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**PARLIAMENTARY OFFICE FOR
SCIENTIFIC AND TECHNOLOGICAL ASSESSMENT**

REPORT

on

Science, Society and Parliaments

(account of the meeting of committes and offices for scientific and technological assessment within the Parliaments of the European Union and the European Parliament – 22 September 2008)

Tabled with the Bureau of the National Assembly
by Mr Claude BIRRAUX,

President of the Office

Tabled with the Bureau of the Senate
by Mr Henri REVOL,

First vice-president of the Office

Composition of the Parliamentary Office for Scientific and Technological Assessment

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Mr Claude BiRRAUX

First vice-president

Mr Henri REVOL

Vice-présidents

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Mr Pierre LASBORDES, MP
Mr Jean-Yves LE DÉAUT, MP
Mr Jean-Claude ÉTIENNE, senator
Mr Pierre LAFFITTE, senator
Mr Claude SAUNIER, senator

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Mr Jean-Yves LE DÉAUT
Mr Michel LEJEUNE
Mr Claude LETEURTRE
Mrs Bérengère POLETTI
Mr Jean-Louis TOURAINE
Mr Jean-Sébastien VIALATTE

Senators

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Mrs Marie-Christine BLANDIN
Mrs Brigitte BOUT
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Mr Roland COURTEAU
Mr Jean-Claude ÉTIENNE
Mr Christian GAUDIN
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Mr Jean-François LE GRAND
Mrs Catherine PROCACCIA
Mr Daniel RAOUL
Mr Ivan RENAR
Mr Henri REVOL
Mr Claude SAUNIER
Mr Bruno SIDO
Mr Alain VASSELLE

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OPENING SPEECH

Mr Claude Birraux, MP, president of the Parliamentary Office for Scientific and Technological Assessment (OPECST)

Ladies and Gentlemen,

I wish, in my own name, and in that of Mr Henri Revol, senator, first vice-president of the Parliamentary Office for Scientific and Technological Assessment, OPECST, to thank the presidents of the National Assembly and the Senate for having included our meeting today on the very busy agenda of parliamentary events organised on the occasion of the French presidency of the European Union.

I'm very pleased to note that the topic of this meeting, based on the assessment work and forecasts undertaken at Parliaments in an essential field for the future of Europe, that of research, has given rise to such interest.

This mobilisation is a first response of hope given to European citizens who want greater consideration of their expectations as regards the decisions affecting their way of life and committing future generations. It's also a response of hope given to European Union researchers.

The involvement of Parliaments in assessing science and technology choices supposes the establishment of relations of confidence with the scientific community. The presence of presidents of academies of sciences, of technologies and of medicine, of members of the Scientific Council of OPECST, of academicians and of young researchers who have participated in the partnership set in place between the Office and the Académie des Sciences (Academy of Sciences), bears witness to this mutual recognition to which I'm very attached.

OPECST has indeed striven to develop relations between Parliament and the scientific community.

Defining the manner in which Parliaments can exercise their brief, at the interface of the world of research and society, also forms an essential democratic requirement to my mind.

To ensure its future our world must rise to major challenges of a climate, energy, food, and health nature requiring actions to be undertaken and solutions sought to avoid the worsening of tensions internationally. Such actions are therefore conducive to peace.

The mobilisation of all worldwide, and more particularly in Europe, is necessary to meet these challenges. This new challenge for research is added to those already clearly affirmed, of an academic, economic, technological or social nature.

To say that science and technology exercise a growing influence on societies, economies and our environment has become trite.

Everyone agrees in recognising that, while remarkable progress has been made, in terms of the living standard and economic performances, thanks to investment in research, the use of some techniques may also present risks of various types – health, environmental or ethical – which should be better understood.

The need to take into account the expectations of society has fortunately compelled recognition. These expectations are numerous and complex, sometimes contradictory. They are continually being added to by new concerns, among which a requirement for information upstream of decisions and marketing. Politicians, and also scientists, must answer these questions and integrate in their goals, not only scientific excellence and the transfer of technology to the economy, but also an explanatory effort with the public in mind.

How are our countries led to make enlightened choices? How can the confidence of European citizens be reestablished in science and technology? What role can Parliaments play? What means can they implement to be informed and contribute to societal debates? This meeting has the primary merit of allowing EU Parliaments as a whole to compare their experiences in this field.

The aim is not to impose a specific model, but rather to seek mutual enrichment from the practices of each of us, and examine the routes by which the legitimacy of parliamentary work can affirm itself, in a field long left to the sole appreciation of experts.

To date I have spent approximately half my parliamentary life in the majority and the other half in the opposition. When I was in the opposition, even if I didn't agree with what the majority of the time was doing, I knew that it had the legitimacy granted by an election. This must never be questioned. Otherwise, the very bases of democracy are at stake.

To answer the far-reaching objection of a democratic deficit, all the more unacceptable as it sullies long-term choices, many initiatives have been taken to favour public participation in decision-making. Our meeting should contribute to clarifying our role as parliamentarians, who must be fully involved in these debates.

I hope that, at the end of our meeting, a final declaration will express our support for research activities and innovation, our attachment to a strong involvement of Parliaments in this field, and our confidence in the future of humanity thanks to the progress of science and research.

ASSESSMENT OF SCIENTIFIC AND TECHNOLOGICAL CHOICES AND ROLE OF PARLIAMENTS

Mr Claude Birraux, OPECST president. A debate has started in the EU on the management of large research facilities. In this respect, the first speech this morning will be on how Parliaments take account of the scientific and technological aspects of public policies. It will be given by Mr Palinkas, president of the Hungarian Academy of Sciences, whose country has just joined the EU, He has conducted research particularly within the European Organization for Nuclear Research, CERN, which has just launched the Large Hadron Collider.

HOW DO PARLIAMENTS TAKE ACCOUNT OF THE SCIENTIFIC AND TECHNOLOGICAL ASPECTS OF PUBLIC POLICIES?

Mr Jozsef Palinkas, president of the Hungarian Academy of Sciences

Mr president, the organisation of this meeting, for which I thank you, shows that science and technology are fortunately one of the priorities of the French Presidency of the European Union.

A piece of good news to begin with: on 15 September, the Governing Board of the European Institute of Innovation and Technology – EIIT – decided, at its first meeting organised under the aegis of Mr Manuel Barroso, European Commission president, and of Mrs Valérie Pécresse, French minister for higher education and research, that its headquarters would be in Budapest. I thank each of you for having supported this decision.

A professor of nuclear physics at Debrecen University, minister for education in the early 2000s, I had to renounce my mandate as a parliamentarian in May 2008 after being elected president of the Academy of Sciences. It is therefore in this capacity that I am speaking, bearing in mind that the Hungarian Academy of Sciences has an important role to play in our country in assessing science and technology choices.

Several decisive Acts on research, innovation and development have already been voted: the 1994 Act related to the Hungarian Academy of Sciences; the 1995 Act on the protection of intellectual property law; the 2003 Act on research and technological innovation funds; the 2005 Act on higher education.

Referring to our institutions, the Hungarian Parliament, founded in 1848, is formed by the National Assembly, the Government being accountable to it. Parliamentarians are elected for four years and can hold three mandates. They vote in accordance with their consciences, bearing in mind that the real parliamentary work, based on political consensus between the various groups, takes place in the framework of committees, which are of two types: standing committees, on the one hand, on education and science, information technologies, European affairs, environmental

protection, culture and the media; temporary committees, on the other hand, in other words, committees of inquiry and ad hoc committees. Referring to the latter, I participate in the one created one and a half years ago, on research, development and innovation.

The twelve members, for instance of the committee of interest to us, can hear twenty experts, who have the possibility of presenting motions for debate or resolution, without of course having the right to vote. Similarly, these hearings can be held with the ministry of education, responsible for research and development. Sometimes, the Academy of Sciences is invited to present reports in this committee on the state of research and development in the country. Every year the committee drafts a report on science and technologies.

The committees are also in contact with the organisations of civil society, which can therefore inform them of their concerns. Despite all these efforts – I'm thinking in particular of our 'Open Days' programme –, the distance nevertheless appears great between civil society and parliamentarians, all the more so as the question arises of the competence of the many interest groups representing civil society which try to influence decision-making.

In this respect, we have an independent institution, the Hungarian Academy of Sciences, whose aim, in accordance with the law, is to provide enlightened advice to Parliament and the Government. Created in 1825 by Parliament, it is a public-law institution whose budget is decided by Parliament. Every two years, its president must present a report on the state of scientific research in Hungary to Parliament which is then asked to pass it.

Our Academy addresses all questions related to science and technology, nationally and internationally, within various disciplines – physics, chemistry, etc. It is a matter above all of major societal issues, for instance in the fields of energy, food, the environment, information and communication technologies, employment, health, education and safety. Our Academy is also, in the same way as public debate, a special partner in the preparation of the long-term strategy adopted by Parliament.

The Academy has its own committees bringing together the country's grey matter. Its members attract a large following nationally.

Yet is the impact of science and technology sufficiently taken into account in the elaboration of policies? This is a question which we cannot yet answer affirmatively. Many points remain to be improved. Admittedly, scientists can give their opinion through the committees, but it is Parliament as a whole which takes decisions.

By way of a conclusion, I will give you this answer by John von Neumann, the founding father of modern computing and game theory, to a question he was asked during the Cold War by a committee on science, technology and development, during a hearing in Washington, on the means of surviving technology development: 'We are unable to provide ready-made solutions for the challenges of the future. We can only define the human characteristics for survival. Namely: intelligence, tolerance, patience and flexibility. And a good sense of humour!'

I hope that intelligence, flexibility and humour will allow the European Parliament and the Parliaments of Europe to survive technological development, and also contribute to the development of sciences, technology and innovation. *(Applause).*

EUROPEAN CONSISTENCY IN TECHNOLOGY ASSESSMENT

Mr Philippe Busquin, MEP, chair of the Science and Technology Options Assessment Office (STOA) at the European Parliament

I wish, in my turn, to thank you, Mr president, for this meeting on an increasingly essential topic. In this respect, my speech will concern more specifically the need to build a European area for science and technology assessment.

Parliamentary technology assessment (PTA) has evolved in quite different ways in different countries where practices can diverge on account of traditions and structures. Therefore it is today necessary to strengthen its consistency for several reasons.

First, the evolution of PTA in Europe is a model of 'diversity in unity', in which differences of traditions, practices and institutional structures have not prevented the same aim from being pursued: better assessing the impact of sciences and technologies on society, and sharing their results with populations in a democratic manner.

Second, the Lisbon Treaty introduces a new dimension by strengthening at one and the same time the role of national Parliaments at European level and the co-decision process, all the more so as many fields are concerned, such as sciences, technologies, and science and technology assessment.

Third, the European Research Area (ERA) is being built little by little: the European Institute of Innovation and Technology, EIIT; European Research Council, ERC; and ERA-NET's action based, according to our European jargon, on the open coordination method. Similarly, ERA-NET must be set up for science and technology assessment. My successor at the European Commission, Mr Janez Potocnik, is also aware of this need.

The advent of PTA goes back to the creation by the US Congress in 1972 of the Office of Technology Assessment (OTA), which institution ceased activities in 1995. Since then, many countries have created Offices, but according to two structurally different models: on the one hand, the instrumental model, in which the Office serves as a consultancy to Parliaments alone, as in France, Germany, and the United Kingdom; on the other hand, the discursive model, in which the relation between science and society takes precedence, Parliament merely being an intermediary element, as in Switzerland and the Netherlands.

At European level, the European Parliament Science and Technology Options Assessment Office (STOA), of the instrumental model, was created twenty years ago. Its rules of procedure, amended in 2004, organise a pairing scheme allowing a special relationship between scientists behind a European project, and parliamentarians, generally of another nationality. Such a scheme existed in some national Parliaments –

in the United Kingdom with the Royal Society, and also in France – before being introduced at European level.

Bearing in mind each and everyone's experience, it is today necessary to see how consistency can be achieved in PTA practices.

In 2002-2003, a group of researchers – Belgians, British, Czechs, Danes, Dutch, Germans, Poles, Spaniards and Swiss – many of whom are here, undertook a project called TAMI – Technology Assessment-Methods and Impacts, whose results have been published in a book entitled 'Bridges between Science, Society and Policy'.

TAMI's aim was to check that the same things were being spoken of, an essential question at the level of Europe with its different languages. It was also to ensure that a transnational technology assessment concept could be created. Experts considered it was not only possible but primordial to reach this goal.

Similarly, researchers have answered the question 'Is it possible and opportune to adapt, transfer and use all technology assessment instruments at the transnational level?' that 'from the viewpoint of technology assessment practitioners, the answer is affirmative'. In effect, while the work by some Offices is of very great scientific quality, equivalent work is being conducted in other Offices. In addition, technology assessment methods and competences can be transferred thanks to an open coordination mechanism between professionals of the sector. Already, European programmes allow experts and researchers to travel to other countries with a Marie Curie grant. Why not create such grants in the assessment field?

Last, cultural differences can be overcome if methods and the subject of the debate are adapted from one country to another. While diversity creates creativity, it must not however become an obstacle to joint work. But, whether it is a matter of nuclear energy, GMOs, or stem cells, conceptions are different between respectively France and Germany, France and Spain, and Italy and the United Kingdom.

We have taken the initiative, in the field of nanotechnologies, to examine the means of facilitating relations between society and science on such an important subject. Europe has enormous potentialities, so society cannot lag behind in this respect.

To conclude on a slightly more personal note, I feel that European countries must integrate risk in the science and technology assessment field.

This risk can take three forms: the perceived risk – for instance the risk of being ill if you eat too much – which everyone can assume; the measurable risk – that in particular of having such or such a disease; and then the virtual risk, which stirs up emotional issues. In Europe, this risk is sometimes taken to an extreme. Science and technology assessments should, as far as possible, quantify such a risk and its probability.

There are many examples today where, for want of proportionality between risk and reality, irrational action is sometimes taken. Yet the precautionary principle, which Europeans are alone in the world in developing and which is a good thing in itself, must not in any case become a principle of inactivity. It lies with us, parliamentarians, to bring about dialogue between science and society. Europe will not be built if we are incapable

of developing joint methodologies to promote the most possibly harmonious relations between science and society, which supposes diversity and democratic choices. (*Applause.)*

TECHNOLOGY ASSESSMENT IN THE EXPERIENCE OF THE ITALIAN PARLIAMENT

Mr Silvano Moffa, MP, member of the Committee on Industrial Activities and of the VAST (Assessment Office) at the Italian Chamber of Deputies

Mr President, after thanking in your name the French presidency for having organised this meeting, I wish to give you the example of Italy and its practices.

The Italian Chamber of Deputies created, as early as 1997, as an 'offshoot' of the Bureau, a committee assessing science and technology choices (VAST), chaired by the speaker of the Chamber of Deputies.

The role of this committee is to coordinate parliamentary initiatives and activities in the field of scientific research and technological applications and contribute to the work of international and European bodies participating in particular in the EPTA (European parliamentary technology assessment) network. Its exclusively parliamentary nature means that it can fully play its role as a link between Parliament and the world of researchers, scientists, companies and institutions.

VAST organises thematic seminars and hearings on scientific topics central to the political debate owing to their economic, social, cultural and ethical consequences. It therefore sets afoot debates on space policy, nuclear power plants, the state of research in Italy, etc. It has developed constant dialogue with the parliamentary committees of the Chamber so that technology choices can be an integral part of parliamentary proceedings. This was the approach followed by the speaker of the Chamber during the last three legislatures when he chose to delegate coordination of the activities of the VAST to the chair of the industrial activities committee.

Parliaments must endeavour to find ways to allow politics to 'metabolise' technical data and underscore the potentials and alternatives offered by new technologies so as to make informed choices.

Parliament is indeed the natural place where an informed public debate can be held on the major issues related to new technologies. The acquisition of information and relations with experts are therefore becoming an essential strand of the decision-making process and it would be necessary to think about forms and mechanisms of parliamentary procedures that would institute the possibility, or even the obligation, for decision makers, to carry out complex assessments based on elements of a technological nature. At the same time, Parliament must be able to guide the technical knowledge acquisition process during legislative proceedings in order to fulfill its guidance and control brief. It cannot be reduced to being merely the passive recipient of knowledge from the scientific world.

From this point of view, the experience of recent years, within interparliamentary bodies, has not always been fruitful owing often to an organisation where technical data have appeared to prevail over the possibility, for parliamentarians, to play an active role in this field.

The capacity of Parliaments to interpret scientific data must, on the contrary, go beyond a simple technical vision. They must have a political and social vision of this data so as to fully seize the potentials of the choices made possible by technology.

Parliament must therefore have a role as an 'opener' in the field of the diffusion of technologies and the assessment of their economic, social and political impact.

In scientific circles, as in the media, the potentials and possible applications of new technologies have often been highlighted. But the incapability of decision makers to seize these opportunities has also often been deplored. It is well known that the impact of new technologies on daily life has been less important than could have been expected. That's why, in Lisbon, the accent was placed on the need to develop more the Europe of knowledge, as an essential parameter of the economic and social growth of European citizens.

I wish to draw attention to a parliamentary work method problem regarding the assessment of science and technology choices. It would be necessary, at national level and in interparliamentary bodies, to make parliamentary decision-making processes more permeable to technological elements, and see to it that MPs can play a more important role. It must be acknowledged that EPTA has not formed an effective forum of exchanges and discussions between European parliamentarians involved in technology assessment. The very role exercised by parliamentarians in this body has not always been adequate, which has hindered the creation of efficient interparliamentary relations in the scientific data field. That's why today's meeting is important.

When choosing the topics of and the sequences of the EPTA annual conference it would be necessary to propose the direct involvement of the speakers' offices of European Parliaments and of MPs belonging to various assessment committees.

Also, to exercise political influence, interparliamentary bodies should be able to approve documents of a political nature at the conclusion of work. These resolutions could, as underscored by the previous speaker, form a useful basis for studies which would then be conducted by each Parliament on specific topics. It would also be necessary to ensure greater information on legislative initiatives pursued by each Parliament in the technology assessment field following analysis at the interparliamentary level or following specific initiatives at the national level. *(Applause.)*

Mr Claude Birraux, president. The experience of the French parliamentary Office is interesting in this respect . Its composition – it comprises eighteen MPs and eighteen senators from the majority and the opposition, from both houses whose traditions and ways of operating are different – does not prevent its members from working in perfect harmony. Assisted by a Scientific Council with twenty-four members, we can call on a working group or a 'steering committee' composed of personalities from outside Parliament, for each of the studies conducted under the authority of a rapporteur.

In addition, we do not content ourselves with holding hearings in our country. We travel abroad to examine good practices and the way in which such or such a topic is addressed, to draw the best of each of these experiences.

STATEMENTS

Mr Janis Strazdins, MP, chair of the Education, Culture and Science Committee at the Latvian Diet

In 2003, the Education, Culture and Science Committee of the Latvian Parliament created under its aegis a sub-committee for the development of Latvia in the years ahead, in order to monitor the implementation of the Lisbon strategy. This sub-committee assesses development and innovation in advanced technologies, and encourages businessmen to establish contacts with and cooperate more actively with scientists and researchers. This way, MPs meet university researchers and scientists, high officials, NGO representatives, members of the Academy of Sciences and scientific associations. This cooperation has led to the adoption of a bill laying down that the funding of scientific activities will increase every year by 0.15% of GDP.

In 2005, Parliament adopted a substantial document on the long-term development of Latvia entitled 'A growth model for Latvia: people first', which has become the basis of our country's national development plan for the period 2007-2013. This has been debated in specific forums and is now moreover consultable on the Internet.

In 2006, the Government approved the scientific research priorities for the period 2006-2009. A long-term funding programme for education and scientific research has also been prepared on the basis of the national budget, completed with European Union funds. This programme provides for a significant increase in public investment in the development of science and technologies. Beyond this period, Latvia is working on a sustainable development strategy until 2030.

Mr Virginijus Domarkas, MP, chair of the Education, Sciences and Culture Committee at the Lithuanian Diet

Faced with the geopolitical and economic challenges of recent years, the European Union has adopted the Lisbon strategy aimed in particular at ensuring sustainable European economic growth by means of global and interdependent reforms, the action undertaken by a given country being all the more effective when the other Member States act in concert.

Our economic strategy in Lithuania is to strengthen growth in order to reduce the gap between the economic development of our country and that of the average of EU countries as a whole. Such a goal requires a shrewd scientific development policy and a competitive economic policy thanks to knowledge of and development of human resources.

In 2000, the European Union invited all the Member States to set up a joint European research area so as to be able to implement the Lisbon strategy. Unfortunately, no matter how good strategies may be, they are sometimes concretised with difficulty; not everything that is planned is always implemented.

Since the reestablishment of the independence of our country, very few investments have been made here to renovate and develop the infrastructures of scientific establishments and universities. Yet our fundamental and applied research, which has kept a high potential, has continued to advance, to our greatest satisfaction. Thanks to European funds, various university and economic programmes have been started, and national excellence and competence poles are being set in place at the same time as accent is being placed on developing human resources and improving the career of researchers.

The fact that politicians are prepared to recognise the insufficiencies of their action strategy and reflect on the means of improving it, is, in this respect, an opportunity in Lithuania. The various parties represented in Parliament have moreover signed an agreement on the restructuring of the Lithuanian scientific and university system, evidence that, faced with major challenges, political opponents can overcome their divisions and agree to the benefit of their country.

One of the problems is to improve the management, control and supervision of scientific and university bodies, and increase their responsibilities – they are accountable to society – and also to create the legal conditions allowing fundings to be used to best avail. Various programmes have been launched, as well as interdisciplinary scientific research, the aim of which is to encourage world-class Lithuanian researchers to remain in Lithuania by offering them real career prospects, in short avoid a brain drain. Reform is under way. We have realised that apart from firm political determination, broad social dialogue is also necessary. Parliamentarians really must have a mandate to act resolutely in this direction.

Education, scientific research and social development form the three strands of the knowledge and innovation society thanks to which the European educational system will remain attractive worldwide. Lithuania is confident it will advance along these lines, with a competitive knowledge-based economy ensuring a high standard of living and harmonious social development.

Mr Piotr Wach, senator, member of the Science, Education and Sport Committee at the Polish Senate

I wish above all to thank the French Parliament for having organised this meeting, and even if it is no doubt premature to do so, I would like to express my support for the draft final declaration, admittedly very general, but fundamental. Perhaps it is simply lacking a reference to education in sciences and technology.

We are meeting, I believe everywhere in France and in any case in Poland, difficulties in this field. We lack good level students, especially in mathematics and, generally speaking, in scientific and technological disciplines, and the number of those choosing these courses is unfortunately decreasing. A special effort would therefore be

necessary in this respect. Of course, the remuneration of jobs, for example, of engineers, to which these studies lead is an important element of attraction, but it is also necessary for scientific studies to be attractive from the outset for young students. Parliaments should insist on this issue of education in sciences and technologies, and our final declaration should mention this.

Lastly, I wish to address the issue of energy and nuclear power plants, which must not be taboo. Why not debate the conditions under which nuclear power could be considered a clean power compared with fossil energies? France has very great experience in this field, most of its production of electricity being nuclear. Poland does not have any nuclear power plants yet, but would like to be able to base itself on the experience of other countries. That of France could be precious to us, especially concerning technological aspects. Should we, for instance, seek to develop breeder reacters or new types of reactors?

Mr Claude Birraux, president. We will not start the debate on this point to-day and even less will we settle it. But if the Polish Parliament wishes to organise a debate, members of our OPECST, who have more specifically worked on these matters, can participate in it.

Mr Philippe Galiay, senior administrator at the European Commission Research Directorate-General

I will be brief as the Commission shares most of the points developed by Mr Busquin. For the Commission, the European Research Area is a common framework for discussion and action. Only since 2002, the date of its launching, has the question of the relation between science and society been for the first time formally posed in a framework programme.

With this in mind, we have examined the matters related to the governance of science, paying special attention to three work strands: participation in science of citizens and civil society organisations; knowledge of risks and their assessment; and, last, the communication of scientific opinions to politicians. It is this last strand which has been the least lively to date. Carrying out comparative studies, we realised that there were myriad bodies communicating scientific opinions. We tried to coordinate them, data processing instruments forming a precious aid in this respect. And, recently, we have launched with the European Parliament pilot exercises to establish links between scientists and parliamentarians. We are in the process of assessing the results of these exercises.

What should be done so that the European Research Area, today highly fragmented, becomes more integrated and therefore more effective? We have already mobilised some networks through the few actions we have taken, like the network of technology assessment bureaux at Parliaments or else the network of academies of sciences. But it is no doubt possible to be far more ambitious and efficient in the future.

Mr Irinel Popescu, senator, chair of the Education, Science, Youth and Sport Committee at the Romanian Senate

A law is being prepared in Romania to create a Science and Technology Assessment Office and, in this respect, I wish to particularly thank Mrs Ulla Burchardt, chair of the Committee on Education, Research and Technology Assessment at the Bundestag, who gave us many ideas at the Berlin meeting in 2006, as well as Mr David Cope who also greatly enlightened us during his visit to Romania, and Mr Henri Revol, chair of the Franco-Romanian parliamentary amity group and vice-president of the French OPECST.

I feel that Parliaments are the most relevant place to debate the assessment of technologies, if only because of the diversity of opinions which can be expressed there. They must not however be places only of debate but also of decision. They must give clear and precise opinions, inform the population of the potential risks of new technologies and take the necessary decisions to protect people.

Technologies are enjoying a boom in Europe and the goal to compete with the United States and even outdo it regarding science and technology, which previously appeared almost impossible, is beginning to become realistic. Europe can reasonably aim for the first place worldwide in the science and technology field. Parliaments must therefore pay the greatest attention to assessing new technologies and their impact on the population and on development.

The Science and Technology Assessment Office, which Romania is setting up, will have to be assigned the necessary fundings, for want of which no quality activity would be possible. For the moment we have a body composed of members of the Senate and of the Romanian Academy, and I totally share the opinion of the president of the Hungarian Academy of Sciences: countries which have academies must use them, all the more so as the members, appointed for life, of these steadfast and prestigious institutions, are very happy to participate in this work. The law being prepared sets forth that the new Office will also comprise MPs and perhaps members of the Academy of Sciences. We are opting for the production of reports drafted by parliamentarians and including a political opinion, rather than purely scientific reports drafted by scientists who would make them available to politicians.

We are progressing in the setting in place of this Office. The road will not be easy, but we have already learnt a great deal, and will continue to do so, from the experience of each of the other European countries. En route, a meeting like this one is very useful to us.

Mr Ferdinand Devinsky, MP, chair of the Education, Youth, Sciences and Sports Committee at the Slovakian National Council

The role of universities and of the private sector, for the MP and academic I am, must not be neglected, above all with a view to a participative model. The higher education sector indeed has an enormous potential as regards research, whereas the private sector should contribute financially to supporting research. The question is

therefore to know how universities and the private sector, and not only academies of sciences, can influence the parliamentary decision-making process. Transparency and also better integration are at stake.

Today there is no structure in Slovakia of the OPECST type, but we should be able to put one in place rapidly. On this point, your experience should be very precious to us.

Mr Petre Popeangä, MP, chair of the Committee for Education, Science, Youth and Sport at the Romanian Chamber of Deputies

The public policies field is a border area with many so called 'classic' disciplines such as political science, sociology, psychology, juridical science or economics. Some researchers in this area say that public policies represent the most recent field in politics.

Since the 1960s, interest about what happens inside the Government has developed. People are preoccupied with the efficiency and the development of public funds and are interested in studying how political-administrative decisions are taken. Since the 1980s, governance has been approached in terms of reform with emphasis on the manner in which public funds are administered, improving the relationship between State and citizens, between Government and civil society. Generally speaking, public policies represent the actions of the Government toward society's problems. We are talking about public policies when a public, central or local authority tries to modify the economic, social or cultural medium through a coordinated action plan. Using public policies, the State interferes in economic and social activity, modifying reality in a certain expected direction, which is considered favourable. The reasons for this intervention are multiple, for example trying to correct the action of the public market and promote social values.

But not the whole of society is involved equally in the decision-making process. Inside the country, public policies can be made by any of the public institutions: Parliament, Presidency, and Government – central or local. Public policies are made by all those involved in public programmes, ministries, committees, decentralised agencies, trade unions, NGOs, pressure groups.

The executive is the keystone of the public policies system. Its role results from the authority conferred by the Constitution to administer the country. The executive therefore has many means to strengthen its position, such as total control over information, control over fiscal resources, preferential access to mass media, and an entire specialised bureaucratic system allowing it to control and influence some of society's 'players'. The executive often controls legislative priorities and how laws are adopted.

In parliamentary political systems, the role of Parliament is to supervise the actions of the Government and this allows it to influence politics. As long as the Government has a parliamentary majority, it can be rarely controlled. In presidential systems, although the executive has to convince the legislative assembly to approve its measures, there is always a large action area that the Government cannot control.

The budget is one of the most effective control instruments of the Government and even if the executive has a parliamentary majority it no longer has a binding influence.

The role of speciality expertise is growing because of the evolution of public administration and on account of the importance of the Government's alternatives (sic). An important part of this expertise is accounted for by the civil servants.

The necessity of developing the elaboration of a public policies system is also highlighted in the European Union. The Lisbon Strategy, set up by the European Council in March 2000, aims to make the EU 'the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment by 2010'. In order to reach this objective, EU States have to be capable of utilising the budget and public policies planning, including public policies impact analysis and improving the participation of civil society in elaborating public policies.

These developing directions are followed by new actions of the Government and its institutions, in order to facilitate the transition from technically understanding the legislative process to a thoroughgoing study – the analysis of public policies – and to allow the development of a system which elaborates public policies as a main instrument that has to improve, ground (sic) and promote the quality of the decisional process in the social and economically complex medium of modern society.

In order to achieve this, in addition to a good cooperation between the political and executive levels, it is also necessary to develop the knowledge and aptitudes of all the people involved in the process of establishing public policies.

Recently, Romania has made important progress in the public policies system, which has helped the Government to better see its own political priorities and give better information to Parliament. The reform process in this field has seen the establishment of a Public Policies Unit within the General Secretariat of the Government, a Strategic Planning Council and public policies units inside the ministries, and all the Secretaries of State have had weekly meetings in order to prepare the Government sessions. Proposals and bills have been adopted to approve the rules on formulating procedures, monitoring and evaluating public policies at central level. Ministries have to formulate public policies proposals in a specific format for all important juridical documents before they elaborate them. In order to apply this regulation, the Public Policies Unit within the General Secretariat of the Government has drawn up a Handbook to assist the ministries.

The efficiency of public policies depends on how the activities of coordination and consultation are developed within the public administration institutions and between them and civil society, represented by NGOs, research institutions and others.

However, to accomplish this aim it is necessary for each public policies project to be sustained by an impact analysis in order to evaluate the economic, social, cultural and even ecological effects that may appear.

DEBATE

Mr Claude Birraux, president. Our discussions underscore the absolute need for Parliaments to be informed of scientific issues and organise the interface with the scientific community. In this respect, several models exist: the Hungarian model, where academies of sciences play a major role; the French model, where parliamentarians liaise with the scientific community, but conduct studies themselves and shoulder responsibility for them; and the European Parliament STOA model which endeavours to reconcile debate, expertise and a greater involvement of Parliaments.

We must be very vigilant. Fundamentalism in effect arises from a closed situation which often results from incomprehension: when you don't understand what's going on around you, you tend to retreat into a kind of cocoon and reject everything outside. What you don't know, because you've never seen it, also tends to dazzle – who doesn't know the legend of Plato's cave?

Admittedly, some of the present technologies are not easily explicable to all, which may pave the way for possible preachers of non-science or even obscurantism. It is our role as parliamentarians to ensure we organise the interface with the scientific community and understand, ourselves, a minimum of the ongoing evolutions.

This afternoon, two speeches will relate to bioethics and address in particular the issue of gestational surrogacy. Apart from the fact that this practice is not authorised in France, and that those wishing to benefit it from are obliged to travel abroad, the most essential question that arises in this respect is whether, after a given age, it is ethically acceptable for a woman to have children thanks to MAP techniques. Everyone knows that this point goes beyond the realm of science; we are in the field of philosophy and ethics.

Mr Jozsef Palinkas, president. I agree with our Slovakian colleague about the need to bring academics into the decision-making process.

In Hungary, the Academy, a prestigious body guaranteeing the scientific quality of work, includes academics, at least the best of them, and nearly 70% of its members also work in university. For instance, at a meeting to which I had invited twenty experts, twelve came from university. Our problem in Hungary is that for ten million inhabitants, we have seventy-two universities, which is a lot. One of the first requirements is to assess these establishments.

Mr Lars Hjmälmered, *MP, member of RIFO, member of the Committee on Education at the Swedish Parliament*. I welcome this type of meeting providing insight into the experiences of other countries and allowing lessons to be learnt.

In Sweden, we are meeting the same problems as those set out by our Polish colleague. In this respect, two interesting initiatives have been taken in our country. First, a body has been set in place in Parliament to establish links between parliamentarians and renowned scientists so that politicians can stay abreast of the latest results of research. Second, there is an ongoing debate to create a kind of research board to the Government in order to strengthen its assessment capacity and enlighten its

decisions on research for the future. Proposals should be submitted to us within a few weeks.

Our neighbour, Finland, has taken a very interesting measure by creating a standing committee on the future of strategic programmes. The setting in place of the European Research Area and regular meetings of the European Research Council also appear to us to be excellent initiatives which we support. Nevertheless, we feel that the European Union is over spending on present affairs, for example on the CAP, to the detriment of the future, whereas it would be better to invest in research programmes with prospects.

Mrs Ulla Burchardt, *MP, chair of the Committee on Education, Research and Technology Assessment at the German Bundestag*. I wish to thank our French colleagues who took the initiative for this very interesting meeting, and also our Romanian colleague for the very friendly remarks he made in my respect.

I chair at the Bundestag the Committee on Education, Research and Technology Assessment. It is one and the same committee tasked with all these issues – I emphasise this because in the various Parliaments, the same points are not necessarily accentuated: whereas some insist on research, innovation, and technologies of the future, others favour assessment.

The Lisbon strategy aims at making the European Union a competitive area of economic growth, but it must also contribute to improving the quality of life and social cohesion. Urgent solutions are necessary in a whole series of fields such as health, climate change, and the ageing of the population. We need global solutions, and cannot content ourselves in these fields with only technical or technological solutions.

A clear distinction must be made between the original task of Parliaments, which is to legislate, and the new brief consisting for instance in giving opinions on scientific topics. I thank our Romanian colleague for having recalled that the primary task of a Parliament is to elaborate laws and take the essential decisions to ensure the safety of the population. Despite the need to communicate more broadly and have all the necessary expertises which can be obtained from scientists, let's never forget our primary task. We should remain aware that even us parliamentarians have only twenty-four hours a day.

As for the nuclear field, a classical field of the assessment of technological impact in Germany, we could no doubt organise a specific meeting on this subject which would provide an opportunity to compare the experiences of all the Member States. A short while ago I attended a hearing of our environment committee on the issue of the disposal of radioactive wastes for which there is not yet a satisfactory solution. However, in the very interest of future generations, common sense would dictate not pursuing a production whose wastes we don't know what to do with. Processing radioactive wastes is moreover very costly for the taxpayer.

As can be seen, the issue is not only scientific or economic, but also ecological. It is a global matter to be addressed globally.

Mr Claude Birraux, president. Another issue is knowing what to do with the carbon dioxide produced by thermal power plants. We can organise another meeting to specifically debate these subjects.

Mr Jan Staman, *director of the Rathenau Instituut (Netherlands).* In the Netherlands we are conducting entirely innovatory, major research programmes on life sciences, nanotechnologies, etc., to which we are devoting considerable means. As soon as funds are assigned, a given amount is earmarked for the assessment of the impact of these technologies. But experience has taught me that the relations between parliamentarians and scientists are not always easy. It's as though the latter fear the former. They therefore balk at making precise statements on their work and at speaking on their political dimension.

It is therefore not enough for parliamentarians to debate with scientists. Their confidence must be gained so that they're more attentive to our needs when we draft our reports on their work.

Mr Pierre Braunstein, *member of the Academy of Sciences (France).* The assessment of science and technology choices supposes, generally speaking, having relevant assessment instruments. Foreign parliamentarians have expressed their concern about assessing the competences of universities, institutes and other research bodies. The same applies at European level. How are we doing referring to the pooling of instruments allowing the best practices to be validated and allowing, internationally, Europe to be able to self-assess itself to make progress and also to assess others instead of waiting for classifications made by others to be applied to it as they are often lacking in relevance. How is European ambition faring on this point?

Mr Claude Birraux, president. Researchers, whom I often meet, tell me that when they have to coordinate a European programme, they no longer engage in research but administration. A simplification would no doubt be necessary.

Mr Philippe Busquin. The question of the simplification of European programmes arises recurrently and is not easy to settle, above all with twenty-seven members.

That's why very flexible approaches are to be favoured like ERA-NET, which allows the mutual opening of national programmes. But, to my knowledge, there is no ERA-NET on assessment. The European Commission would however have the means to fund such a structure thanks to the Science and society programme, which has been significantly fed within the framework of the 7th framework programme – 360 million euros can be set aside for it today.

The networking and sharing of information are extremely important to determine best practices. Europe cannot – nor does it want to – impose practices. It can merely encourage those which appear the best and disseminate them so that countries that still do not have assessment bodies can have references.

The more general issue of the assessment of universities and of classifications, like the Shanghai classification, is crucial. This issue is being looked into. It is a pity that Europe depends on the rest of the world for its science and technology assessment, all

the classifications being made today in the United States or China. Europe must assert its own criteria, its own values and its specific knowhow. Let's not be obsessed with the Shanghai classification!

An excellent study made by the chief education officer of a Belgian university has highlighted the lack of consistency of the Shanghai classification and has shown that the criteria adopted end up favouring a given type of university. However, all politicians today want the universities of their country to progress in this classification and quite artificial groupings of establishments are even sometimes made for the sole purpose of rising in the classification. European knowhow is recognised, but the recurrent problem in Europe is that it is too dispersed. It would be interesting to set up a working group on the subject.

Mrs Annie Sugier, *director at the Institute for Radioprotection and Nucelar Safety (IRSN), member of the Scientific Council of OPECST (France).* I wish to return to what Mr Palinkas said about competence. To take decisions in an enlightened manner, we must succeed in bringing to the fore relevant controversies. Unfortunately, these controversies are often expressed more in the media than in parliamentary debates. From this viewpoint, it would be necessary to think about the means of developing the competences of non-governmental organisations, whose positions can sometimes be perceived as irrational whereas they result merely from a lack of competence. The debate would be enriched in the process.

THE FUTURE OF THE EUROPEAN SPACE POLICY

Mr Henri Revol, senator, first vice-president of OPECST

I'll illustrate today's topic by taking the example of space research. I will structure my speech around an unusual concept for the space sector, the 'renewable resource'.

There is a renewable resource which is crucial to the entire approach of our societies to the conquest of space: public interest. This departure point of analysis may appear paradoxical, since populations appear to be definitively enthralled with the conquest of space. The sky has been the stuff of dreams since Antiquity: before the films of Georges Méliès and Fritz Lang, before the novels of Jules Verne and of Wells, Lucien of Samasota, in AD 200, already imagined a voyage to the Moon. Space research is therefore based undeniably on a historic passion of populations. How otherwise can it be explained that so many people stayed up late in the night of 20 to 21 July 1969 to watch Neil Armstrong on television walking on the Moon?

But there is another reality of the conquest of space: oblivion and disinterest into which space launchings sink after great events like the success of Apollo 11 or, for us Europeans, missions during which one or another of our astronauts accomplished a feat – like Mrs Claude Haigneré present among us this morning, who made us marvel us when she was in space. Such is the 'renewable' interest of our populations for space: it is intermittent, capricious and fickle.

However, an enterprise as strategic as the conquest of space cannot be built on such fickle interest. This enterprise indeed supposes very great investments and must be a long-term matter. The role of Parliaments is precisely to provide the conquest of space with the guarantees of institutional stability it needs. Parliamentary offices for science assessment have in this respect an essential enlightening and guiding role in helping it steer a steady course.

In the United States, once the worsening of the budgetary abyss of the Moon programme – the equivalent of 135 billion present-day dollars – was stopped, Congress maintained funding for NASA, allowing it to start a programme of sending robots to Mars and the planets of the solar system, and to develop the space shuttles industry.

In Europe, the role of a reasonable but determined promoter played by Parliament in the space field has been supported by the European Space Agency, ESA, funded by State appropriations. Thanks to constant and confident political support from national elected representatives in the dark days when discouragement could win the day, the European space adventure has proved to be an immense success today with Ariane. Without even insisting on the success of the progressive development of this launcher, ESA has achieved remarkable successes: the Giotto probe, launched to intercept the famous Halley's comet, approached the core of the comet to within 600 kilometres; in 2005, Huygens was the first automatic vehicle to land on Titan, Saturn's largest satellite.

ESA has seventeen member countries and several partner countries. But, in 1972, it took the steadfastness and confidence of the Parliaments of the ten founding countries to believe in the space Europe, after all the previously accumulated deceptions. Faced with the changing moods of society, it took all the stabilising force of representative democracy to defend the idea that the bread and water period, that of the slow learning of a complex and demanding technological field, would finally lead to a foremost position in the conquest of space.

This constant and confident, albeit reasonable, budgetary support, still remains equally essential.This is evidenced by the determination it took, in November 2007, after five years of difficult negotiations, to reach an agreement on the funding of Galileo, which will ensure Europe's independence with respect to geolocation instruments from 2012 on.

There is another field where Parliament can find another classical role alongside its budgetary task: regulating the use of space. This takes on two forms: a quite old form, authorising the ratification of international agreements, which could develop rapidly with the need to integrate new concerns of the global society; and a more innovatory form, setting in place national regulations for the private use of space by companies.

This new dimension of international regulation appeared in 1993 with the coordination of the follow-up of what could be called 'space pollution' that has resulted from the launching into space of nearly 5000 objects since the first Spoutnik. With the stages of abandoned launchers, pieces torn off heat shields, various accidental losses on missions and the debris from explosions, more than 330 million artificial objects are believed to be navigating in Earth orbit, creating a danger in the event of a collision. The

first of the kind, identified as such, dates back to 1996 and led to the stabilisation arm being severed from a French military satellite.

Another field of regulation has appeared following the mastery of space technology that has allowed the development of private activity in space – the launching of satellites delivering television, Internet, and mobile telephony – or even soon the provision of a space tourism service. States no longer have a monopoly over the conquest of space, which will consequently require legislative framing to guarantee the safety of flights and compliance with international agreements.

The completion of the Apollo moon-landing programme, in 1972, was accompanied, on the part of the American administration, by a change in the conception of the place of the private sector in astronautics: until then a mere builder of space craft on behalf of NASA, the private sector afterwards took over in the exploitation of satellites themselves.

Since then, the privatisation of space has not ceased to expand, going as far as taking the form of consortiums supporting vast space mobile telephony projects covering the entire planet, like GlobalStar and Iridium – comprising respectively forty and sixty-six satellites. This privatisation of space has led to the setting in place of a regulatory regime by States. In France, mention can be made of the Act of 21 June 2004 on confidence in the digital economy – whose title IV addresses 'satellite systems' – or, more recently, the Act of 3 June 2008 on space operations, for which moreover I had the honour of being the rapporteur before the Senate.

I hope that you are now convinced, like me, that Parliament has played and will continue to play an essential mediatory role between, on the one hand, society, whose interest for the conquest of space is 'renewable', in other words subject to squally periods followed by doldrums, and which can end up worrying about everything that has been accumulating in Earth orbits since 1957 and, on the other hand, the players of the conquest of space, to whom regular but framed funding must be guaranteed.

Mr Claude Birraux, president. This example is a perfect illustration of how much Parliaments must be familiarised with scientific issues in order to legislate.

EVOLUTION OF THE MICRO AND NANOTECHNOLOGIES SECTOR

Mr Claude Saunier, senator, vice-president of OPECST

After trekking among the stars and having mentioned edifying ideas like the cave legend, I invite you to return to Earth with the report on microelectronics and nanotechnologies which OPECST asked me to write.

This report takes on technical, scientific, economic and societal dimensions. It illustrates the work accomplished by a Parliament which is asking itself major questions, is seeking to better understand what is happening in the field of science and is assessing the consequences likely to result in the economic and societal fields.

This report, like all those by OPECST, results from an inquiry that lasted nearly a year, during which we organised between 200 and 250 hearings, in France, Europe and the rest of the world. This effort would therefore deserve to be better known and better shared – in this respect I share Philippe Busquin's remarks.

A few decades ago we entered a new phase of the history of humanity: the digital society. Each and everyone of us consumes thousands, millions, and billions of transistors and calculation and information capacities, resulting from the technological revolution that took place in the 1970s with the invention of microelectronics, a major industry today, but, when all is said and done, poorly known by parliamentarians and the general public.

First, its turnover, globally, amounts to some 300 billion dollars, but the activities and services depending on it represent 10% of the world economy. In recent years, the growth of this industry has even been two to three times higher than the average growth of the world economy, of which it is one of the drivers.

Second, it is an economic and industrial sector in the full swing of change. The production cost of microprocessors is higher and higher, and tomorrow a plant will cost 6 billion dollars as against 3 billion today. A single lithography machine is as expensive as three Airbuses and a foundry has three, four or even ten machines of this type. It is therefore a highly capital-intensive industry.

Third, this industry must adapt at an extremely rapid rhythm. The content of our mobile phones and other machines has a six month lifespan: every half year, this industry must invent new concepts, and new products to meet demand. Everyone has heard about Moore's law: the calculating power of chips doubles every eighteen months. It's as though the driving power of 19th century steam machines, behind the first industrial revolution, had doubled every eighteen months. And these chips no longer just calculate: they now know how to measure and transmit.

For how long will this progress continue? The present technological model, based on silicium, has an expected lifespan of some ten to fifteen years. Beyond, even if we don't have the scientific and technological answers, possibilities of evolution will be offered by quantum electronics and spin electronics – Albert Fert's discoveries multiply the memorising capacities of the machines of our environment.

The new fact is that the future of this industrial sector now results from its capacity to meet societal challenges. The fabulous prospects of microelectronics can indeed help us to answer major questions of society regarding energy savings, road safety, and also health improvement.

However the massification of microelectronics products raises unescapable environmental problems. No less than 13% of the world consumption of electricity is due to the use of objects integrating microelectronics, and a quarter of this 13% can be ascribed to inactive objects, in standby mode. The electricity consumption of Google's servers corresponds for instance to that of a city of 50,000 inhabitants. The price of keeping information in a large data bank costs more in electricity consumption than in purchasing the server. What's more, every year we produce sixteen kilos of

microelectronic wastes. The environmental impact of new technologies cannot therefore be ignored.

The multiplication of information, especially RFID – radio frequency identification – information, raises genuine ethical and therefore political issues concerning our private life and the capacity of authorities and major industrial groups to invade it.

These crucial questions must be addressed by our Parliaments.

I don't wish to be frightening by brandishing the yellow peril, but 70% of the consumption of microprocessors is concentrated in South-East Asia and Japan. The phenomenon has grown in thirty years or so on the back of political voluntarism supported by strategic choices, tax initiatives and a commitment of major research and training centres in favour of new technologies. America has not been outdone: it produces only 17% of microelectronics but still controls indirectly nearly half of world production. Its weight is even greater if microelectronics-related services are counted, with Microsoft, Google and the other giants.

In this context, what is the future of European microelectronics? Europe has world-level assets, especially very large research centres, and also global industrial leaders. But it suffers from a lack of clarity regarding research and the industrial policy. Admittedly there are many European programmes which have allowed Europe to score points, but it controls only 14% of world production. In this respect, the issue of industrial delocalisations will determine a major part of the future of the electronics industry and also of the car industry where 35% of the value of a mid-range vehicle is made up of electronic products.

The report I have just presented to you, far from being theoretical, leads to political proposals directed as a matter of priority at French but also European leaders. The relevance of the Lisbon strategy is being affirmed day after day, but remains conceptual: we devote not even 3% of GDP to research. The challenge consists in relaunching a strong industrial policy and seeing to it that our fellow citizens become reconciled with Europe and rebuild it on the basis of concrete dossiers combining science, technology, economy and societal challenges. It is in this direction that the debate must be widened in our Offices.

DEBATE

Mr Philippe Busquin. These remarks are worth being relayed in all our national Parliaments as well as in the European Parliament where we are organising workshops on these subjects. Such a report should be translated into the Union's national languages so that national Parliaments can refer to it. When I was a European commissioner, we funded translations of exhibitions, in particular an excellent Portuguese exhibition on mathematics, which could therefore circulate throughout Europe.

Mr Claude Birraux, president. We have somewhat got ahead of your desire since these two excellent reports have been translated into English. In addition,

summaries in French and English are systematically published – there is even one in Spanish on the report on the topic of biodiversity.

I wish to thank again our two colleagues for these two remarkable speeches on transversal topics likely to interest all our Parliaments.

Mrs Annie Sugier. Following these two, indeed, high quality speeches I am wondering about the distinction to be made between what Mr Revol called 'reasonable promotion' and assessment? Are these two strands complementary or contradictory? What action must the Office take in this respect?

Mr Henri Revol. Everything depends on budgetary resources, in other words the power relations between Parliaments and Governments. Parliaments are obviously highly concerned when Governments submit the budget to them. The French Office issues recommendations to enlighten our Parliament and also those who govern us. Therefore, in the space field, we have sounded the alarm: if a strong European space policy is not implemented immediately to plan for the period after Ariane, Europe will lose its rank among the foremost space nations.

During our travel to other countries active in the space field, we were able to observe their high development of fabulous space programmes for the future, based on a very strong political determination. If we aren't careful, our Europe, after verging on excellence, will fall back to a very low level. When budgets no longer keep up, when teams no longer have the means to conduct long-term programmes, engineers quit research centres and industrial companies lose their specialists. That's why we entitled our report: 'Space policy, audacity or decline'.

Mr Claude Birraux, president. Bearing in mind the economic stakes, members of Government, regardless of their political label, cannot lose interest in these issues. But reasonable promotion must take account of the possible dangers, especially environmental effects and the safeguard of public freedoms.

I now invite you to visit the Palais-Bourbon, after which the president of the National Assembly will receive us for lunch.

NEW TECHNOLOGIES, QUESTIONS ASKED BY SOCIETY AND ROLE OF PARLIAMENTS

INTRODUCTION

Mr Claude Birraux, MP, president of OPECST

This afternoon we are going to address another issue that was hinted at this morning. How do Parliaments answer the societal questions raised by the use of new technologies? How can they affirm their legitimacy in analysing risks?

Progressively, alongside goals of scientific excellence and technological transfer, the need has emerged to take 'social acceptability' into consideration in Europe. For this purpose, several mechanisms have been set in place: public information and public consultation procedures, and risk analysis mechanisms.

The Ljubljana process fits into the continuation of this evolution: projects conducted in cooperation must meet societal needs and be sufficiently 'clear' to obtain the support of citizens.

This approach expresses an opinion widely shared by our countries. Therefore, the time has come to think together about the manner in which these principles should be implemented, as well as about the role our Parliaments can play in this field. Our meeting offers us such an opportunity.

How have Parliaments got involved in the societal debates raised by the use of new technologies? Can we today make an assessment of the techniques used since the end of the 1980s – consensus conferences, citizens' conferences, or else forums and public debates?

As regards compliance with the rules specific to scientific processes, shouldn't it be acknowledged that, in this field, there are insurmountable constraints which prevent dealing in the same manner with theories that have been verified and those that have not, which constraints create asymmetry between the scientist and the novice and are hardly compatible with the principle of absolute transparency or with the requirement of immediate certainty? What evolutions appear desirable?

It's not merely a matter of procedural issues here. Basically, the fact that the societal questions have been taken into account has had beneficial effects.

Showing the very great reactivity of European states and of the European Union, which have stepped up their initiatives to better assess and manage risks and to inform citizens, this fact has allowed a better awareness to be gained of the knowledge deficit in some disciplines, such as toxicology and epidemiology.

This should also make us understand that the construction of a European Research Area depends on the capacity of EU states to answer these questions in a more

consistent manner. Research, technological innovation and economic growth in Europe indeed risk suffering from the lack of an adapted and coordinated regulatory approach.

The efforts may be compromised that have been made in the European Union to combat the increasing loss of interest in scientific studies and careers, promote the mobility of researchers and abolish borders in the European territory, discourage expatriations and delocalisations to other continents, encourage private investment in research and vitalise risk capital.

To facilitate the comprehension of European citizens, it is also necessary to seek greater consistency of public policies, especially those impacting the means used by research:

Consistency of the applicable ethical principles, as in the biomedical research field or that of information technologies;

Consistency of policies aimed at meeting the expectations of society and of the means assigned to research to meet them. These means are not only financial but also technical and scientific – I am thinking in particular here about the highly controversial issue of field scale tests of genetically modified plants or about research carried out in neurosciences;

Consistency of the actions speeding up technology transfer and implementation processes and those proposing to assess the consequences and convince citizens;

Consistency, last, of the goals aimed at meeting the short- and medium-term concerns of European citizens, answering the needs of mankind in continents more deprived than ours and preparing, for future generations, a quality environment.

The task is immense and difficult owing to the variety of the approaches and priorities within our societies, the multiplicity of objectives, and the influence exercised by the media. But this challenge must be taken up and Parliaments can help.

The questions of society must not in effect obstruct the development of research and innovation, but, on the contrary, enrich science and technology policies, without fear becoming the only lever of European research or the decisive criterion in choosing research and development programmes.

PARLIAMENTS AND SCIENTIFIC ASSESSMENT OF NEW TECHNOLOGIES

Mrs Ulla Burchardt, MP, chair of the Committee on Education, Research and Technology Assessment at the German Bundestag

This morning we really understood that the organisation of research policies in Parliaments of the Member States shows great contrast. The experiences of institutions, and therefore the assessment of research, are very different. In this context it may appear difficult to give a talk of interest to all the participants present and, above all, make a useful contribution answering our common concerns and allowing a joint approach to be reached.

Mr president, I will not answer all the questions you have raised, as a single person could not cope. I will merely address a few of the major topics, with modesty and reserve, my aim being to find the means to make headway with our joint technologies assessment project.

I will recall, first, the reasons why the assessment of technologies at parliamentary level is essential. I will then give some information on the science policy and the assessment of technologies within the German Parliament. After, I'll say a word on my idea of technology assessment advice. Last, I'll return to the proposals expressed this morning, whose aim is to allow a better coordination of technology assessments and scientific policies within our parliamentary institutions.

Why is it essential for us to have an assessment of research technologies?

First reason: in the knowledge society in which we live, our decision-making must, if we want to legitimise it, be based on clear knowledge. We must know how to organise the reception of knowledge and make use of it. The decisions we take in the field of technologies will have an impact on the lives of the citizens who elected us, and on the evolution of our economies and societies, which requires basing ourselves on this knowledge society.

Second reason: democratic politics must strive to solve problems, many of which require our urgent attention: climate warming, ageing of our societies, environmental problems, etc. To solve them together, the help of scientists and technology specialists is essential. Technological progress is indeed always equivocal: it may be positive, but also – Europe's history is full of examples in this respect – negative. Such an equivocal nature must constantly be present in our minds: when we take decisions on the technological plane we must always have well defined their positive and negative effects. Isn't climate change, for instance, linked to the decisions we took in the past in the fields of transport or consumption? To face the colossal challenges awaiting us in this respect, we must consequently know which techniques, which structures and which institutional innovations could avoid climate change becoming even greater.

Third reason: a large number of experts' reports and of very different studies are made. Not only are we flooded with information, but NGOs and companies make no difficulty of engaging in lobbying when they need certain decisions to be taken. In this confusion, we are no further ahead than ordinary citizens themselves: we don't know who to believe. We must therefore develop an assessment system to distinguish, in this flow of information and of experts' reports, the really valid elements and those which are not.

Last, we need scientific information which is sufficiently 'pre-digested' – in the nuclear field, for instance – to make use of it in our political decision-making.

These few remarks lead me to launch a compelling plea for an independent science assessment body in each Parliament, entirely devoted to this matter and funded by Parliament, without being accountable except to ourselves. That way, the needs of parliamentarains will be taken into account.

The Bundestag decided in 1997 to set up a special Office to assess technology. This independent Office has a budget of 2 million euros allowing us to carry out the studies we feel important, after the committees have expressed proposals and after the Bundestag has given its opinion. The specific issues related to science and technology relate to all topics – health, the environment, defence, etc. – and concern all the specialised committees.

This pilot body has a monitoring and decision-making right, part of its powers being delegated to a rapporteur, and it is this spokesperson, member of a political group, who ensures cooperation with the scientific community. We meet the representatives of the latter at least once a month to study the study briefs to be assigned and discuss together the means of presenting the results of studies to our colleagues and also to the general public.

I'll now turn to my idea of parliamentary advice on science and technology assessment.

For our part, the studies we decide to carry out or not on the basis of proposals expressed by the committees do not have the sole aim of assessing the consequences of new technologies. In 2003, for instance, we conducted a major study on nanotechnologies in relation to their definition, prospects as regards research, existing applications and also the impact on the environment and on the health of persons working on products resulting from nanotechnologies or using them. The brief concerning, for instance, research, was very precise so as to provide for legislation to be adapted to the results. Our aim is not therefore to solely launch research but also to help politicians in their decision-making.

We also ask scientists to inform us very early about the possible avenues for reflection. We have, for example, made a major enquiry on the future of work. The aim was to ascertain the extent to which biotechnologies, nanotechnologies, and biointelligence technologies can have repercussions on employment, the activities of various sectors, and the organisation of work tomorrow, so as to anticipate their possible impact on population qualification needs, for instance. There is indeed no point in having marvellous technologies if employees capable of using them in companies, or even contributing added value to them, are lacking.

We must also, and above all, assess political strategies. We questioned ourselves, for example, about the positive and negative effects of encouraging renewable energies in the context of international competition. Europe could perhaps do better than other countries in the world in this respect.

The assessment of technologies made by parliamentarians must, as emphasised this morning, develop and be more constructive. It is in the interest of us all. We must therefore network more and transfer better from one country to another accumulated experiences as regards the assessment of technologies in the various European countries. I am therefore naturally enthusiastic about the proposal expressed on this mater. I will make two proposals in this respect.

The open coordination method implies first of all the existence of a common document, which could be a kind of work manual to which all those concerned by the topic would refer and which would provide insight into the approach of all European countries regarding the assessment of technologies. To create such an instrument, consultations are of course necessary. After the Berlin Conference, we began to have exchanges with each other. Some of my Greman colleagues accepted the invitation to travel to other Parliaments to explain how this model operates in Germany. Similarly, I imagine that my French colleagues have had bilateral contacts and are presenting their model. We should resolutely encourage all parliamentarians concerned to have such exchanges.

Bearing in mind the various activities and numerous scientific results we are producing, it would moreover be advisable, for us Europeans, to have a hub gathering information flows and then directing them to the right channels. It would be a kind of networked base making it possible to assess technologies at European level. Many of you are acquainted with the EPTA network which allows all technology assessment data to be exchanged. I suggest widening Mr Busquin's proposal: in conjunction with the EPTA network, couldn't we establish an interparliamentary network so as to take better advantage of each and everyone's knowledge and assessments? *(Applause.)*

Mr Claude Birraux, president. I can assure you that the French parliamentary Office has flooded the EPTA site with studies in French and in English, and even in Spanish and German, and everyone should do the same. It would also be necessary to question ourselves about the means of increasing the number of persons consulting the network.

CIVIL RIGHTS IN THE UBIQUITOUS SOCIETY

Mr Jyrki Kasvi, MP, deputy-chair of the Committee of the Future at the Finnish Parliament

The assessment of new technologies, very useful for our Parliaments, is today limited to their technological and economic aspects and does not look sufficiently into their human and social impact. It is however essential to understand how these new technologies are changing our societies and know their impact on human beings. As information and communication technologies are developing massively, what will our societies be like and how will they impact our civic rights?

Our societies are becoming increasingly dependent on technologies. However, far more than our legislation, technologies define what we can do and what we can't.

Why do totalitarian regimes and media giants have so many problems with the Internet? Because of the values behind their first operating protocols. If these protocols had been determined in Leningrad or Moscow rather than San Francisco or Los Angeles, and not in the 1970s, the Internet and the world based on it would be totally different today. The Internet and other technologies represent a challenge for us, legislators.

It is easy to think that our values could change in keeping with the changes made by technology in rules, rights and responsibilities in our societies, but the result could be disturbing.

For eighteen years, Theodore Kaczynski, alias Unabomber, haunted the United States with his booby-trapped letters, killing three people and wounding twenty-nine. During all this period, nobody proposed that the authorities should collect information on our paper mail. Nor did anybody here think about such action when anthrax-poisoned letters were sent by Bruce Ivins in 2001, killing five and contaminating seventeen. Why do we accept information being collected from our email and our phone calls, but not from our postcards and our letters? For how long will the screening of our mail still form an infringement of our private sphere?

The lessons we must draw from the Kaczynski and Ivins affairs is that our civic rights should also be taken into account in the digital field, at the risk of jeopardising our values and our rights.

Dear colleagues, new technologies have developed considerably in recent years and great changes also await us in the years ahead. The development of the information society is entering a new phase. According to a Finnish telecommunications company, technologies will even be omnipresent. The challenge to which we must rise today is similar to that which had to be met by societies based on agriculture, which had to change in a few decades owing to the development of industry.

On what values are we going to base our new societies? What civic rights, what responsibilities are we going to grant to our citizens?

Is the defence of the private sphere of our fellow citizens against criminals, or even against companies or Governments a losing battle? Haven't we given the possibility to some computing giants to spy on our computers, allowing them to know what music we listen to?

Perhaps we should make a U-turn, as proposed by David Brin in his book 'The transparent society'. According to him, as the battle is lost, we should renounce the private sphere and give access to everything and everyone, for example by connecting all surveillance cameras to the Internet, including the cameras watching the operators so that those who are watched can watch those watching them. In our societies, don't our mobile phones already allow us to be located – unless we pay for a service tasked with thwarting the searches of our jealous wives...

Any technology can be misused if it falls into the wrong hands. In a few years, RFID and biometric identification will exist everywhere. Imagine what would happen if someone had access to your biometric passport's identification chip following a mere failure of the scanning security system: anybody could take your place and act in your name! Some European passports have already been cracked. Moreover, do you know the coding keys your countries use for their biometric passports?

Technology is supposed to improve security, but it can also endanger it if we lack prudence.

What about the freedom of expression?

An immense factor of equality, the Internet provides every user with the potential to make his site a mass media, which obviously frightens the establishment owing to the power of rumour. It has moreover often been difficult for politicians and leaders to understand the difficulty of controlling this kind of situation. Worried, the establishment has indeed tried to limit the freedom of expression allowed by the Internet, but it's like asking a fish to breath air!

Asking telecommunications companies to be censors would make them police officers and judges at the same time. To whom could clients then turn to complain? In any case no country has sufficient resources to control everything. China, for instance, has recruited more than 30,000 police officers to monitor discussions on the Internet, but it has failed. If that were not the case, we wouldn't know anything about what is happening in that country or in Tibet.

Technological development underscores old rights which had not been endangered in the past, and makes new rights appear.

To take the example of the right to an identity, identity violation is a very widespread crime today. Our identity, our most precious belonging, has not been protected by the law until now. Our legislations are no longer adapted.

Similarly, the right of access to electronic communications and to digital services is today a fundamental right. It is very awkward to envisage limiting access to the Internet to thwart some crimes, in the event of information sharing, for instance.

Dear friends, the evolution of civic rights has not been the subject of sufficiently broad debates. True, data security has been giving rise to heated discussions since a few years, but don't they mainly concern foreign threats, or even the practices of our neighbours?

What is the risk? Imagine that you had access to the police record, the accounts or the personal data on the health of your daughter or son. Would you look at them or not? Those who envisage never doing so or only in the event of suspicion, raise your hand! All of you, you'd look, because isn't it a matter here of your son or your daughter?

You're not the first I'm asking these questions. As a general rule, it's to the last question, that about whether they have already done something of this kind, to which people unanimously answer yes. Admittedly, you, as parliamentarians, cannot publicly admit it!

Dear colleagues, digital crime is a global problem. However most infringements, as regards digital rights, are committed by us, ordinary people. That's why our information systems and our governmental systems must be perfectly secure to protect us also from our own misuses *(Applause.)*

DEBATE

Mr Vincenzo Maria Vita, senator, deputy chair of the Education Committee at the Italian Senate

The new century ushers in a millennium full of uncertainties, which will be marked by humankind's attempt to master living matter and by control over our own minds.

In the field of communication technologies, the information age and, more broadly, the digital age, have hugely accelerated the exchange of information, which has become increasingly pervasive until ultimately replacing the age of electricity and the relational structure of analogue time.

Science and technology are the interwoven cause and effect of the sweeping changes in production techniques, from the Ford and Taylor models of yore to modern networked enterprises. Immaterial goods have come to stay side by side with material goods. The real and the virtual often overlap; at times one cannot tell which is which. We are increasingly part of a post-electricity and post-alphabet universe, of which the Internet, blogs and Web 2.0 interactivity are a manifest representation.

This brief and sketchy introduction serves to underline that the new century will be marked by a conflict between the huge opportunities to access and share the library of knowledge that goes along with the growth of citizenship and, on the other hand, the danger of a further concentration of power, the profit-orientated exploitation of non-material wealth that goes along with the spread of patents and a colossal digital divide: the haves and have nots, the knows and know nots.

This is the unprecedented question that Parliaments have to tackle, a question that is gaining digital momentum: how to address and mould – following the principles of democracy – processes that are faster than traditional decision-making time-frames, processes which were unforeseeable even at the time of the Lisbon strategy?

Parliaments are involved in this process, they struggle to discharge their duties, pressed by the combined cogency of upstream acquisition of specialised knowledge and downstream impact assessment.

The assessment of scientific and technological policies raises old and new problems and might require innovative support bodies – especially for parliaments – including highly skilled and independent members.

I appreciate this exchange of views and would like to thank our French colleagues for taking so much care in organising it.

We need to make tough choices and to have the courage to follow up the – possibly revised – Lisbon goals, through an agenda endorsed by national parliaments and under more binding obligations, as was the case with the Maastricht criteria. For our part, we shall try to give ourselves adequate tools, in the Senate of the Republic and the Chamber of Deputies.

Our task will be first of all to ensure equal opportunities and the secular and independent role of Government, while respecting differences of opinion and religion. Some form of moral suasion will have to be used towards the Executive in order to increase budget allocations to culture, communications, education and research: these are not outlays, they are investments. By the same token, it is essential that experiences be networked, while fully respecting cultural differences.

An *ad hoc* European agency might be established, now that the speed of change is such that traditional modes of representation are in jeopardy. In addition to the often debated issues of the "common criteria" of cultural and scientific development, Parliaments are urgently expected to issue tough guidelines setting the quality and quantity of a society of sciences and the Net, thereby trying to restore Europe's key role in the global village, through the enhancement of universities, research centres, the 7th European framework programme and, beyond that, creativity.

For instance, an option on the present regulation of intellectual property is essential, for we are all aware that old forms of regulation are no longer sufficient.

One could list numerous goals, but what really counts is the willingness to make a common effort to revive the functions of assemblies representing the people, *i.e.* democratic control and planning through the active involvement of the parties involved. This effort should be aimed at reconciling the requirements of science and law-makers, interests and political synthesis, by working together with local government in a mutually enriching fashion at the time of *global* policies.

For our part, we are unflinchingly committed to achieving these goals.

Mrs Sarah Bunn, *adviser at the Parliamentary Office of Science and Technology at the UK Parliament.* Could I first of all convey the best wishes of Doctor Ashok Kumar and Professor David Cope, respectively chair and director of our Office, who could not be present today. On the occasion of its twentieth anniversary, POST will assume the presidency of EPTA and we would be pleased to receive your suggestions with a view to the meeting of the network next year, in Westminster.

Following the speech by our Polish colleague, I wish to emphasise how greatly we feel a meeting on nuclear energy would be useful since Great Britain is entering a dismantling phase of its old power stations and is building new generation power plants.

It would also be interesting to mention the position of developing countries as regards parliamentary assessment of science and technology choices. POST has been working for several years with our African colleagues, especially in Uganda: you'll find all the relevant information on our site and on the EPTA site.

Mr Claude Birraux, president. Could you also convey our regards to Doctor Ashok Kumar and to Professor David Cope, with whom we have excellent relations. Moreover I had the opportunity of participating, on their invitation, in a meeting of the chairs of academies of sciences of East Africa. I also recall that EPTA will meet in The Hague on 27 and 28 October 2008.

THE PROGRESS AND DANGERS LINKED TO BIOTECHNOLOGIES

Mr Jean-Yves Le Déaut, MP, vice-president of OPECST

An introductory remark on EPTA, of which I was the second president fifteen or so years ago. EPTA is an excellent instrument, but the problem resides in the insufficient participation of parliamentarians. The divorce between some assessment offices and parliamentarians unfortunately makes the network somewhat ill-assorted.

Support for a knowledge and knowhow society is the founding element of the principle of progress. But progress, perceived as ambivalent, must be controlled. Science must allow us to advance our knowledge, better understand the world and create jobs, while protecting our citizens from health, financial, economic or environmental crises.

A major element of democratic life, science must find a more important place in political life as the time is over when technologies could be imposed by experts alone. Science, ethics, democracy and society should therefore be reconciled.

The example of the development of biotechnologies illustrates the ambivalence between the quest for progress and the fear of the inherent risks. Since the discovery of the DNA molecule in 1953 and the possibility, after 1971, of transferring a foreign gene and getting the receiver to produce the protein for which it codes, there have been many applications: monoclonal antibodies, insulin, recombined vaccines. In 2007, more than half the drugs approved by the Food and Drug Administration were of biotechnological origin.

Cell and tissue engineering, and gene therapy, have appeared, giving rise to DNA as a drug, and the development of biotechnologies has allowed new concepts to be attained like predictive medicine or even personalised medicine.

The progress of biotechnologies is today applied to the depollution of water, grounds, air, or the production of renewable energies. The development of second generation biomass and also phytoremediation use these techniques.

The other side of the coin is that the extension of these technologies to the food field was the last straw in Europe: GMOs are today vilified. The debate has been poorly engaged owing to a certain number of international agrochemical firms which have wished to force these techniques through, in the interest of the patent owner rather than that of the farmer or consumer.

Whereas the first European directive of 1990 was accepted in a situation of general indifference, an uproar occurred ten years or so ago. If a founding law on biotechnologies had been debated beforehand in our Parliaments, this dossier would have been defused.

After drafting a first parliamentary report in 1998, I was tasked in 1992 by the Government with reflecting on field scale experimentation. In 2005 I drafted a report on biotechnologies and chaired the National Assembly fact-finding mission. The measures we then proposed, such as the generalisation of the plant breeder's certificate in the vegetal field, would have no doubt allowed civil peace to be reestablished.

It is dangerous to refuse any GMO trial in Europe whereas we are continuing to accept products from the rest of the world deriving from these same plants. I feel that biotechnologies could contribute to rising to the two challenges of the 21st century, namely climate warming and the exponential growth of the world population. In 2020, each human will have 0.2 hectares to feed himself, as against 0.45 in 1960, which will require more fertilisers and energy. These techniques will therefore be essential one day: second generation GMOs could no doubt be used in agriculture, as they are today in the health field.

A founding law on biotechnologies remains a topical issue in Europe. It should better define the term GMO, include the great diversity of bacterial, vegetal or animal GMOs, frame the coexistence of crops, and define the adventitious presence thresholds authorised in seeds or organic agriculture products. It should also specify whether a consumer product can be labelled 'GMO-free', define the conditions of the production of flavourings and processing aids, provide for support for research in vegetal biology to keep our international expertise capacity, frame the manner in which field scale experimentation can be conducted, and clarify responsibilities between the players of the sector in the event of adventititous dissemination. On these matters, we have taken a midstream approach.

In these heated and complex debates, scientific expertise must be based on four principles: independence, transparency, collegiality and an opening to society.

The question of expertise cannot be dissociated from application of the precautionary principle, as the absence of scientific studies must not serve as an excuse to refrain from acting. The fear of risk must not become the fear of uncertainty. The French Constitutional Act of 2005 states in its Article 5: *'When the occurrence of damage could affect the environment in a serious and irreversible manner, although such occurrence may be uncertain in the current state of scientific knowledge, the public authorities shall ensure, by the application of the precautionary principle in the field assigned to them, that risk assessment procedures are implemented and proportionate, provisional measures are adopted in order to prevent damage occurring.'* It is necessary, and this is a difficulty for the politician, to reach a reasonable practice of risk and precaution.

We are living in a democracy which is increasingly technical but which all the same must not become a technocracy. The elaboration of laws and regulations on new technologies must allow for active citizenship. A new dialogue must arise between the expert, scientist and citizen. Dear European colleagues, we must promote such dialogue.

Mr president. Thank you for this 'reasoned' approach. I'll now give the floor to Messrs. Vialatte and Claeys, tasked with assessing the Bioethics Act of 2004.

LIFE SCIENCES AND SOCIETY: TOMORROW'S BIOETHICS LAWS

Mr Jean-Sébastien Vialatte, MP, member of OPECST

It is particularly interesting to deal with this important issue among EU parliamentarians involved in assessing the advances of science and their impact on society.

France very soon introduced a body of legislation framing the vast field of biomedical ethics. Its originality results from the obligation imposed on OPECST to assess it at least every four years, with a view to its amendment every five years.

OPECST started work last November by taking stock of the new challenges which scientific advances are posing to society and also to the legislator in the field of embryo research, medically assisted procreation, genetic tests and neurosciences.

A first challenge is formed by the considerable extension of the field of research in life sciences. New hopes are arising concerning the treatment and prevention of diseases while innovative diagnosis methods are appearing – genetic tests and imaging. A new phenomenon of the convergence of technologies can be seen, enabling passing from treatment to diagnosis, from chemistry to biology and from there, to nanotechnologies.

A second challenge relates to the acceleration of research due partly to a 'technological voracity' encouraged by the media. Rather ludicrous hopes are appearing but if you raise questions on the meaning and on the limits of innovation you're seen as a hope-dasher. Researchers and legislators alike then take less and less time for analysis.

The generalisation of the access to new technologies, via the Internet, leads to an improvement – real or imaginary – of the knowledge individuals have of their pathology and on the possibilities of curing it, both in their country and abroad.

For want of binding international rules, binding internal legislations are easily circumvented. 'Bioethical tourism' is prospering and creating a gap between the knowledgeable and financially well-to-do and others. There is even a gestational surrogacy market in some developing countries.

Via the Internet, those wishing to obtain a genetic test can do so without the quality of the sample and of the identity of the sampler being checked and without the use of the sample and the data being framed. In the medically assisted procreation field, the Internet promotes the exchange of gametes, recourse to gestational surrogacy or else practices considered dangerous owing to the mother's age.

Without binding international standards, living beings are likely to become a commodity like any other in a globalised world. That's why joint thinking between Parliaments is so important.

As OPECST rapporteurs tasked with assessing the bioethics Act, we are trying to be prudent and respectful of the sometimes contradictory interests, whether it be a matter of procreation, research on stem cells, or neurosciences. While we should not give in to

scientific and technological fascination, nor should we reject progress or lapse into ethical relativism.

Mr Claude Birraux, president. We are here at the heart of one of the most difficult questions to settle because it concerns what is most intimate in life. I am delighted that two of our colleagues, belonging respectively to the majority and the opposition, can work together to find a consensus, without having recourse to experts or even the media.

Mr Alain Claeys, MP, member of OPECST

Some will say that bioethical laws put a brake on scientific research while others that they will automatically follow behind. Nevertheless, I feel they are useful as they oblige the legislator to reconcile researchers' law, patients' law and respect for human dignity. At the French Parliament, as elsewhere in Europe, we are striving to find the narrow line between progress and the necessary respect for the human body.

Whatever the legislations and countries, we will have to rise to four challenges. Referring to research, everyone agrees in saying that all the existing pathways must be worked on, adult stem cells or embryonic stem cells. Will we go further, like some countries, by authorising nucleon transfer? To date, the plunge has not been taken in France, partly because of the problems raised by ovocyte donation.

Medically assisted procreation forms the second challenge. This issue covers that of the preimplantation diagnosis – whose practice must be defined and limited to avoid any eugenic temptation –, that of the anonymity of the donors of gametes – which today runs counter to the demand of persons born through IVF to know their origins –, and that of surrogacy gestation, which is controversial and has given rise to the publication of a report at the Senate.

We must also reflect on predictive medicine and genetic tests, to which increasing recourse is had via the Internet, despite a very binding law. It is also a matter of the organisation of our society insofar as the solidarity principle is defiled here.

The merchandising and patentability of living beings forms the fourth challenge. I will not insist on the risk formed by merchandising. We must reflect, like the European Patent Office, on the mechanical application of the 'patent' notion to living beings. The possible extension of patents leads it to be feared that they no longer form a means of disseminating knowledge but a pure economic rent.

Many other topics must be addressed. I'm thinking in particular about the end-of-life issue – on which the French Parliament is working –, the development of neurosciences and medical imaging.

It is helpful that European Parliaments can exchange on these common issues and compare their regulatory models. This way we can advance matters at the level of international bodies. Six years ago, Germany and France worked to get human reproductive cloning denounced and banned. Unfortunately this initiative was not successful, as some sought to include in this approach the issue of nucleon transfer. Let's hope that meetings like this one can contribute to joint thinking.

DEBATE

Mr Joël de Rosnay, *member of the Scientific Council of OPECST and adviser to the chair of the Cité des sciences et de l'industrie (France).* It appears that the growing complexity of sciences and techniques is making it necessary for relay bodies to exist between politicians and citizens. In France, several research bodies, universities, media and places like the *Cité des sciences et de l'industrie* assume this function. What is the situation elsewhere in Europe?

Mr Philippe Busquin. Various types of structures are indeed working in a complementary way to the Offices. It would no doubt be necessary to network them.

Legislating or not on bioethical issues is of course within the remit of national parliaments. Yet the free circulation of goods and persons makes national frontiers less clear. For instance, we are witnessing a mobility of patients depending on the legislation on medically assisted procreation.

As a European research commissioner, I had to deal with the issue of spare embryonic stem cells at the time of the implementation of the sixth framework programme. I measured how much the representatives of a country could be bound by the position of their Parliament and make a European compromise impossible. This way the Germans kept the ban on the use of embryos dating from after 2003.

If each country legislates in too precise a manner, European cacophony is likely to appear; for want of cooperation between States, we will have to face inextricable situations. Previously we did not legislate. Today, by over legislating we risk inquisitorial trials.

Mr Claude Birraux, president. The French legislator considered that the evolutions of science and the temporary existence of uncertainties made a periodical amendment of bioethics laws necessary. Having said that, we feel it should be affirmed that human body products cannot be negotiated like Cassis de Dijon syrup!

Also, the Oviedo Convention – which France has not yet ratified, to my great shame – gives the signatory countries a common basis on bioethical issues.

Mrs Ullas Burchardt. Germany is indeed faced with a dilemma at European level as regards stem cells.

The law was amended on 1 May 2007. After holding a large number of hearings on the ethical, medical and legal aspects of this issue, MPs sought a fair balance between the protection of life and the freedom of research, two principles enshrined in our Constitution. There were no voting instructions at the Bundestag; political membership did not play any role in decision-making. Parliamentarians acted as true representatives of the people.

It is today difficult for us to reconcile the choices of our society and the need to improve coordination at European level. Perhaps we quite simply have to live with this dilemma.

Mr Jan Staman. As for the relations between OPECST and the various committees, the committee of sciences and education oversees our Office. Also, whether it is a matter of life sciences, biotechnologies or animal welfare, other committees have such matters referred to them. Is this also the case at the French Parliament and at other European Parliaments?

Mr Claude Birraux, president. From the time of the first bioethics Act, Parliament tasked OPECST with assessing the law every four years prior to its amendment. Also, the Government has asked the Biomedicine Agency, created by the bioethics Act of 2004, to also make an assessment. These assessments can be consulted by the public, which will give rise to a national debate, no doubt organised by the national public debate committee. We have asked that our two colleagues, Messrs. Vialatte and Claeys, should be part of the steering committee.

The opinions collected on this occasion will help prepare the text of the new Act. When the latter is debated at the National Assembly, a special committee, composed of MPs from various committees, will be tasked with its consideration. The assessment made by OPECST will then be decisive, since it will help our colleagues to strike a proper balance without neglecting social, moral or metaphysical parameters.

Mr Jean-Sébastien Vialatte. It's the first time that a public debate of this scale will be held. Such an event is difficult to organise and we hope we can draw inspiration from the quality debate that took place in the United Kingdom on hybrid clones.

Mr Philippe Galiay. The question is knowing what society wants. From my experience of the Commission, profuse dialogue between science and society is necessary very much upstream.

For instance, on the initiative of the *Cité des sciences*, a neuronal sciences consensus conference has been launched, coordinated by the King Baudouin Foundation. It is a matter of knowing how far we can go and what point cannot be exceeded. The Commission has funded another project, coordinated by the *Cité des sciences*, operating according to the same methods and aimed at promoting the development of good practices. In this respect, five points are essential.

The countries which best succeed in the scientific and economic realms are those where dialogue between science and society is the most lively.

To develop knowledge societies, public policies must be oriented towards knowledge, bearing in mind that the goals are measured in quantity terms – the 3% of the Barcelona target –, and also quality terms, whether it be a matter of governance or of dialogue between science and society.

With respect to the speed at which science is advancing, the time when reports are communicated and that when decisions should be taken are getting out of step. Therefore bodies are necessary where all the social players – citizens, associations, etc –, can come together. The Commission has launched cooperative research processes grouping these players.

Such bodies must lead to the formulation of pan-European Union common goals and visions, following the example of the code of conduct on nanotechnologies research

adopted in February 2008 by the Commission and submitted to the Council; this code obviously does not intend to be a culminating point but a point of departure, a meeting line for Member States and players.

Lastly, Parliaments should take charge of infusing intense life into this dialogue in the years ahead.

Mr Michel Caboche, *research director at the National Agronomic Research Institute (INRA), member of the Scientific Council of OPECST*. According to Mr Jean-Yves Le Déaut, first generation GMOs have barely any interest for the consumer. This viewpoint must be qualified: they are of no interest to consumers as they mainly concern cattlefood – maize, soya. However, their economic and also ecological interest is real. Whereas 120 million hectares are under GMO crops, the latter form three-quarters of the profits of farmers in comparison to the prices paid to seed breeders; as regards the environment, GMOs help save the consumption of six million vehicles, without mentioning the storage and drying costs of cereals.

Second generation GMOs, which will soon be appearing on the market, will contribute even greater advantages. For instance the polyunsaturated fatty acids they accumulate will have a direct impact on the health of consumers, in other words on the longevity of human beings.

Mr Jyrki Kasvi. The draft motion sets forth that appropriate mechanisms for Governments are necessary as regards the directions to be chosen with respect to sciences and technologies. However, one of the reasons why Western science and technology have had so much success in recent years is the fact that they have escaped State control.

The research world has self-regulating mechanisms. It must keep a certain control over its research goals, if we wish to avoid the situation like today's where a scientist cannot easily fund research outside programmes defined by the European Union.

FINAL DECLARATION

DEBATE ON THE FINAL DECLARATION

Mr Claude Birraux, president. We have now reached the debate on the draft final declaration.

Mr Philippe Busquin proposes to delete in point 1 the words, *'and monitored'*, and add, in the first sentence of the first two points, the term *'assessment'*.

As the word *'monitoring'* is kept in point 2, others propose to also keep in point 1 the words *'and monitored'*.

I therefore propose to replace in point 1 the word *'monitored'* by the word *'assessment'* and, in point 2, the word *'monitoring'* by the word *'assessing'*.

In point 3, the representative of Poland proposes to add, after the adverb *'actively'*, the words *'reinforce scientific and technical education'*.

Mr Philippe Galiay. In point 3, wouldn't it be possible to also open the debate to manufacturers?

Mr Claude Birraux, president. They are already included in 'experts' and 'citizens'.

In point 5, Mrs Ulla Burchardt proposes to delete the second part after the words *'by strengthening'* and replace it with the words: *'the EPTA initiative in national Parliaments and the parliamentary dimension of EPTA'*.

Mr Philippe Busquin. This is not contradictory with point 4.

Still referring to point 5, EPTA today does not cover all of Europe, but only eleven of the twenty-seven Member States. A methodology common to all of them should be implemented. Momentum is to be created.

Mrs Ulla Burchardt. I'm very pleased that my amendment proposals have been accepted.

EPTA should be understood as the core of a networked structure, provided the new Parliaments integrate it as soon as possible. We have a structure that operates well; it mustn't be reinvented from scratch.

Mr Claude Birraux, president. I agree with both Mrs Ulla Burchardt and Mr Philippe Busquin.

We are faced here with a fundamental issue: what is Man? What is his place in society? The answer to this question must be shared by all EU Parliaments.

Nevertheless, it's a good job EPTA exists. In Oslo, it was decided that the network should be organised in two yearly meetings, one in spring, convening the directors, and the other in autumn, grouping parliamentarians. The latter, following the

example of scientists, must attend these meetings if they want to play the role of interface between the network and their Parliament and exchange their experiences.

As for the drafting of the motion, I would be of the opinion to keep a broad wording, to involve all the EU countries, and also to refer to EPTA, so that parliamentarians take an interest in it.

Mr Jos Hessles, *MP, member of the Committee on Economic Affairs of the House of Representatives of the Netherlands*. It is necessary to widen, for parliamentarians, the possibilities of debating these scientific and technological issues. On the other hand, I have reservations as to the immediate creation of new institutions. All the Parliaments of the twenty-seven Member States must take part in EPTA before creating a widened EPTA.

Mr Sergio Belluci, *secretary of TA-Swiss (Switzerland).* Without forgetting the setting in place of institutions assessing technology choices in countries that don't have one.

Mr Claude Birraux, president. This meeting, I hope, has convinced the participants to create a structure allowing ideas to be compared. However the various organisational mechanisms of assessment must be taken into account in terms of Parliaments.

Mr Jan Staman. Let's imagine that the Dutch or Danish Parliaments conclude that their assessment method is not considered good because different from OPECST's, whereas it suits them. What are we going to say to them?

Mr Philippe Busquin. The Lisbon Treaty decided on better liaison between experts and Parliaments as regards science assessment, but each country is entirely free to organise its science assessment. A Parliament can, for instance, delegate this assessment to a specific body. On the other hand, at European level, States must be represented by their parliamentarians, experts being present, if Parliaments so wish, only to assist them.

Mr Jean-Yves Le Déaut. Experts participate in EPTA meetings; the difficulty is that the Parliaments of all the countries are not represented on it.

In Germany, an assessment body is headquartered at Parliament whereas in France the assessment model is based not on a standing technical body but on a different group of experts per project. Mrs Ulla Burchardt's proposal is therefore a good compromise.

Mr Claude Birraux, president. With this in mind, at the end of point 4 the following words could be added: 'support initiatives to strengthen technological assessment in national Parliaments and consolidate the parliamentary dimension of the EPTA network'.

The amendment was adopted by consensus.

Mr Claude Birraux, president. The question now will be that of the follow-up.

Can we consider launching at The Hague an appeal to countries not yet EPTA members? What initiatives will the new members take? How can joint positions be forged?

Similarly, referring to the steering of research, must it be steered by universities, by research bodies, or by the new agencies in France, for instance, which we have created. Who can decide?

Mr Sergio Belluci. The role of national Parliaments must be strengthened, after consultation with experts, by basing ourselves on EPTA, and assessment mechanisms are to be established in EU countries that don't have any yet.

Mr Virginijus Domarkas, *MP, chair of the Committee on Education, Science and Culture at the Lithuanian Diet.* In our country, Parliament indeed works on technology assessment in various fields.

Mr Silvano Moffa, *MP, member of the Committee on Industrial Activities and of the VAST at the Italian Chamber of Deputies.* We agree to give Parliaments their central role in assessment. We therefore agreed in Italy to strengthen the role of Parliament at EPTA.

Mrs Ulla Burchardt. The follow-up, to my mind, will be the EPTA conference, with, to be effective, an agenda organised in advance.

Mr Sergio Belluci. Would it be possible, Mr president, for you to prepare for The Hague meeting, avenues to improve the EPTA network, and could the *Rathenau Instituut* prepare, for its part, a document defining the technology assessment notion, so that everyone has a basis for future discussions?

Mr Philippe Busquin. The Czech presidency and then the Swedish presidency must first put this point on the agenda.

FINAL DECLARATION

At their meeting on September 22, 2008, in Paris, the presidents of the European Parliamentary Committees and Offices for Scientific and Technological Assessment agreed to:

1. Express their **confidence in science and technology to contribute to progress in European societies**. Under appropriate governmental direction and assessment, science and technology guarantee the sustainable development of economic, social, cultural and environmental programs in Europe and throughout the world.
2. Confirm the **major role of Parliaments in directing and assessing public policies in the fields of science and technology**. As expressions of political sovereignty and places of expertise and debate, parliamentary institutions are naturally qualified to play an eminent role in these matters.
3. Underline the **need for Parliaments to actively reinforce scientific and technical education as well as lead civic debates** on the place of science and technology in society. These discussions should take the form deemed most appropriate within each country, but should foster an enlightened and harmonious debate between experts, citizens and elected representatives.
4. Encourage **national Parliaments and the European Parliament to compare assessment practices regularly, work as a network** to exchange expertise more efficiently, support initiatives to strengthen technological assessment in national Parliaments and **consolidate the parliamentary dimension of the EPTA network** (European Parliamentary Technology Assessment).
5. Call upon the European Union, European research ministers and Parliaments within the framework of the European Research Area to **strengthen European dynamism in science and innovation** by reinforcing synergies, reducing procedural complexity, and creating financial contexts to support new, innovative companies and technology transfer.

CLOSING SPEECH

Mrs Valérie Pécresse, minister for higher education and research

Ladies and Gentlemen,

I am particularly pleased to be among you this evening, at the end of an exceptional day. This rare occasion has seen the gathering of all those who, everywhere in Europe, partake in the permanent dialogue between politicians, scientific experts and citizens, which we so often all fervently desire, without always being able to infuse life into it.

For such dialogue to be not only fruitful but quite simply possible, expectations that are sometimes so different that they appear contradictory must find expression here.

Scientists fear in effect that a systematic and irrational distrust of science and progress is behind the fears felt by our societies faced with both deep and unceasing transformations. But this also leads men and women of science to sometimes refuse answering the questions and fears of our societies so as not to fan distrust by countering often irrational fears with rational arguments.

Speaking as a scientist is indeed to accept that knowledge can assume various degrees of certainty. Alongside the best established theories you may find solid conjectures, hypotheses that are simply promising for the time being or even shady areas where uncertainty still reigns.

Speaking as a scientist is to know that even what we believe to be the greatest certainties keep a degree of fragility and that, in their time, they too were audacious but uncertain hypotheses. That's why there is a specifically scientific use of doubt: far from paralysing reflection, doubt helps keep the right distance without which progress itself would become impossible, any innovation then being doomed to disappear, for want of immediate certainty.

Citizens expect a clear and unequivocal answer to their uncertainties from scientists; but these are still not in a position to provide the answers they are hoping for and this gap can even feed incomprehension and reciprocal mistrust. Indeed, while uncertainty is to be found behind all scientific daring, it cannot and must not take the aspect of a risk which society is afraid of accepting to run without even knowing about it.

Therefore, for genuine dialogue to arise between science and society, a third body must intervene, capable of acting as the representative of scientists to citizens and of citizens to scientists, and therefore worthy of everyone's confidence because it heeds everyone's interests.

This third party in which everyone can be confident is, of course, Parliament. Everything destines it to assume this role: in itself, no institution is more open to society than parliamentary assemblies. They draw their legitimacy from society; it is society

which they reflect and it is its needs they must meet. That's why every day citizens walk the corridors of Assemblies to be heard there by those who represent them, when the latter have not already travelled to meet them locally.

Therefore Parliament can never remain indifferent to the fears, expectations and hopes of society which it is its task to serve. Quite the contrary, since it is the place where citizens can express themselves most freely through both political pluralism and the freedom of speech given to each parliamentarian.

Each of us therefore has a duty to listen to and be heedful to society. This, by its very nature, must be an absolute duty because while it lies with politicians to make choices, it also lies with them to make them only after hearing what citizens have to say and propose to them.

Listening and choosing, these are the two responsibilities of men and women politicians. To assume them as best as possible, the very great majority of EU Parliaments have chosen, in barely a few years, to set up bodies capable of appreciating and assessing the science and technology choices open to our societies.

Indeed at a time when the major scientific evolutions of our day were giving rise to myriad questions in everyone's mind – Mr Birraux emphasised this just now –, it was becoming essential for the representatives of the nation to open a body addressing these questions and ensure they have the necessary human and scientific means to answer them.

This is the very purpose of the offices and committees convened here today through you. Leaving aside the infinite variety of their forms and functions, they all share the same characteristic: that of being essential arenas of neutral and pluralistic debate and dialogue, open to all political, intellectual and scientific sensitivities.

This neutrality can be traced back to the specifically parliamentary nature of these bodies: whether composed of politicians or scientific experts, their common purpose is to enlighten the legislature and it alone.

Essentially, the executive indeed lives in a time whose sole horizon is action. It is therefore impossible for it to patiently build the necessary scientific and social consensus to address the topics you deal with daily: to do so, not only is the necessary time required but, even more, open reflection is to be built and you mustn't constantly feel the weight of the next decision hanging over you as it is known that this leads everyone to harden their views or even chose their side in advance.

I am thinking here of the bioethical issues that are particularly delicate and which I faced when I was an MP: when it comes to such issues, urgency is ineffectual, decisions cannot be immediate; on the contrary, decisions must be based on broad work involving cooperation and listening, marked by successive stages, without which a consensus cannot be formed or mature.

On these topics, as on many others, such as nanotechnologies, biotechnologies or information technologies, the views of the French parliamentary Office have been exemplary. Dear Claude Birraux and dear Henri Revol, I wish to pay tribute to the excellent quality of the work you are presiding over, which has allowed French society

to evolve on many topics. Far from skipping from one subject to another as events have unfurled, the Office has indeed managed to meet current demands while regularly returning to a small number of issues in which it was particularly interested, thereby advancing the collective discussion.

The same has applied in the bioethics field, since the work by the Office inspired the first law in this field. Similarly, you placed technological and natural risks at the heart of parliamentary discussions, thereby acting as the precursors of the precautionary principle we all trust in today, which principle, thanks to the work by the Office, does not conflict with scientific progress or oppose it.

To carry out this long-term work, the Office has managed to fully take advantage of the three dimensions of public action: by regularly doing the spadework on particularly delicate subjects, the reports by the Office have opened up public debate on these issues and have done so on sound and politically responsible scientific bases; by this preparatory work, they have also allowed nevertheless major laws to be passed, often in a remarkably calm manner; lastly, after the adoption of this legislation, the Office has always taken it to heart to follow it up to measure its effects and prepare a possible amendment, to take account of the evolution of science.

You have therefore given us a very fine example of the place Parliament can occupy in a mature democracy: that of a strengthened legislature, capable on all topics not only of opening the way for collective discussion, but also of conducting calm and not contentious assessments, and which are analysed from the sole viewpoint of results.

In the wake of a constitutional reform which is going to radically transform the face of our democracy while giving back to Parliament the entire scope of the prerogatives naturally its own, the Office therefore appears as one of the finest examples of what we can hope to build together: a democracy at terms with itself and responsible public action.

The authority of the Office's work, which extends beyond the limits of Parliament to all the associations concerned and to citizens, will allow you to further increase your role. I hope to concretise this key role by calling on the president of the Office to participate in defining the French national strategy for research and innovation.

Thanks to your work, public debate is no longer the sign of mistrust but clearly the first condition for confidence, confidence in progress, admittedly well-considered and no longer instinctive but nonetheless precious. Nothing is indeed more essential than to reestablish everywhere the relation of confidence which traditionally united scientists and the citizens of Europe and which the tremendous technological transformations we have experienced have sometimes shaken.

Nothing is more essential, for in the years ahead the face of our societies is going to change again, further accelerating the sweeping changes to our daily lives. New challenges are indeed facing us and, to rise to them, we will need to base ourselves on one of our greatest riches: the excellence of our researchers resulting from ancient scientific tradition.

That's why, immediately after the informal meeting of European research ministers in Versailles in July 2008, France proposed to its European partners to join their research efforts to rise together to four crucial challenges. Without such new scientific progress, it will indeed be almost impossible for us to cope with the ageing of the population and its consequences on health, climate change, the energy transition upon us, or the need for food security for an ever growing world population.

These four challenges will therefore be at the heart of the European Research Area vision for 2020, a vision which France has been tasked with drafting with its partners and which it has made one of the foremost priorities of its EU presidency.

With this vision for 2020, Europe will prepare the future in the finest way possible: by counting on the European Research Area, and on the intelligence and inventiveness of the peoples of the Union, and by making their joint scientific efforts the basis of our future progress.

That's why, ladies and gentlemen, at the end of this day of discussion on the relations between science and society and the decisive contribution to them by parliamentary bodies, I wanted to launch this appeal to you: from the months ahead we will need you to give life to the fine programme underlying the European Research Area vision for 2020.

To fix a single objective for our research efforts, that of the interest of our societies and the needs of our economies, we will need you. We will need the ties of mutual confidence you have patiently woven with all the players of research and scientific discussion in our countries. We will need the confidence all EU citizens place in you today.

On behalf of the EU Council of Ministers, there was just one thing I wanted to say to you: we are counting on you, on the Science and Technology Options Office of the European Parliament of course, and also on each Office and on each national parliamentary committee to help us build Europe together and also tomorrow's world.

I know that it is freely and independently that you will conduct the work that will allow us to do credit together to each of these major appointments. *(Applause.)*

Mr Claude Birraux, president. Mrs minister, your compliments go straight to our hearts, with regard in particular to the members of the French Office for Scientific and Technological Assessment, united by much friendship and respect, feelings forged in work.

To close this conference, ladies and gentlemen, allow me to leave you with this quotation by the DalaI Lama on which to meditate on the way home: *'Doubt because doubt encourages research and research is the avenue that leads to knowledge'*. Thank you all. *(Applause.)*

LIST OF PARTICIPANTS

Mr Nicolas About, senator (Yvelines), chair of the Senate Social Affairs Committee – France

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