nature* 20 February 2003);
- The *New England Journal of Medicine* had to withdraw a submitted article because a number of the co-authors were unaware that "their" article had been submitted,
- Earlier this same journal had described how the pharmaceutical industry lobby placed undue pressure on researchers who were intending to publish data that it found unwelcome (Deyo et al., 1997).

The above is a selection from the generally known cases of scientific misconduct, but the fear that far more fiddling with research data

occurs unnoticed, does not, unfortunately, seem unfounded. Three years ago, an issue of *Nature* (vol.418, 8 August 2002) discussed a report that the American Institute of Medicine (IOM) had just released and that specifically dealt with scientific integrity and scientific misconduct. The IOM also noted that fully-fledged cases of scientific misconduct are rare, but that smaller lapses often go unnoticed: fudging a control here, deleting a messy data point there. But the IOM warned that what might appear to be minor violations of integrity, will have bad long-term consequences. It called for research institutions to take a more active role in creating an environment in which misconduct will not occur.

Causes of misconduct include pressure from powerful institutions or persons (governmental or church leaders), economic and financial motives (lending an ear to industrial sponsors, the risks associated with contract research), and the scientists or scholars' ambitions and vanity. Given the pressure on researchers to produce publishable output and to show (preferably spectacular) results, a present-day growth of misconduct is certainly more than likely.

As far as the prevention of misconduct is concerned, one may consider corrective measures (punitive measures, sanctions), or preventive measures (procedures, regulations, precepts, whistleblowers, ombudspersons), but most important is the development and fostering of a scientific conscience, and a proper sense of values and standards.

What role do Academies play

What role could academies of sciences and humanities and umbrella academy organisations, such as the All European Academies, play in this matter? After all, academies have an important advisory role. Moreover, the ethical issues in general, and most certainly the problems concerning scientific misconduct, are of real concern to the academies.

At ALLEA's General Assembly in Prague in 2000, I reported on a modest survey of ALLEA members that addressed these problems. Four questions were asked: Is scientific misconduct a serious and growing problem in your country? Is there a formal procedure or protocol to deal with these problems in your country (the role of the Academy)? Is there a need for a prescriptive code of ethical conduct,

or good manners in science? What role could ALLEA play in these matters?

The reactions varied, but in general scientific misconduct was seen as a growing concern. Often there was no official procedure or protocol, and the leadership of the relevant institute handled the matter. Sometimes academies were involved in an advisory or evaluative capacity. The general reaction to the question on the need for a code of conduct was affirmative; in certain cases such a code was already available. Almost all ALLEA members (with the exception of one or two who only acknowledge the problem as a country-specific matter and not a universal one) welcomed the idea of ALLEA taking some initiative or role in the further development or promotion of a 'code for good manners in science' in Europe.

Many academies have already developed such a prescriptive set of rules, a code of conduct and/or a procedure for handling reported cases of misconduct. The NAS publication *On being a scientist* (1995, sec. ed.) is both well known and well written. In 1998, the *Deutsche Forschungs-Gemeinschaft* issued Proposals for safeguarding good scientific practice as a reaction to a disturbing case of collective fraud. In December 2000, the European Science Foundation issued a policy briefing on this issue under the title *Good scientific practice in research and scholarship* in which, among others, it was recommended that:

- National academies should draw up national codes of good scientific practice in research and scholarship where these do not yet exist; and
- National academies should initiate discussions on the most appropriate national approach to procedures for investigating allegations of scientific misconduct, whether by means of an independent national body, formal procedures at each university and research institution, or by other means.

It should be clear that this does not only concern purely national problems, although culture and traditions, as well as legislation may have an influence on the way these problems are handled in practice. The issues in question are, however, generic and universal, and also need an international approach. This is why I have urged (intermediate) international Associations of Academies, such as ALLEA, USNAS, the Federation of Asian Scientific Academies of Science, the African Academy of Science and others to become actively involved in the co-ordination of the various approaches undertaken nationally in co-

operation with world-wide organisations such as IAP, ICSU, TWAS and UNESCO. In fact, they can play a role by specifically:

- placing the issue of misconduct on the agenda,
- providing individual national academies with information and advice,
- co-ordinating national activities internationally with a view to alignment around common principles (although not disregarding differences of opinions and legal traditions between states), and
- dealing with misconduct in international research projects.

In this vein, ALLEA has tried to take up responsibility for the co-ordination at a European level, without this implying that uniform rules and procedures need to be developed for all European countries. ALLEA adapted a recommendation by the Royal Netherlands Academy of Arts and Sciences (*Notitie wetenschappelijke integriteit*, KNAW, 2001), translated it into English and has offered this 'Memorandum on Scientific Integrity' for the perusal of all ALLEA's member academies (ALLEA et al., 2003). This Memorandum urges the founding of a National Committee for Scientific Integrity (NCSI) that can serve as an advisory board, or a science court of appeal when the (primarily responsible) institute or university's settlement in respect of the violation of scientific integrity is found to be unacceptable to one of the relevant parties. In The Netherlands, such a body (LOWI) has been founded by the Royal Academy in close consultation with the National Science Foundation (NWO) and the Association of Universities (VSNU). It is not ALLEA's intention to have other European countries copy this formula exactly, but by offering this model, it aims to stimulate the discussion on the most desirable approach and to point out the potential helpful role that Academies of Science could play. Furthermore, it aims, if possible, to co-ordinate a European approach to the phenomenon of scientific misconduct that can be so detrimental to science.

References

- ALLEA, KNAW, NWO, VSNU, (2003). *Memorandum on scientific integrity*. Amsterdam: ALLEA/KNAW.
- Deyo, R.A., Psaty, B.M., Simon, G., Wagner, E.H. & Omenn, G.S. (1997). The messenger under attack - intimidation of researchers

- by special-interest groups. *New England Journal of Medicine*, 336, 1176-1179.
- Drenth, P.J.D., (1999). Science where do we draw the line? *European Review*, 7, 239-246.
- Drenth, P.J.D. (1999a). The ethical discussion: Main themes and issues. In P.J.D. Drenth, J.E. Fenstad & J.D. Schiereck (Eds.), *European science and scientists between freedom and responsibility* (pp. 173-186). Luxembourg: Office for Official Publications of the European Communities.
- Drenth, P.J.D. (2002). International science and fair-play practices. *Science and Engineering Ethics*, 8, 5-11.
- European Science Foundation (2002). *Good scientific practice in research and scholarship. ESF Policy Briefing*.
- Koninklijke Nederlandse Akademie van Wetenschappen, Verenigde Samenwerkende Nederlandse Universiteiten, Nederlandse Organisatie van Wetenschappelijk Onderzoek (2001). *Notitie Wetenschappelijke Integriteit: over normen van wetenschappelijk onderzoek en een Landelijk Orgaan voor Wetenschappelijke Integriteit*. Amsterdam: KNAW.
- McLaren, A. (1999). The ethical dilemma: The living world. In P.J.D. Drenth, J.E. Fenstad & J.D. Schiereck (Eds.), *European science and scientists between freedom and responsibility* (pp. 101-107). Luxembourg: Office for Official Publications of the European Communities.
- National Academy of Sciences, National Academy of Engineering, Institute of Medicine (1995). *On being a scientist; Responsible conduct in research*. Washington D.C.: Nat. Ac. Press.
- Wolpert, L. (1999). Is science dangerous?. In P.J.D. Drenth, J.E. Fenstad & J.D. Schiereck (Eds.), *European science and scientists between freedom and responsibility* (pp. 25-31). Luxembourg: Office for Official Publications of the European Communities.

Europe as a Knowledge Society

Pieter J.D.Drenth *

Europe of Knowledge

There is a general agreement among experts that the knowledge base of Europe is its richest resource. Consequently, Europe's economic and social future depends on the careful development and exploitation of this base. Stimulation of the latter is an important means to become a winner in a world-wide knowledge-based economy.

In this light it is encouraging to see that at the beginning of this century the European Commission and the European heads of state, at their meetings in Lisbon and Barcelona, have formulated the objective of increasing European R&D expenditure from its current 1.8 to 1.9 % of EU GDP to 3% of GDP by the year 2010. During the last 4 years the European Commissioner for Research Busquin has stimulated European scientific collaboration and performance by defining the conditions and objectives of the European Research Area and by developing the so-called Framework Programmes into its most significant incentive system. On the 6th of April 2005 the European Commission made public the plans for a new EU research programme for research, technological development and demonstration activities in its Proposal for the 7th Framework Programme, under the title 'Building the Europe of Knowledge'. The plans and propositions have been neatly arranged around four themes: co-operation, people, ideas, and capacity. All European Academies (ALLEA), the European Federation of national Academies of Sciences and Humanities, has taken the liberty of writing an extensive response to this proposal with the title 'Investing in Knowledge in Europe', some elements of which will be incorporated in the present paper.

Nowadays, there is ample evidence that there are constraints on achieving the, admittedly ambitious, Lisbon goal of becoming a world leader in research and development. This is, among others, due to the

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absence of systematic European-wide competition and the absence of basic research funding across the European Member States. Although in terms of quality of higher education and quantity of output Europe is still on a par with the US and certainly with Japan, there are indicators of a relative decline. The number of frequently quoted publications, the number of Nobel prizes and other prestigious awards, the ranking of universities, the net outflow of human resources in science and engineering draw anything but a rosy picture on the state of affairs in science (and in particular in medical and life sciences) in Europe as compared to the USA and, in some respects even to some of the Asian countries. This is the more true if we consider the changes over the last decades. We often hear the statement that the available knowledge in Europe is sufficient and that we only need better translation into technological applications. The second part of this view is correct, but the first part not any more. We need more and better research as well as a more adequate utilisation of this knowledge.

It is therefore laudable that the European Commission has asked for a substantial increase (in fact a doubling) of the research budget in the coming Framework period, a request that is supported not only by the entire European scientific community (as is to be expected), but also by the European Parliament and the European Parliament's Committee on Industry, Research and Energy. Such an increase is seen as an important and necessary condition for the strengthening of European research capacities and for bridging the gap between RTD and innovation, which will help to achieve the EU's aspired global leadership in science and technology

Collaboration

Of course the bulk of R&D in Europe is and remains to be sponsored by national funding. The current Framework R&D spending accounts for less than 5% of all EU public R&D expenditure. It would clearly be unwise and contradictory if the increase in EU funding for research were to be counterbalanced by a reduction in national support for research in the Member States. Of course, the principle of subsidiarity prevails also in the support for R&D. The European budget has to be spent on activities at the European level, that have European added

value. This added value has to be found in collaboration, coordination and true European competition. A few words on collaboration first.

There are several reasons why we *should* collaborate more than before. Originally the argument of the European Commission in supporting the collaboration in research was rather pragmatic/economic. It was argued that Europe needs to strengthen its *competitive position* worldwide and especially relative to the United States and Japan. As indicated above, the quality of European education and research can indeed compete with the United States. However, we have also seen that due to fragmentation and duplication, and due to a lack of real European-wide competition for top level research funding Europe's relative com-parable position is being challenged at present. Moreover, Europe falls really short if one looks at how effectively all that knowledge and insight are translated into industrial applications, patents and other forms of technological utilization, when compared with the United States and Japan. The translation of scientific research, so crucial for economic innovation, is truly lacking in Europe. The difference in output in terms of industrial development is uncomfortably large and still growing; and increased cooperation and harmonization are needed.

In the meantime the European Commission has taken a broader view, and defends collaboration on a variety of valid grounds. Indeed, quite a few different arguments for the need for collaboration can be brought to the fore.

The first argument is that many of our highest priority issues have a truly international character. One cannot study environment, infectious diseases, transportation, trade, migration or economic recession from a purely national perspective. We have to collaborate to get a full picture of many pan-European policy issues, be it climate change, the effects of migration and the presence of minorities on the national social system as well as the European civic society, the effects of viruses and infectious diseases because of the greater mobility of the citizens, energy and the possible use of nuclear power, the need for vaccination against live stock diseases, genetically modified food or other topics that have an international character but are at the same time controversial and difficult to meet with agreement.

Secondly, only at a higher (*e.g.* EU-) level of aggregation can research create the required critical mass that individual countries often fail to achieve. In the smaller countries it is not always easy to find the

top-level researchers in sufficient quantities. If one can cross the national border the chance of composing successful groups is of course much higher.

Thirdly, collaboration helps to create and to enhance research skills and knowledge in a wider Europe by bringing junior researchers from different regions in contact with cutting edge research, and thus improve the European research capacity. This, for instance, has been the secret behind the success of the EC's Madame Curie programme.

Fourthly, national funding alone often falls short of what is needed for many of the mega-programmes and only combined efforts can provide the necessary infrastructure and means. The co-ordinated analysis of Europe's needs in terms of infrastructural facilities as well as the Road Map developed by the European Strategy Forum on Research Infrastructure (ESFRI) should be seen as a welcome step towards co-ordinated development of an infrastructure of European interest. Here we have another reason to support an increase in EU funding: it will also stimulate the further (badly needed) private investment in research in Europe.

Fifthly, international collaboration stimulates improved integration of the currently often fragmented and duplicating research in the various European nations, and to the co-ordination of national strategies. Moreover, it leads to a much wider dissemination of results than is realised with respect to national research.

And last but not least, there is a *moral obligation* for Western, economically more advanced countries to strengthen the R&D capabilities of economically less-advantaged countries, including a number of (central and eastern) European countries. This obligation certainly applies to the economically really deprived countries such as is often found in the third world. In the long run, such collaboration is the best precondition for peaceful coexistence and an economic balance of the world, and thus beneficial for all.

The message is clear: scientists and scholars in Europe must cooperate, and the institutions that have responsibility for the promotion of research, such as the national academies (and *a fortiori* Associations of National Academies, such as ALLEA), have to encourage, and where possible, facilitate such collaboration.

Basic or applied?

There is another persistent misunderstanding, that there is enough basic research in Europe, and that we only need more applied research. In fact, the European Commission's Framework Programmes so far have always favoured more targeted research at the cost of more fundamental, investigator driven research. It is only in this 7th FP that room is created for specific cutting edge, science driven research. Let us have a closer look at this distinction in the light of our discussion.

First of all it has to be said that the distinction between basic and applied research is less clear-cut than is often suggested. There is a great deal of overlap between the two spheres, and many emerging fields of science and technology (for instance information and cognitive sciences, nano- and biotechnology) embrace significant elements of both. It is increasingly difficult to identify parts of sciences that do not affect technology, or that are not themselves affected by technology. In this light we have sympathy for the proposal of the European Commission's High-Level Expert Group on 'Maximising the wider benefits of competitive research funding at European level' in its recent report 'Frontier Research: The European Challenge' (EC Office SDME 01/38) to use the term 'frontier research' to reflect research that stands at the forefront of creating new knowledge and developing new understanding. This can refer to both basic and more problem oriented research.

Methodologically, too, there is nothing wrong with what generally has been seen as applied research: it follows the same rules and standards as basic research, and has quite frequently resulted in important theoretical scientific breakthroughs. But there is a difference in orientation. Science always starts with curiosity, the wish to know the causes of and reasons for observables and the desire to find scientific explanations for what is not yet understood. In fundamental research, these unanswered questions present themselves in experimentation, reflection and scientific discussions; they are science generated and conclusion oriented. In applied research these questions are offered by practical problems in industry, society or government. Its origin as well as its goal is therefore different, it is problem induced and solution oriented.

Now, it is self evident that the fruits of free, science driven research are the augmentation and enrichment of our body of knowledge. In fact,

in these fruits we deal with an independent and indisputable value of science, its *intrinsic* relevance. Fundamental research, be it in sciences or in the humanities, augments the general body of knowledge, which is an intrinsically valuable and precious quality of civilisation, and an essential condition for the creation of the next generation of scientists. Through its scientific enlightenment of the general public, it can even be regarded as an important instrument with which to develop and strengthen a society's intellectual defensibility and democratic foundation.

But I would like to submit that science-driven research is essential also for the stimulation of economic growth and social welfare. It is indeed a misconception that fundamental, science-driven research only serves the academic goal of augmentation of knowledge, and that it is not auxiliary to, let alone pre-conditional for important technological and industrial innovations. Many striking examples can be given to prove this point, although it often did, admittedly, take some time before certain discoveries reached the practical application stage: Maxwell's groundwork on the transmission of electronic waves resulting in Marconi's telegraph some decades later, the development of the fundamental Radon theory that lead to computer topography (60 years later!), modest 1920's polymer chemistry eventually being applied in the plastic manufacturing, fundamental physiological research that lead to significant innovative pharmaceutical remedies, the invention of the transistor finding its use in the semiconductor area, and – to give a striking recent example - the development of a device with which to exchange large data files by a few physicists working at CERN, thus sowing the seeds of the World Wide Web, which is mainly responsible for the information and communication branch's enormous prosperity they are all significant cases in point. As mentioned, Europe's economic and social future depends on the careful development and exploitation of its knowledge base. Innovation in a knowledge economy requires new knowledge, and new knowledge is specifically generated by cutting edge, science-driven research. Stimulation of the latter is an important means of becoming a winner in a worldwide knowledge-based economy.

Of course, fundamental research is fairly unpredictable and risky if judged by its technological utilisation. Not all fundamental research leads to suitable applications, and technological innovations are often unintended by-products of research (serendipity). But, as is always the

case when dealing with the probabilities of very valuable outcomes: one has to take some false positives for granted in order to continue having a chance of capturing a big prize.

It goes without saying that applied and instrumental research, leading to direct industrial and technological applications as well as strategic research - i.e. fundamental research that supports the building of a strong European capacity in areas relevant to Europe's strategic needs - is also indispensable for the realisation of the ambitious Lisbon targets. In other words, we need substantial support for targeted research, and therefore welcome the fact that there is a fair degree of continuation of the 6th FP as far as the themes of co-operative research are concerned, but we particularly welcome the importance assigned to frontier research, and the proposal to create a fund for science-driven research, as well as an agency to manage this fund, i.e. the European Research Council.

The European Research Council

Scientists and scholars are not noted for their readiness to agree. So much the more striking is the heartfelt agreement of the European scientists and scholars on the value and the necessity of the promotion of frontier research at the European level, and of the creation of a European Research Council, an independent body run by scientists, intending to fund research projects of individual teams on the sole criterion of scientific excellence. Within the community of scientists and science organisations in Europe hardly a dissenting view can be discerned on the importance of the creation of a European science-driven research fund, and a science-controlled agency to manage this fund. The principle of allowing a researcher in any European state to compete with all others on the basis of excellence presents a new definition of European added value and is a significant improvement on the one used hitherto, which merely entailed the collaboration of research teams from different European countries. This view is officially endorsed by almost every European science organisation: the European Federation of national Academies of Sciences and Humanities (ALLEA), the European Science Foundation (ESF), the association of Heads of National Research Councils (EUROHORCs), the European Research Advisory Board (EURAB), the European

Academies Science Advisory Council (EASAC), the European University Association (EUA), a great many European disciplinary societies, among others united in the Initiative for Science in Europe (ISE), and individual member organisations like Academia Europaea, EuroScience, the Salzburg Academy of Arts and Sciences, and others.

Not only is there quite an agreement on the principle of an ERC, there is also great consensus that, to ensure its acceptance, integrity and effectiveness the ERC needs to be modelled on the principles of self-governance, reflecting the established and well-proven model of the National Research Councils in many countries. Recently various European science organizations have expressed their concern about a possible different positioning of the Scientific Council. The ERC needs to operate as an independent body, and its governing Council of Scientists should not be an advisory body, but needs to be integral to the ERC in terms of policy setting, and decision making.

In our view the ERC has to dispose of a budget that is commensurate with the socio-economic expectations; it should be of the order of the budget of the larger national research councils (*i.e.* between 1.5 and 2 B. € per annum). For comparison, the annual budgets in the USA of the National Science Foundation (5 B.\$) and the National Institute of Health (28 B.\$) indicate what it takes to make a continent-wide impact.

It is the strong opinion of the scientific community in Europe (including the representatives of the newly acceded countries) that the ERC's objective of furthering European top quality research should not be diluted by other, however laudable, goals, such as researcher mobility and the development of the scientifically weaker regions in Europe. In line with this we agree with Commissioner Potocnik's position that frontier research funds should not be used for solidarity purposes. At the same time a-specific measures should be taken (in particular the use of the solidarity instruments for RTD purposes) to ensure that these countries would be able to gain from Western European countries, and in due course draw level with the rest of Europe.

Science in Society

A final observation with respect to another aspect of science and technology that has become quite conspicuous in recent discussions.

The latest results of the Eurobarometer (2005), a European survey of attitudes and opinions, showed a disturbing finding: many Europeans consider themselves poorly informed on issues concerning science and technology, resulting, as is suggested, in a more sceptical perception of science and technology. This is particularly found among women, older people and those with a lower level of education. With respect to ethical concerns, we see the classical paradox: on the one hand people express fear of scientists, whose high degree of knowledge may make them too powerful, and also harbour concern that scientific research could cross ethical boundaries, while, on the other hand, they want scientists to work freely without the fear of risks and potential dangers slowing them down, since they believe that scientific progress will be beneficial for their present and future life.

Not all criticism against science is objectionable. Some of the captious questions posed to present day scientists are amendable to reason and it is not beyond dispute whether *Homo Sciens*, who has appropriated much of the divine power of the time, is capable of handling that power in a responsible manner.

It is here that insufficient and unfair communication about research and its results come home to roost (see also Drenth, 2005). Some researchers focus too emphatically on the policy and practical implementations of their research, also when this is not warranted. Other scientists give their opinion on political and social issues, wrongfully suggesting that their words are scientifically justified, while there may be no empirical evidence available, or not at their disposal (for instance, because it is not their field of expertise). Others again claim too much success and promise results too quickly in order to acquire financial support for their research, to obtain public honour, or to secure an appointment or promotion. Sometimes the public is simply misled for political reasons: the general and unjustified resistance against genetically modified food, or against nuclear fission are cases in point. Scientists should never let themselves be misused for political purposes. There is a case to be made that wrong communication about research is always harmful. It creates too much hope (particularly in connection with medical research), and, sometimes, unjust fear (technological and information developments). And, if the research results fall short and fail to fulfil the claims, they boomerang on science in general.

The FP7 proposal envisages ‘Science in Society’ actions taking place along three lines: (1) the embedding of the theme throughout the 7th Framework Programme (through the introduction of social/ethical themes and communication strategies in the content and operation of the FP’s various components), (2) defining of and focussing on a number of core themes at the interface of science and ethics, and (3) the co-ordination of national programmes and policies tailored to social/ethical issues in science and technology.

ALLEA considers this a fruitful and effective approach. It particularly wants to emphasise the importance of embedding a social/ethical view in regular projects and programmes. The objectives of ensuring public confidence in European research and its applications, of strengthening the scientific workforce and providing better career opportunities in science, as well as the development of trust in and appreciation of science can best be achieved through the integration of ‘science in society’ throughout the 7th Framework Programme, and not (only) by focussing on underpinning research with a dedicated budget, although the latter can, of course, be ill spared.

It is clear that the FP7 intentions to further public awareness through the dissemination of scientific information, an honest dialogue with the general public, the promoting of a scientific and educational culture in Europe, and placing responsible science at the centre of policy making, are actions that have a high Community added value and that could be important stimuli for the greater acceptance of science by society.

References

- ALLEA (2005). *Investing in knowledge in Europe*. Amsterdam: KNAW/ALLEA.
- Eurobarometer Reports (2005). http://europa.eu.int/comm/public_opinion/index_en.htm
- Drenth, P.J.D. (2005). *Science communication, a vital necessity*. STEPS: the 7th Olympiad of the Mind, Paris, May 21-22, 2005 (in press).

Section II
Representations and Communication

Investing in Knowledge in Europe
*Reflections of ALLEA on the Proposals for the
Seventh Framework Programme 2007 - 2013 of the
European Commission*

Preface

This brochure contains a response of All European Academies (ALLEA) to the European Commission's recent proposals for the Seventh Framework Programme. All European Academies is the European Federation of 52 National Academies of Sciences and Humanities, representing 39 countries in the wider Europe.

An earlier draft of this response has been discussed at ALLEA's Steering Committee meeting in Tallinn, Estonia on April 15, 2005. The amended draft has been sent to ALLEA's member Academies for reactions and comments. The reactions were, without exception, assenting. Yet quite some comments and further suggestions have been submitted, which have been incorporated in the final version as much as possible. We may claim that the present exposé fairly reflects the views of ALLEA's membership.

We hope that ALLEA's views on the Seventh Framework proposals, as articulated in this reflection, will find their way into a broader discussion on the EC's Framework proposals, and may contribute to the requisite discussion on the future development of science and scholarship in Europe.

Amsterdam, 15 June 2005

Pieter J.D. Drenth
President ALLEA

Executive Summary

The knowledge and the skills bases of Europe are probably its richest resource, but they need to be carefully developed and exploited if they are to provide an important and necessary stimulus to Europe's growth and development. Much of the funding for the development and exploitation will continue to be found locally, but there is a need to coordinate and develop Europe-wide competences if the knowledge base is to achieve its potential. In general, we believe that the proposals for FP7, as set out in the recent draft communication, are a major step forward in this programme's catalytic role. In particular, ALLEA strongly supports the proposal to double EU research funding and the longer-term nature of the programme. ALLEA also welcomes the proposals relating to the European Research Council, the continuation of a number of successful elements from the previous Framework Programmes, as well as the plans to bring a number of changes and improvements into force as suggested by both participants and experts.

In agreement with almost all individual and institutional representatives of the scientific world in Europe, ALLEA strongly supports the proposal to stimulate excellent frontier research by creating a European Research Council tasked with supporting investigator-driven fundamental research of the highest quality in a strongly competitive mode, with applications evaluated by international peer review. ALLEA agrees with the view that an exclusive emphasis on scientific quality is a *sine qua non* for the promotion of top-level research in Europe, and that these frontier research funds should not be used for solidarity purposes. It is ALLEA's opinion that to achieve the latter, solidarity funds (structural fund, cohesion fund) should be used by reserving a certain percentage for RTD purposes.

The stimulation of (young) scientists and scholars' mobility, as provided for by the Curie scholarships, has been a great success. The continuation and further strengthening of this individual support are encouraged. ALLEA is pleased to see that a number of useful suggestions are made to make Europe more attractive for non-European researchers. It reiterates further ideas in this respect, as suggested in an earlier communication to the Commission.

ALLEA is happy with the vision of relying on a coordinated analysis of Europe's need for large infrastructural facilities and a Road Map for further developments, as unfolded by ESFRI. However, ALLEA would

also like to draw attention to the smaller investments (distributed communication structures, electronic libraries and archives, databases, survey-systems) that are, nevertheless, often still beyond a single country's reach.

Further work clearly needs to be done regarding the level of funding that should be provided for successful grant holders from the ERC. Furthermore, the sustainability of the academic research base needs to be reconsidered for activities elsewhere within the Framework Programme. ALLEA would find it regrettable if excellent research groups in Europe were prohibited from participating in the programme due to a lack of matching funds, or if the arrangements jeopardised the participating universities' finances.

The FP participants complained widely about the demanding and long procedures required by the previous Framework Programmes for the submission of project proposals as well as the rigid regime and cumbersome administrative control once they had been accepted. ALLEA believes that the recommendations to simplify these procedures are essential, but believes that there is merit in introducing a general two-stage process of submission and evaluation, so that the energy and effort required for the application are more reasonably balanced with the rate of success. ALLEA also welcomes the intention to introduce general mid-term reviews.

As far as the proposals for cooperative activities are concerned, ALLEA by and large agrees with the proposal to continue many of the themes that were carefully selected in the previous FP. However, ALLEA believes that the arrangements for FP7 should more overtly encourage an inter- or multidisciplinary approach. Secondly, ALLEA finds the proposed elaboration of the Socio-economic Sciences and Humanities rather restricted and meagre. It therefore believes that there are advantages to splitting this 'Cooperation' theme into two separate sections: 'Behavioural and Socio-economic Sciences' and 'Humanities in Europe: Understanding Culture and Civilization'.

The continuation of the new FP6 instruments Integrated projects and Networks of excellence is supported, but more clarity is needed regarding their nature and criteria as well as their distinctiveness in comparison to some other FP activities. Furthermore, the impression that large and long-term projects and networks are specifically preferred should be corrected. More flexibility and adaptation to external circumstances should be allowed.

The successful ERA-NET scheme, which commenced under the FP6 regime, should be continued and further strengthened. Given its success and advantages for the National Research Councils, the ERA-NET+ proposals deserve endorsement. ALLEA assents to EU financial support being offered to European intergovernmental research organisations if their research is beneficial to the European Union.

If the major challenges to countries or regions' technological developments were defined well, if sufficient political support were given, and if a constructive collaboration between industry and academia could be realized, the proposed Joint Technology Initiatives could become successful enterprises, particularly to encourage industrial involvement in and funding for R&D.

The promotion of a scientific and educational culture, the furthering of public engagement through dissemination of scientific information, an honest dialogue with the general public through non-scientific media, and placing responsible science at the heart of policy making are crucial conditions to enable science and society to progress in harmony. ALLEA supports the activities as proposed in the 'Science in Society' programme in this respect and welcomes the over-proportional increment of the funds reserved for this programme, which is fully justified.

The present FP7 proposal does not deal extensively with the subject of intellectual property. However, ALLEA does want to bring this subject, which is of vital importance for the development of European science, to the fore, and repeats a number of concerns and recommendations with respect to the IPR system in Europe. In this reaction, ALLEA and its member academies once more warn against the further erosion of academic norms and the tightening of IP legislative frameworks to the detriment of the academic enterprise.

Introduction

On the 6th of April 2005, the European Commission made public the plans for a new EU research programme in its Proposal for a 'Decision of the European Parliament and the Council, concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007 to 2013)'. The proposal for a Council Decision is titled 'Building the Europe of Knowledge', and the political context and objectives are formulated in the Commission's Communication, titled 'Building the ERA of knowledge for growth'. A great many ideas and plans that have been discussed by the Commission in its interaction with the scientific community in Europe during the last few years have been given shape in this Framework proposal. All European Academies (ALLEA), the European Federation of national Academies of Sciences and Humanities, welcomes the opportunity to reflect on this proposal, and takes the liberty of offering its observations for further consideration.

In this response, ALLEA will formulate a few critical observations on the proposed FP7. It will concentrate its comments on a number of separate topics dealt with in the four themes, namely co-operation, people, ideas, and capacity; themes around which the plans and propositions have been neatly arranged. We will deviate somewhat from the exact sequence of these topics in the proposal, and develop a line of thought that reflects the academies and ALLEA's primary concerns and responsibilities. We will also refrain from commenting on issues that are not of primary interest and relevance for ALLEA and its member academies.

General observations

Funding of fundamental and strategic research

In general, ALLEA strongly approves of the Commission's ambitious proposal. ALLEA has always endorsed the view of a great majority of the players in the European science arena that support for research should be strengthened at the European level, that this would have an important impact on Europe's research capacities and capabilities, and would contribute significantly to Europe's competitiveness, social wel-

fare and sustainability. Knowledge is Europe's richest resource, and the concerted efforts to exploit this resource, as is proposed in FP7, will indeed provide a strong impetus for Europe's further growth and competitiveness.

ALLEA and its member academies have a particular responsibility and expertise in the areas of fundamental research and the education and training of researchers. As will become clear in the more specific discussion below, the treatment of these two areas - fundamental research and people issues - have been closely followed and carefully analysed by ALLEA. Obviously, ALLEA welcomes the support for fundamental, investigator-driven research in all scientific, scholarly and technological domains, including social sciences and the humanities, that is expressed in this part of the proposal. Fundamental research has to be supported for two important reasons: In the first place because research, be it in sciences or in the humanities, leads to an augmentation of the body of knowledge, which is an intrinsically valuable and precious quality of civilisation. Moreover, such an augmentation has an important educational impact with respect to the next generation of scientists as well as the broader community. The scientific enlightenment of the general public can, in fact, be regarded as an important instrument with which to develop and to strengthen the intellectual defensibility and the democratic foundation of a society. This is what can be called intrinsic relevance.

But there is also a second justification for supporting research: and that is, of course, its instrumental relevance, its undeniable contribution to the economic and technological development and social welfare of a society. ALLEA fully agrees with the Commissioner's views that the stimulation of research and development is one of the crucial conditions for the realisation of the Lisbon objectives. Europe will only achieve competitiveness and leadership on the global market if it takes the lead as a knowledge economy and society. The development of knowledge - and especially new knowledge - is a *sine qua non* for the future of Europe.

In this respect ALLEA concurs with the views of the 'Ormalá Panel' (2005), which reviewed the current and previous Framework Programmes, that these programmes have corrected some of the deficiencies of the European RTD landscape, have contributed positively to Europe's research and innovation, and that the European Union as a whole should invest more in RTD to respond appropriately

to the challenges to maintain and build on this success. These views are also supported by the report of the High Level Group, chaired by Wim Kok (2004), on the mid-term evaluation of the Lisbon process that recommends, among others, a substantial investment in R&D and in education and training, dictated by the need for Europe to become more attractive for researchers and scientists. ALLEA therefore welcomes the continuation of the programme, and endorses many of the ideas and suggestions for improvement put forward in the draft proposals for the 7th Framework Programme. It further notes with approval that quite a few of the laudable aspects of the previous programmes have been continued, and that a number of objections to and obstacles in these programmes, including many of those reported in the Marimon Report on the effectiveness of the 6th Framework Programme's new instruments (2004), have been defied.

It should be recognised that the Framework Programme, particularly the strategic cooperative component, is directed at supporting significant European policy issues and at developing the EU economy in its widest sense. ALLEA endorses the inducement offered to research with an international (in this case, in particular, European) collaborative character in view of the trans-national (EU-level) approach's added value. Solid arguments can be advanced for this added value:

(1) Firstly, many of our highest priority issues are international in character. One cannot study the environment, infectious diseases, transportation, trade, migration or economic recession from a purely national perspective. We have to collaborate to get a full picture of many pan-European policy issues.

(2) Secondly, only at a higher (*e.g.* EU-) level of aggregation can research create the required critical mass that individual countries often fail to achieve.

(3) Thirdly, it helps to create and to enhance research skills and knowledge in a wider Europe by bringing junior researchers from different regions in contact with cutting edge research, and thus improving the European research capacity.

(4) Fourthly, national funding alone falls short of what is needed for many of the mega-programmes and only combined efforts can provide the necessary infrastructure and means. Moreover, an increase in EU funding will also stimulate the (badly needed) private investment in research in Europe. It cannot be denied that a very important challenge facing Europe in the area of research is to increase its private sector

R&D. The level of expenditure on industrial research in Europe is much lower than in the US, and in Europe far fewer industrial researchers are employed than in the US. In most newly ascended countries specifically, private R&D expenditures are low and need a significant boost.

(5) Fifthly, EU support stimulates improved integration of the currently often fragmented and duplicating research, co-ordination of national strategies, and a much wider dissemination of results than is realised with respect to national research. In the US, the main source of public funding is federal; in Europe, national funding still exceeds central EU funding by a factor greater than fifteen. Of course, Europe and the US cannot be fully compared on this point. Europe has a complex pattern of policy-making and funding of academic research and it is important to recognise the appropriate level (region, member state, EU) of funding as well as the important principle of subsidiarity. A right balance and proper complementarity between EU and national funded research have to be sought. Nevertheless it cannot be denied that this complex pattern has harmed Europe's position.

(6) Finally, Europe needs to strengthen its competitive position worldwide. The differences in the effective use of knowledge in industrial application and in output between Europe and, for instance, the United States and Japan are uncomfortably large in terms of economic and industrial development and still growing. Increased co-operation and harmonisation are badly needed.

In view of these strong arguments regarding the importance of EU intervention in research funding both for fundamental research and cooperative strategic research in Europe; the significant enlargement of the number of potential participants in the 25-member-state Europe; the urgent need for new research, and the far too high a percentage of rejections - even of research proposals judged to be very good - under the previous Framework Programmes, ALLEA wholeheartedly supports the proposal to double the EU research funding. The Commission's proposed increase in the research budget - strongly endorsed by the European Parliament (*Research Europe*, 3 February 2005) and the European Parliament's Committee on Industry, Research and Energy (Cordis, March 2005) - is an important and necessary precondition for the strengthening of the European research capacities and for bridging the gap between RTD and innovation, which will help to achieve the EU's aspired global leadership in science and technology.

Administrative control and procedures for application and review

In this section we make some observations on the procedures for application and review in the previous Framework Programmes and in the forthcoming one. It is indeed an important and laudable plan to make the operation of the Programme more attractive to participants. In the past, they have complained that procedures are too long and cumbersome as well as too inflexible to accommodate changes in the scientific environment during the execution of the projects. Rules for handling sub-contracting have been applied too rigidly, and the auditing costs are sometimes prohibitive. Systems for calculating and controlling the financial contributions have been complex, the language jargonese, and the forms and explanatory documents difficult to understand. This is particularly true for smaller research groups, for younger, less established institutes, and the researchers from the new Member States. Participating researchers and institutes have always preferred more forfaitary instead of cost-based funding as well as ex post accounting rather than ex ante control. Participants in the FPs welcome grants with few bureaucratic strings attached and enough flexibility to allow them to react adequately to required changes. To date they have also found the requirements for preparing and submitting proposals too complex and demanding, given the slight probability of acceptance. In view of these complaints, ALLEA is happy with the Commission's intention to enforce administrative simplification in respect of FP7.

ALLEA particularly concurs with the recommendations to simplify the application process for research funding under the Framework Programmes. The current single-stage evaluation process has led to demotivation of researchers, since they have to make a disproportionate effort to prepare applications with a very slight probability of success. A two-stage process, with the submission of a short description of the research's intentions and objectives in the first phase, and a more elaborate application for selected proposals in the second phase (with at least a 1:3 chance of success), will be more efficient and less frustrating. It has to be recognised that a two-stage evaluation process runs the risk of requiring more time, which will require strict monitoring of the review process.

ALLEA also endorses a regular 'mid term' peer review, on the basis of which projects with little likelihood of success should be terminated, allowing the funds to be spent on new and more promising proposals.

A special word on the equal matching requirement: In principle, matching cannot be faulted; it stimulates an institute's active involvement and ensures that it provides serious support. It is obvious, however, that institutes and universities in Europe greatly diverge regarding the availability of matching funds. It would be deplorable if excellent research groups in Europe were prohibited from participating in the programme purely on financial grounds, and their places taken by less excellent groups that do have access to such matching institutional funds. A general increase in the percentage paid by the EC would probably be considered fairer than a differentiated matching system.

Finally, ALLEA expresses the hope that the EC rules regarding the rotation of public officials within services will not be applied too strictly in the case of Scientific Programme Managers. This would have a negative effect on the required in-depth knowledge of the scientific fields, and on the continuity and fairness of both the allocation decisions and the follow-up measures.

Frontier Research

Fundamental research

In the foregoing, support for scientific research as justified by its intrinsic as well as contributive relevance was defended. However, one would be mistaken in regarding this distinction as similar to that between fundamental and applied research. Fundamental, science-driven research is indispensable for the development of new knowledge, which not only has an intrinsic value, but can also lead to important industrial innovations, to breakthroughs in the technological or societal applications, and to economic growth and increased well being, sometimes directly, sometimes quite some time later. In an economy that is expected to become more and more knowledge based - and that is the case in the EU-countries - support for cutting edge research is a *sine qua non* for growth. Fundamental research clearly

plays a role in underpinning the development of innovation in European business and public services.

ALLEA assents to the two distinct ways of supporting fundamental research in the proposals for FP7: Firstly, to support the best European research teams with the aim of achieving a higher impact on world class research (as is proposed by the foundation of an ERC). No requirement for international collaboration is stipulated; it is the quality of the proposal that is the deciding factor. Of course, top class research teams are already internationally oriented and will already have attracted international researchers in their own right. Secondly, to support the building of a strong European scientific capacity in areas of relevance to Europe's strategic needs. International collaboration is a prerequisite for most of these research endeavours, both to achieve the highest quality and with a view to economy of scale. ALLEA generally concurs with the proposals for the advancement of strategic research with respect to themes in European science and technology that need to be strengthened in order to address the economic and social challenges in the Europe of tomorrow. ALLEA is also happy with the room given to attempts to answer more fundamental questions in these cooperative research programmes. In the section European Cooperation - Themes below, we will expound the evaluation of this aspect of the FP7 proposals.

At this point the need to recognise universities' place in this development of a European capacity needs to be stated. The continuity of the scientific discourse appears to its full advantage in a dialogue with the next generation. The relevance of science is strongly related to its educational mission: the transmission, revalidation and further development of scientific knowledge in education and training, and in the enrichment of the next generation with knowledge and insight. Universities have developed into dynamic long-term repositories of knowledge and it is not easy to overestimate their role in the desired capacity building in Europe. ALLEA wishes to stress the need for European grants for universities and university groups to be on a sustainable basis and not to drain university resources too much.

European Research Council

A few years ago an editorial comment in *Nature* (21 June, 2001) cautioned the ERA by saying that a European Research Council is likely to remain a stillborn vision unless there is an independent, flexible and self-administered pan-European funding body, which - unlike the ponderous Framework - can react quickly to unexpected scientific developments. In an almost immediate compliance with this precondition, ideas for the creation of a European Research Council have gained momentum through the preparatory work of the European Research Council Expert Group (ERCEG), laying the foundations for a new European basic research policy. The ERCEG proposed creating a fund for science-driven research first, and, secondly, an agency to manage this fund. The principle of allowing a researcher in any European state to compete with all others on the basis of excellence presents a new definition of European added value and is an improvement on the one used hitherto, which merely entailed the collaboration of research teams from different European countries.

ALLEA has always upheld the vision that, given the widening gap between Europe and its main global rivals in the field of science and technology as well as the decrease or stagnation of research funding in many European countries, a concentrated effort to develop a true and partly re-modelled European research policy, including its funding, is necessary. For this 'European Research' we need more than the sum of the different national research programmes, the intergovernmental co-operation agreements (Eureka, Cost), the co-operative arrangements within some disciplines, such as AMICA (agriculture) and CERC3 (chemistry), or the 'big science' institutes such as CERN, EMBO, ESA, ESO, as we have at present. ERA and FP6 were important steps forward, but remained Community instruments for which the partners' consent was needed (art.166 Treaty of Amsterdam). Within the context of the classic FPs, it was extremely difficult to transfer (some of the) national resources to a European level. Moreover, the requirement of fair participation and the acceptance of countries in collaborative projects for formal (political?) reasons may have been useful and defensible, given the need to build a balanced research workforce all over Europe, and to help and train the less advantaged participants, but did not always lead to top performance and excellence.

According to the present draft proposal, the ERC will be created by the European Union (and thus by the heads of state) and will be politically accountable to the EU, but will operate as a scientifically autonomous body, based on the advice and guidance of the European research community. The main task of the ERC is to support investigator-driven fundamental research of the highest quality in a strongly competitive mode, with applications evaluated by international peer review. The research proposal could refer to work of larger collaborating groups, but also to that of small teams or individuals. There are no longer requirements for international co-operation between three or more EU-member countries.

ALLEA wholeheartedly supports the creation of an ERC as is proposed in the Draft Proposal. Naturally, ALLEA has adhered and will adhere to its view on the ERC as a council, funded by the European Commission, but autonomously run by scientists, supported by the scientific community, employing scientific excellence on the basis of peer review as the sole criterion for selection, at arm's length from politics, and attempting to avoid bureaucracy by providing grants in stead of co-financing contracts. Only when this primary objective of furthering excellent research has been achieved, should other tasks be considered for the ERC, such as those associated with researcher mobility, and the development of the scientifically weaker regions in Europe. Moreover, with respect to the Central and Eastern European states' participation, a liberal and generous participation policy should be adhered to; this not only for reasons of fairness and European solidarity, but also for Europe's own benefit: we need to mobilise all the scientific expertise available within its borders!

As far as the ERC's legal structure is concerned, ALLEA has always emphasised two central principles: (1) accountability to the 'owners' of the ERC in accordance with the political and financial responsibilities that lie with the Commission, and (2) full responsibility for the total operation as such (criteria, instruments, procedure for evaluation, and granting decisions) being in the hands of the scientists themselves. It was felt that this could best be realised by delegating this responsibility to the Governing Council, which would be composed of researchers of excellent reputation. ALLEA is glad to learn that these two principles seem to be followed in the present proposal.

Competition and equal development

ALLEA is aware of a possible tension between the principle of competition for excellence and that of equal development. Due to less favourable economic conditions and sub-optimal infrastructures, many excellent scientists in Central and Eastern European countries cannot compete on an equal footing with their Western colleagues. After thorough consultations with the Presidents of ALLEA's member-academies from the 'accession countries', unanimous approval was, however, reached for maintaining 'scientific excellence' as the sole criterion for ERC-granted support. (See ALLEA's memorandum 'Excellence and equal access to the European Research Area', 05 January 2004). They also agreed that scientific quality is a *sine qua non* for the promotion of top-level research in Europe. We agree therefore with the position taken by Commissioner Potocnik (*Cordis*: News service RCN 23226) that frontier research funds from FP7 should not be used for solidarity purposes.

At the same time there was also general agreement that specific measures should be taken to ensure that these countries would be able to gain on Western European countries and in due course draw level with the rest of Europe. This could be realised, as was also suggested by the Commissioner, by using part of the so-called solidarity instruments [Structural Funds (ERDF, ESF, EAGGF, FIFG), and Cohesion Fund]. According to the Commissioner's proposals for the New Structural Funds 2007-2013, structural funding is meant to remove the regional imbalances in research innovation, training facilities and infrastructure. It would be meaningful if the recipient countries could be persuaded - or possibly obliged - to reserve a certain percentage of these funds for such RTD purposes. This is in agreement with a recent EURAB advice (EURAB 04.037) that it is crucial to convince recipient states of the importance of investing in R&D, and to reserve a significant part of their revenue for this purpose. Whatever the case, it is desirable to combine the cohesion and structural funds with the FP7 instruments in an effort to improve the research infrastructure in the economically less privileged European countries.

Research infrastructures

To date, the Commission has financially supported collaboration on increasing the infrastructures' performance, and providing access to these facilities. The vision of a co-ordinated analysis of Europe's needs in terms of infrastructural facilities is new, as is the Road Map to be developed by the European Strategy Forum on Research Infrastructure (ESFRI). The creation of ESFRI is an important step towards a co-ordinated development of an infrastructure of European interest.

ESFRI seems to be concentrating on such large-scale infrastructures that they require governments' intervention. Examples are large and expensive infra-structural investments such as those encountered in natural and life sciences, but also categories that are not mega-sized, but are still beyond a single country's reach, need such co-ordination and support. Examples of these are distributed communication structures, electronic libraries and archiving systems, social and bioinformatics databases, systems for trans-national surveys (social science survey, Euro-barometer) etc. Moreover, in addition to pan-European initiatives, also regional proposals deserve attention.

Human Resources

The aim of the Commission is to make Europe attractive to the best researchers. A major factor in achieving this goal is ensuring that European research is excellent and is increasing its world wide impact. We have discussed this condition extensively in the foregoing. But there is also the need to stimulate the mobility of students and researchers. ALLEA has always strongly endorsed programmes fostering such a mobility, providing rewarding and attractive career opportunities in science, and attracting visiting researchers from other continents to European institutes and universities. ALLEA regarded the Curie scholarships in the 6th Framework Programme as one of the more fruitful and effective attempts to overcome arrears in scientific progress in respect of the rest of the world, in the long run. In fact, it was distressing that so many good proposals and applications in this programme could not be honoured. ALLEA is pleased to see that more generous means are made available for this purpose than under the previous FP, and welcomes the substantial budgetary increase for these

actions. In principle, the co-funding of national and international research programmes aiming at life-long training and career development could work out favourably, but a warning is issued against a too rigid and too bureaucratic control. Opening some of the Marie Curie actions for non-EU applicants as well, should perhaps be considered.

In an earlier communication to Commissioner Busquin, ALLEA had already expressed its grave concern regarding the declining attractiveness of natural sciences and engineering to students in many European nations. The 'High Level Group' chaired by J.M. Gago (2004) also calculated that 700.000 additional researchers would be needed for the realisation of the Lisbon objective. ALLEA further emphasised the importance of a number of measures that could stimulate the appeal of the European scientific work environment and that could reverse the present net outflow of human resources in science and technology from Europe to the US, including:

- A substantial increase in students and young researchers' mobility throughout Europe. Students should have the widest possible choice across Europe. Not only does this require higher levels of funding, but also consistent high supervision and coaching standards. In this connection, ALLEA welcomes Educational Commissioner Figel's initiative to call for three million 'Europasses' to be issued by 2010, collating existing higher education diplomas and qualifications within a special Europass supplement. Mobility would be further advanced if more attention were paid to a system of European accreditation of national diplomas and credits to improve the transparency and comparability of such qualifications. ALLEA would support initiatives to clarify the accreditation's position in the overall picture of transnational recognition within the European area. It prefers a system with a central agreement on key principles of quality assurance, and mutual recognition of national accreditation activities.

- Encouraging the development and implementation of programmes to raise interest in sciences at an earlier stage in youngsters' development. The declining interest of students in natural sciences and engineering may also be related to the general public's perception that science and engineering are a remote domain, far removed from their daily concerns. There is, therefore, also a need to improve the level of science and engineering's appreciation and prestige in society (see also 'Science in Society' below).

- The stimulation of more women to pursue a scientific career by trying to further and reward intrinsic interest in sciences, but also by creating favourable conditions for such a choice, including the creation of more part-time functions, temporary employment, opportunities to work at home on a larger scale, provisions for children etc. Indeed, the large potential of female scientific research capacity should be more fully exploited.
- The stimulation of more flexible retirement, or post-pension (temporary) contracts so as to stop the sudden outflow of experienced scientists at (mostly) 65 and the loss of human capital via early and mandatory retirement programmes. It is well known that a considerable percentage of senior scientists would prefer to continue their work if they were not prevented from doing so for legal reasons (mandatory retirement), or inflexible working conditions. Surveys show that they prefer fewer working hours, fewer executive and supervisory responsibilities, more reflective and consulting or coaching tasks, but, as said, very often they favour continuation of their work in some form or another.
- Encouraging an increased influx from outside Europe by making scientific employment in Europe more attractive, for instance, by creating high-level research groups that could be attractive to non-European researchers, and by removing many formal, legal and social obstacles that frustrate an optimal inflow and mobility of such scientists at present. Investment in the provision of better research facilities (equipment, computer and communication infrastructure, survey and library facilities) is another prerequisite that will attract foreign students and researchers. It is a well-known fact that for many scientists such an optimal infrastructure is a more motivating condition than a purely financial remuneration. An important further condition is the simplification of legislation and the elimination of formal and bureaucratic barriers to foreign PhD students and researchers' mobility.
- The creation of sufficient space for science-driven, fundamental research. Many young scientists are attracted to a research climate where scientific creativity is treasured and where scientific criteria are predominant in the evaluation of projects and the competition between scientists. This is another motive for the support of frontier research and the creation of an ERC, as has been discussed above.

ALLEA realises that a number of these proposed measures do not fall fully within the European Commission's remit, and that they need the national governments and Ministers of Research and Education's initiatives and support as well, but joint efforts, stimulation and co-ordination where possible should create favourable conditions for the realisation of this important objective.

European Cooperation

As has been discussed above, two ways of fostering high level European research can be distinguished: First, to avail the very best European research proposals and the very highest quality researchers, without requiring international collaboration. This goal is being pursued through the creation of an ERC. Secondly, to support the building of a strong European capacity in areas of relevance to Europe's strategic needs. With respect to the latter, the potential users have an important say, and collaboration across member states is fully justified.

Themes

The FP7 includes a fair amount of continuation of the 6th FP as far as the themes of co-operative research are concerned. Those themes were undeniably carefully selected as major developments fields in science and technology that need to be strengthened in order to address the European Union's present and prospective social and economic challenges. While ALLEA does not in general dissociate itself from the chosen course, it would like to make two critical observations:

In the first place a remark with respect to multidisciplinaryity. Special attention will be paid to priority scientific areas that cut across themes, as is explained in ANNEX I, p.13 (of the EC Proposal) and as is illustrated by using the examples of marine sciences and technologies. Here the proposal should have seized the opportunity to really expand and elaborate the theme of inter- or multidisciplinaryity. A great many more examples should have been offered in which interdisciplinary approaches could have been demonstrated as useful and innovative. A few examples are: the interactions between agriculture and farming cultures, between informatics and cognitive psychology, between

energy and sustainable consumption (behaviour of the user), between health and environment, between nano-sciences and biology or even philosophy and ethics, between transport, communication and health etc. Suggestions to study these and a great many other examples could have meant an important breakthrough in the focussing of Europe's strongly compartmentalised academic science and learning which is primarily shaped along disciplinary lines at present. In ALLEA's view, it will be a missed opportunity if FP7 does not open the way to a really interdisciplinary approach to the complex problems that Europe faces.

Secondly, an observation regarding the potential role of social sciences and humanities. In the proposal there is one theme in which socio-economic sciences and the humanities are represented in a joint 'socio-economic sciences and humanities' programme. In principle, one could acknowledge that much of the research in the humanities and social sciences has an intrinsically relevant character (see above), and that proposals in this domain should compete with other excellent scientific and scholarly proposals to be dealt with under the ERC regime. The social sciences and humanities will certainly join the competition for excellence in fundamental, cutting edge research. But a repudiation of the social sciences and humanities' practical relevance, and considering these disciplines as having no contributive relevance would be a major mistake. These disciplines most certainly deserve a place on the list of themes to be supported under the 'collaboration' heading.

However, on looking at the description of the objective and activities under this heading, ALLEA is disappointed with the humanities' weak role in this theme. In fact, even the social and behavioural sciences are not fully exploited in these descriptions, which primarily focus on growth, productivity, employment, European Union citizenship, societal developments...., but do not refer to crucial issues in future developments, such as ICT and learning, cognitive functioning and ageing, recreation, individual mental health, schooling and literacy, drug and alcohol abuse and violence, and many other issues that have a grave affect on the development and well-being of society.

More striking is the almost complete absence of the humanities' envisaged contribution: The importance of the analysis of culture to understand societal processes, the definition of the European cultural area, the importance of history to learn how things have developed as they did and to learn from mistakes by individuals and governments in

the process, the need for a more in depth analysis of existing social conditions, intellectual histories and political systems in order to understand the motives and conflicts of peoples in a rapidly changing world, the saliency of philosophical and ethical reflections on norms and values that motivate decisions and behaviour, the conspicuous role of different religions, languages, artistic, musical and cultural patterns, landscape and architecture in the shaping of Europe....such knowledge needs to be amassed through research, study and reflection, and needs to be available to avoid having to spend much money later to repair the damage inflicted upon society. The same cogent message has been articulated by the Academia Europaea in a statement on the role of the humanities in the European Research Policy (September, 2004).

ALLEA therefore proposes splitting the theme 'Socio-economic sciences and the humanities' into two themes. One described as 'Behavioural and Socio-Economic Sciences', comprising much what is proposed in the present theme, plus the above described broadening of the approach through the behavioural sciences' input. The other theme could be called 'Humanities in Europe: Understanding culture and civilisation', focussing more specifically on the humanities' broad and rich contribution to the development of mutual respect and cultural reciprocity - conditions so important for a fruitful and peaceful co-existence in Europe.

Instruments for collaborative research

In FP6 new instruments such as Integrated Projects (IP) and Networks of Excellence (NoE) were introduced. It is understood that the use of these instruments will be continued in the next Framework Programme. We note that the distinction between the nature of and the criteria for the two instruments and between these criteria and those of other FP activities is not always sufficiently clear, and we suggest making the goals of the two instruments more distinctive and specific. Certainly the distinction between IPs and regular large projects, such as those supported, for instance, in the STREPS (specific targeted research projects) programme, should be better clarified.

Secondly, it appears, or at least this is the perception in the scientific world, that the New Instruments should be very large. Of course, there should be some critical mass, but the optimal size depends on the

subject, the potential participants and the added value, and this could differ substantially over disciplines. An additional impediment is that the very large programmes and network spend a relatively large part of the financial resources on management and administration. The suggestion that 'big is beautiful' creates a further bias in favour of established research groups, and diminishes the chances of innovative, daring and risky proposals.

This biased suggestion does not only apply to the IPs, but also to the NoEs. Here, again, it can be argued that smaller networks, as particularly found in social and behavioural sciences and the humanities, can be of top quality and deserve recognition as well. In addition, with respect to the Networks of Excellence, more exclusive emphasis should be put on excellence. To date, a multitude of additional criteria and considerations seem to have been applied, including political criteria, representativeness of the whole of Europe, considerations of cohesion and integration, ethical issues, gender distribution, and others (according to Vandenberghe, as quoted in *Onderzoek Nederland*, 120, 26 March 2004). In keeping with the concept, NoEs should primarily emphasise excellence. Moreover, one should not be too rigid about the duration of networks. Sometimes they have to continue for a fairly long time, sometimes it is advisable to allow a shorter duration, depending on the subject and the dynamics within the network. In general, sufficient flexibility and adaptation to external circumstances should be allowed.

A final remark: the new instruments may have proven their worth, but not as a panacea for all problems in collaborative research. The excellent classic single collaborative projects deserve a suitable place in the next period as well.

Co-ordination of national programmes

ALLEA has noted that the efforts to improve the national research programmes' co-ordination had been successfully applied in the 6th FP. The ERA-NET scheme was quite an achievement and certainly deserves continuation and further strengthening. The proposal to extend the co-ordination by merging national programmes into one single programme, which is possible by applying Art. 169 that had been unused until recently, seems a worthwhile initiative. The positive

experience with the successful European and Development Countries Clinical Trials Partnership (EDCTP) justifies this positive expectation. ALLEA also approves the plans to not only support the costs of co-ordination, but also part of the project costs of those ERA-NET projects that will change into joint calls.

The advantages of the ERA-NET+ proposal for the National Research Councils are obvious: the experience of international collaboration and the compulsory obligation to clear the hindering barriers to such collaboration, the achievement of scale and scope in science-driven research, the optimal nurture and growth of excellence, the creation of promising career paths for (young) researchers, and the organisation of a European system for review, and benchmarking and best practices in the evaluation and selection of the most promising proposals. ALLEA endorses the proposed course for all these reasons.

ALLEA also assents to EU financial support being given to the European intergovernmental research organisations' activities, particularly to those activities that are beneficial to the European Union. It is important to strengthen the ties between these institutes and the Union.

Joint technology initiatives

Although ALLEA, and its member academies' primary affinity lies at the science end of the 'science - applied science - development – implementation' chain, ALLEA is not heedless of the technological implementations of research and recognises the importance of its findings' industrial and societal application. And the involvement of industry herein is crucial. To date, Industry has been disinclined to invest in research unless the right regulatory framework and conditions for production and marketing of the end products are provided. It is in respect of the latter that many companies have remained hesitant. The creation of the EU's technology platforms, launched some years ago, raised hopes that a change would occur and that companies would increase their investment in research. Within such platforms, stakeholders from industry, academia, governments and the European Commission jointly determine a research agenda for various sectors in Europe. The EC intends to continue this initiative in FP7 in the form of joint technology initiatives, which ALLEA considers a welcome decision. It must be stated, however, that also in the next FP, the

success of these platforms depends on both the vision and quality of the programme, and the extent to which the players 'industry' and 'academia' take this process seriously. A careful selection and articulated definition of the major challenges, a clearly felt need for such a platform, strong political support, a high visibility and level of acceptance, and a constructive collaboration between academia and industry are important conditions for the technology platforms' success. Only then will the programme attract additional national support and industry funding.

Other Issues

Science in Society

The aim of the European Commission's 'Science in Society' programme to pool European efforts to develop strong and harmonious relations between science and society is very much welcomed by ALLEA's member academies. As was correctly stated in the 'Science and Society Action Plan' of 2002, there are indications that the great scientific potential in Europe is out of step with European citizens' current needs and aspirations, such as peace, jobs, security and the sustainable development of the planet.

Indeed, science is no longer taken for granted. There are still high hopes and expectations for science's contribution to prosperity and welfare, but at the same time we too often note that widespread public appreciation has been replaced by doubts, scepticism or even enmity. Many of these negative attitudes and sentiments are fed, in part, by fear; fear of a lack of control over the possible effects of scientific developments: nuclear waste, environmental deprivation, the horrific consequences of genetic modification, emerging dangerous viruses and bacteria, loss of liberty and privacy through ICT developments. And, perhaps also, fear of a dominant scienticism and secularisation, and a deprivation of religion and spirituality.

Not all criticism is objectionable. Some of the captious questions posed to present to scientists are amenable to reason and require careful attention. Are scientists always aware of the potential and/or ethical consequences of their research, especially when this is applied and used by others? Are scientific practitioners capable of dealing with new-

found knowledge judiciously? Have scientists sufficiently freed themselves of unwanted intrusion of influence? Have they protected research subjects against the infliction of harm and exposure to unacceptable risks? Questions and criticisms like these cannot be arrogantly ignored by science. If not given serious attention, they may erode the axiomatic quality of science and even pose a threat to science as an intellectual endeavour. Moreover, since these attitudes may influence the general public, they may also have an unfortunate effect on the willingness of political leaders to reserve the necessary funds for innovative and frontier research. It goes without saying that public opinion, the sentiments of voters and the tone of the media debate largely determine the boundaries imposed on scientific practice at the beginning of the 21st century. And, as stated, these sentiments are unmistakably more sceptical and negative than in the past.

It is clear that a furthering of public awareness through dissemination of scientific information and an honest dialogue with the general public, the promotion of a scientific and educational culture in Europe, and placing responsible science at the centre of policy making are actions that have a high Community added value and are important stimuli for a greater acceptance of science in society. Moreover, Europe can play a leading role on the world stage by promoting global partnership, co-operative activities and dialogues between scientists and the public at large in their quest for equal opportunities and shared values.

In the FP7 proposal, it is envisaged that 'Science in Society' actions will take place along three different lines: (1) the embedding of the theme throughout the 7th Framework Programme (through the introduction of social/ethical themes and communication strategies in the content and operation of the FP's various components), (2) defining of and focussing on a number of core themes in the interface of science and ethics, and (3) the co-ordination of national programmes and policies tailored to the social/ethical issues in science and technology.

ALLEA considers this a fruitful and effective approach. It particularly wants to emphasise the importance of the embedding of the social/ethical view in the regular projects and programmes. The objectives of ensuring public confidence in European research and its applications, of strengthening the scientific workforce and providing better career opportunities in science, and of developing trust in and appreciation of science through various policy-related initiatives and

well monitored communication can best be achieved by the integration of 'Science in Society' throughout the whole 7th Framework Programme, and not (only) by focussing on underpinning research with a dedicated budget, although the latter, can, of course, ill be spared. ALLEA welcomes the over-proportional increment of the budget reserved for this purpose, which it considers fully justified, given the projected ambitions and the growing importance of the new science and society partnership in Europe.

International co-operation

Part of the proposal regarding international co-operation deals with an issue to which ALLEA and its member Academies have always given and will continue to give high priority. What has been proposed in FP7 deserves support and, possibly, strengthening. The internationalisation of research cannot and should not be restricted to the European Union countries. Scientific collaboration already occurs between EU member and non-EU-member European countries, and this should be further extended. Such a support would not only strengthen new candidate EU member countries' intellectual research capacity and experience, but also provide an opportunity to enjoy the benefits of collaboration with neighbouring countries, and thus make optimal use of the intellectual resources in the greater Europe. In fact, the proposal speaks of intentions to further encourage and stimulate regional co-operation. This is a laudable idea that we have endorsed, also in a discussion on the potential benefits of regional collaboration in the Balkan area (see Drenth, 2004). Having both EU member and non-EU-member countries represented in such regional networks, if required for economic and geographical reasons, should not be excluded.

In addition, the international collaboration with non-European countries should also be further encouraged. This should first of all be done in the context of world-wide programmes such as global change, space research, world health and food problems, research on terrorism and others, and in which Europe should actively participate. Secondly, this should be done more specifically with respect to research issues and areas that are politically or economically important to Europe, and in which an exchange of knowledge and an influx of non-European experts would be beneficial for the advancement of scientific know-

ledge in Europe. Thirdly, Europe should welcome collaboration with ambitious and well trained researchers from emerging economies like China and India, that are (becoming) important industrial and trade partners as well as fast growing consumer markets for European products. An excellent example of such an initiative is the programme CO-REACH (Coordination of Research between Europe and China), coordinated by the Royal Netherlands Academy of Arts and Sciences and launched in May 2005 in Beijing, in which 11 European Academies and science organisations participate; it is the first European - non-European collaboration funded within the ERA-NET scheme of the Framework Programme.

Finally, ALLEA would like to make a special plea for collaboration with developing countries. European research and knowledge could contribute to the alleviation of the large social, environmental and health backlogs in these countries. Co-operation activities are envisaged in the areas of sustainable development, sustainable use of natural resources, including agricultural production and food security, environmental and energy aspects, and health and nutrition. Cooperation with local scientists will generate new perspectives and better understanding of what is needed for those countries. Further-more, at present many European countries and Academies already have bilateral agreements and programmes with developing countries, but the existing highly fragmented system of co-operation could be significantly improved by European co-ordination and collaboration, thus reducing duplication and wastage of resources. To date, this collaboration is often characterised by assistance in training and research, infrastructure support and providing information. But this assistance can gradually help these countries develop their own S&T capabilities, so that they may become true co-operation partners in the longer term.

Such assistance and support is partly for Europe's own benefit: stimulating developing countries to study global problems in which they are (sometimes heavily) involved, expanding knowledge of health issues and diseases that may effect Europe through increasing migration and travel, improving living conditions to reduce the economy-driven migration, and growing markets. But this assistance should also stem from feelings of solidarity and a genuine desire to see improvements in the well-being of poor populations. Collaborative research may offer these populations help in the form of applicable knowledge and skills to overcome the difficulties caused by economic

stagnation, natural disasters and social, educational and medical deprivation.

Intellectual Property Rights

Although the present proposal itself does not deal extensively with the subject of intellectual property (it only refers to the need to link with other EU policies, 'such as Intellectual Property Rights' (p.65), the subject is of great importance to ALLEA, and we would like to give it appropriate attention in this reaction. At the beginning of this year, the Commission held a first round of discussions to prepare new rules for intellectual property rights arrangements under Framework 7, and these consultations do not seem to result in drastic changes in the IPR regime. As is concluded in *Research Europe* (3 February 2005), the basics of the current regime will be kept intact, although some amendments are introduced, particularly concerning the rules that limit the ability of consortium partners to transfer their IP to subsidiaries and the access rights that enable firms to utilise their partners' discoveries. Quite a few agreements in the 6th FP that regulated the delegated responsibility to the consortium partners proved inadequate or unclear, and the clarifications or specifications in the present proposal are considered improvements. Also the attempt to better utilise the IP by allowing other partners in the consortium to take it over from a partner that does not want to exploit it, instead of transferring that right to the Commission, is an amelioration.

One of the suggestions is that universities and publicly funded institutes should be encouraged to more actively consider whether they could exploit discoveries made during a project. This is an important consideration; too much IP goes to waste at the moment. ALLEA would, however, also like to warn against the undesirable effects of such strong pressure. Firstly, universities and institutes may reduce open communication if patents seem likely, and, secondly, they may bring some pressure to bear on researchers to select topics that could lead to patents. Obviously, there is a need for a balance to assure that the research findings within Europe are exploited as far as possible, while ensuring that the programme of research and its dissemination is not hindered.

More importantly, ALLEA regrets that a number of undesirable and harmful objections against the present IPR system in Europe have not been tackled satisfactorily. Advised by its Standing Committee on Intellectual Property Rights (chaired by R. Elliott, 2005), ALLEA has repeatedly brought these objections to the notice of the Commission and other bodies. We again ask attention for the following serious points of concern:

(1) Europe's existing 'patchwork' system of patenting is complicated, expensive and inefficient. We want to repeat the specific recommendations for a pan-European patent law that ALLEA's Standing Committee IPR recently formulated:

- The creation of a single uniform set of patent regulations for Europe, administrated by the European Patent Office (EPO);
- English as the one uniform language for patent applications;
- Community-wide jurisdiction to enforce patent law;
- The introduction of a grace period, in order to avoid disadvantaging European researchers vis-à-vis the US and the rest of the world;
- The separation of individual projects and medical treatments into separate or derivative registrations.

(2) New copying and dissemination technologies have opened a new chapter in scientific communication with more speed, better cross-referencing and often cost reduction. This is not much of a concern for most researchers and scientific authors, but is a very important issue for scientific publishers. Consequently, they are attempting to tighten copyright laws and to dilute the traditional 'fair use' exemption that allowed copies to be made for research and teaching. This could be disastrous for scientific communication and training.

(3) Legislative pressure to protect databases has led to a new European directive that will provide intellectual copyright protection for raw data, which is not covered by traditional copyright legislation. Denying access to such data could mean a serious impediment for science, since the quality of its products depends on the repetition and verification of the results by others. Moreover, such restrictive legislation could also apply to important public data sets, such as meteorological or oceanographic data, which used to be freely available to researchers. Both types of access restriction are a real threat to science.

(4) Enhanced protection for IP rights, particularly through international agreements, has a disproportionate effect on economically less-privile-

ged and developing countries, de facto denying them access to vital information and patented products.

(5) Finally, there is an important difference between discoveries and inventions, and patents should be issued only to the latter. In practice, however, this distinction is increasingly blurred, notably in the computer sciences and medical biology (human genomics). In the past, a patent submission had to meet clear requirements for invention, but at present even a vague, unsubstantial suggestion of potential medical application can lead to patents on a DNA sequence.

ALLEA and its member academies express the hope that the Commission will support them in their vigilance against further erosion of academic norms and against the efforts of publishers, the music industry and the media to tighten IP legislative frameworks to the detriment of the academic enterprise.

References

- Academia Europaea (2004). *Statement on the importance of the Humanities in the context of the European Research Area*. London: Academia Europaea.
- ALLEA (2004). *Excellence and equal access to the European Research Area*. Amsterdam: ALLEA/KNAW.
- Drenth, P.J.D. (2004). Regional scientific collaboration in Europe: Opportunities and challenges. In M. Durovic (Ed.), *The inter-academy Council for South East Europe* (pp. 17-30). Podgorica: Montenegrin Academy of Sciences and Arts.
- Elliott, R. (2005). Intellectual property rights and the scientific information chain. In P.J.D. Drenth & J.J.F. Schroots (Eds), *Critical topics in science and scholarship; ALLEA Biennial Yearbook 2004* (pp. 11 – 18). Amsterdam: ALLEA/KNAW.
- European Union Research Advisory Board (2004). *The structural funds and the research component*. EURAB 04.037-final.
- Gago, J.M. (2004). *Increasing human resources for science and technology in Europe*. EC Conference 'Europe needs more scientists'. Brussels, 2 April 2004.

- Kok, W. (Chair)(2004). *Mid-term evaluation of the Lisbon process*.
http://europa.eu.int/comm./councils/bx20041105/kok_report_en.pdf.
- Marimor, R. (Chair)(2004). *Evaluation of the effectiveness of the new instruments of Framework Programme VI*. Barcelona, 21 June 2004.
- Ormala, E. (Chair)(2005), *Five year assessment of the European Union Research Framework Programmes 1999-2003*. Brussels: EC, February 2005.

Representations and Activities ALLEA President and Office

- 12-1 Interview with science advisor Dutch Green Party. Amsterdam, The Netherlands.
- 17-1 Meeting with representatives EASAC, Nicholas Mann, and representatives of The Netherlands' Academy on relationship ALLEA-EASAC. Amsterdam, The Netherlands.
- 18/19-1 Visit Latvian President Vaira Vike-Freiberga: Attending address Mrs. Freiberga at the University of Leiden; Guest at dinner hosted by Her Majesty Queen Beatrix of the Netherlands; Hosting visit and discussion on European science developments at headquarters ALLEA/KNAW, Amsterdam, The Netherlands.
- 24/25-1 EASAC meeting, Royal Society of London, UK.
- 27/28-1 (with J.J.F.Schroots): Attending Conference on the role of national science-ethical committees in EU-member countries. Presentation on 'The role of ALLEA in science and ethics'.
- 6/9-2 Visit Cyprus; discussion on possible Cypriot National Academy of Sciences and Arts. Lecture on 'An Academy of Sciences and Humanities: where does it stand for?', University of Cyprus and Larcana Municipality, Cyprus.
- 15-2 Dinner hosted by Dutch Minister of Science and Education; closing the year of the Dutch Presidency. Wassenaar, The Netherlands.
- 24-2 Chairman of conference on European Accreditation of the new Bachelor-Master system in Higher education. Arnhem, The Netherlands.

- 22-2 Presentation ‘ Does scientific research have to be useful (as well)?’ Amsterdam Probus.
- 6/7-3 Ad Hoc UNESCO meeting of experts on ‘Code of conduct for scientists?’. Presentation on ALLEA’s point of view. Paris, France
- 16/18-3 (with Maarten Langemeijer): Joint workshop ALLEA Standing Committee on IPR and the International Association of STM publishers on ‘Open access publishing’. Hungarian Academy of Sciences, Budapest, Hungary
- 7/8-3 Meeting Council of ESF, Luxembourg.
- 14/15-4 Meeting Steering Committee ALLEA, Estonian Academy of Sciences, Tallinn, Estonia
- 25-4 Meeting with N. Schamp to finalise list of nominations for ERC, to be sent to Committee Patten
- 18-5 Meeting Standing Committee on Science and Ethics, Amsterdam, The Netherlands
- 19/20-5 ALLEA Conference 'Common Values in the European Research Area', Amsterdam, The Netherlands. Presentation on 'Autonomy and Independence: Concerns for an Academy of Sciences and Humanities'
- 21/22-5 STEPS-conference, Paris, France, on 'Improving Global Welfare and Security via Communications'. Presentation on 'Science Communication, a Vital Necessity'
- 29-5 Attending Executive Committee meeting of the European Materials Forum, Strasbourg, France (J.J.F. Schroots)

- 30-5 Discussion with President and Secretary *Hollandsche Maatschappij der Wetenschappen* on a possible European scientific prize, Amsterdam, The Netherlands
- 30-5 Attending Yearly General Assembly of the Royal Netherlands Academy of Sciences, change of Presidency (new President; F.P. van Oostrom), Amsterdam, The Netherlands
- 3/4-6 Conference Ministry of Science, Ministry of Health, Polish Academy of Science on 'The Responsible Conduct of Basic and Clinical Research', Warsaw, Poland. Presentation on 'Responsible Conduct in Science'
- 9/10-6 10th Baltic Conference on Intellectual Cooperation, Tallinn, Estonia. Presentation on 'Scientific Collaboration and the 7th Framework Programme: ALLEA's Point of View'
- 15-6 Publication of 'Investing in Knowledge in Europe'; ALLEA's reaction on the 7th Framework Programme proposals
- 20/21-6 Attending EASAC meeting, Vienna, Austria.
- 28-6 Reception Independence Day US Embassy and Farewell Party US Ambassador, The Hague, The Netherlands.
- 11/12-7 Attending meeting Competitiveness Council, Cardiff, UK. Presentation on 'Frontier research and the ERC: The Scientists' View'
- 14-7 Discussion with D. Farace, Director of GreyNet on Grey Literature and Current Research Information Systems (Maarten Langemeijer)

- 7/9-9 Visit Bulgarian Academy of Sciences, Sofia, Bulgaria. Presentation on 'Scientific Collaboration and the 7th Framework Programme: ALLEA's View', and discussion
- 7/9-9 Attending conference on European charter and code for researchers, London, UK (J.J.F. Schroots)
- 10/14-9 Participation Science, Technology and Society Forum, Kyoto, Japan.
- 19/21-9 NEST-conference, London, UK. Presentation on 'Investing in Knowledge in Europe: Taking up the FP7 Gauntlet'
- 22/23-9 Attending the meeting of the Council of the European Science Foundation, Berlin, Germany.
- 28/9 Representing ALLEA at reception of the Chinese Embassy, The Hague, The Netherlands, at the occasion of the 56th anniversary of the P.R. of China
- 6/8-10 Attending the meeting of the Senate and Biennial Assembly of the *Deutsche Akademie der Naturforscher 'Leopoldina'*, Halle, Germany.
- 11/13-10 Site visit (with J.J.F. Schroots) to the Academy of Sciences and Humanities of Bosnia and Herzegovina, Sarajevo
- 20/10 Attending / Representing ALLEA at the 25th Lustrum celebration Free University Amsterdam, Amsterdam, The Netherlands
- 27/28-10 Meeting Steering Committee ALLEA hosted by the *Accademia Nazionale dei Lincei*, Rome, Italy.
- 4-11 Meeting with delegation of Fundación Academia Europea de Yuste, KNAW, Amsterdam, The Netherlands.

- 7-11 Evening of Science, Ridderzaal, Den Haag, The Netherlands. Appointed as member Recommending Committee.
- 9/12-11 Participation World Science Forum 'Knowledge, ethics and responsibility', Hungarian Academy of Science, Budapest, Hungary. Presentation on 'Scientific integrity and social responsibility: the role of Academies of Sciences'.
- 15-11 Participation in discussion on 'Responsibility of science' introduced by Simon Schaffer and Steven Harpin. De Rode Hoed, Amsterdam, The Netherlands. Award Ceremony Erasmus Prize 2005 Simon Schaffer and Steven Shapin. Royal Palace, Den Haag, The Netherlands.
- 19/20-11 Participation Conference World Academy of Art and Science 'The future of knowledge: evolutionary challenges in the 21st century', Zagreb, Croatia. Presentation on 'Europe as a knowledge society'.
- 24/25-11 Meeting General Assembly, European Science Foundation, Strasbourg, France.
- 29-11 Presentation 'The dangers of pseudo-science', Probus meeting, Amsterdam. The Netherlands.
- 30-11/2-12 Participation ALLEA / SCSE workshop 'The ethical commitment of scientific and scholarly academies'. The Swiss Academy of Humanities and Social Sciences, Bern, Switzerland. Presentation on 'Scientific integrity and social responsibilities of Academies of Sciences and Humanities' (Drenth). Presentation on 'Are senior scholars an endangered species? On ageism, knowledge and the role of Academies of Sciences and Humanities' (Schroots).

- 6/9-12 Visit with the Georgian Academy of Sciences. Discussions with Academy members, and governmental officials on the role and position of the GAS. Presentation of an address 'The European research area: the role and mission of an academy of arts and sciences'. Tbilisi, Georgia.
- 12/13-12 Participation EC conference on the role and place of social sciences and humanities in the 7th Framework Programme, Brussels, Belgium.
- 13-12 Radio interview on 'Fraud in science', Hilversum, The Netherlands

Section III
ALLEA | All European Academies

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