EUROSCIENCE NEWS

Number Nineteen Spring 2002

The regulation of human genetics in Europe

This issue dedicates space to the question of human genetics – the subject of a debate Europe-wide. Research progresses rapidly, and its outcome in the field of stem cells raises hopes in a number of therapies. We offer information on two aspects:

a) the regulation of this research in European Union countries,

b) the general scientific and ethical background of stem cell research.

Readers are invited to add their viewpoints to these two papers.

"The position on human genetics is possibly more diverse within each country than across Europe". This remark at the EU debate on human genetics in December 2000 is certainly right. In all countries there are people who are absolutely against any use of the human embryo in research. On the other hand there exists also a large group of those who give the future development of treatment for nasty and widespread diseases ethically a higher priority. They are in favour of undertaking research on embryonic stem (ES) cells taking into account that a fertilised egg cell used to collect ES cells has to be destroyed. Both positions are found in all European countries. What finally counts for the researcher is how his or her country decides on what line to follow.

At present we find in Europe a wide variety of different legal frameworks.

There is unity in the EU Member States only in one fundamental principle: that human reproductive cloning must be prohibited. This is what the European Charter of Fundamental Rights has laid down in its Article 3, signed by all 15 Member States. The ban on human reproductive cloning, however, is not yet regulated by national law in all countries, neither have all countries ratified the Council of Europe's additional protocol to the Bioethics Convention "on the prohibition of cloning human beings". The 15 EU countries, together with many other European and non – European countries, have supported also the French-German initiative during the last UN General Conference to draft a convention on a world-wide ban on human reproductive cloning. Negotiation on this initiative has just begun at the UN.

There is a plurality of different approaches in Europe to regulating embryo research. And it is not easy to give an overview of the situation, as positions which are not legally fixed are uncertain and can change rapidly under political pressure. Is ES cell research allowed in those countries where no law forbids it?

The most liberal legislation exists in the UK, as does the clearest regulation in favour of the possible use of the human embryos up to the 14th day. ES cell research, including therapeutic cloning techniques, is allowed under strict public control. Until now no creation of a human ES line has been reported from the UK. Last November a court decision exposed a loophole in the regulation that left open the possibility of reproductive human cloning from an adult cell. The UK is now re–regulating this open question.

Finland also allows for research until the 14th day but not production of embryos for research. The country with the highest number of publicly known ES cell lines in the world is Sweden. A clear regulation of the subject is only on the way. At present the law allows research on the embryo to improve assisted reproduction procedures.

In France, law 94-654 forbids the creation of embryos as well as of ES cell lines. The National Bioethics Committee would allow now research on spare embryos for therapeutic purposes, and the National Assembly has been supporting this position after a rather controversial debate. However, the law will be made only after the elections.

Is it allowed when not forbidden?

The German Bundestag has given a very restricted opening to research on ES cell lines that existed before a deadline – possibly 1.1.02. The problem here will be to demonstrate the consent of both parents to the line to be used.

Twelve countries have signed the Council of Europe Convention on Human Rights and Biomedicine, which in article 18 does not allow the creation of an embryo for research and postulates the protection of the embryo; it thus excludes therapeutic cloning. The Czech Republic, Denmark, Estonia, Georgia, Hungary, Portugal, Romania, San Marino, Slovakia, and Spain have ratified the convention.

Ireland protects the unborn child in its constitution, abortion is prohibited and the present referendum to change the abortion law a little has led to a heated debate. In Austria also the human embryo is protected. Netherlands and Belgium have yet to prepare a law.

JLF & FP

Résumé

L'utilisation d'embryons humains pour la recherche est au cıur de débats nationaux et à l'Union européenne. Les positions sont aussi diverses à l'intérieur de chaque pays qu'à travers l'Europe. Cependant il y a accord dans les pays de l'UE pour bannir le clonage humain reproductif (Charte des droits fondamentaux). Un aperçu de la situation légale dans différents pays de l'Union est donné.

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NEWS

The Rammal Award 2001

On January 21, the Rammal Award Panel selected Professor Ahmad Teebi, a geneticist of Palestinian origin, as the awardee for 2001.

Professor Teebi (pictured) leads the Clinical Genetics Department of Sick Children in Toronto, Canada. He also teaches paediatrics and genetics at Toronto University. His scientific contribution in genetics is internationally recognised. In 1997, he published an acclaimed book on genetic diseases among Arabic populations.

Ahmad Teebi was born in Beirut in 1949 of Palestinian parents, and grew up in Kuwait. He was one of the founders of the Kuwaiti Centre for Medical Genetics in 1981, where he started the first programme for the detection of neonatal diseases in the Arab world, and identified 25 new genetic diseases among these populations. In 1990, the gulf war broke out while he was visiting the USA, and he was unable to return to his country. This was the starting point of a prestigious North American career at the universities of Yale, McGill, and Toronto. Faithful to his origins, he founded and became the first President of the Middle East Genetics Association (MEGA), which aims at gathering all scientists of this area of the world, regardless of their origin, religion or political beliefs.

His prolific and time consuming scientific production never impeded Professor Teebi from giving his time, expertise and resources to alleviate the suffering of the sick in the Palestinian refugee camps. On multiple occasions he volunteered for humanitarian missions to Palestine, and has been active in promoting such missions.

Rémy Lestienne
Scientific Secretary, Rammal Panel

New science and technology based professions in Europe

This EC sponsored Conference, organised by EUROSCIENCE, will take place at Bischenberg near Strasbourg on November 6-9, 2002. Participating scientists, sociologists, teachers, employers, trades-unionists and representatives of young scientists associations will draft and document practical recommendations to be presented to the Commission and to national governments. Major questions to be addressed include:

– how can we anticipate more accurately future developments in scientific job profiles and career structures?
– how can Europe become more attractive to the new jobs expected from more diversified research needs throughout the world?
– how can we improve training schemes, including doctoral and post-doctoral programmes, to make scientific education in Europe more user friendly?
– how can scientific careers become more compatible between countries?

All EUROSCIENCE members are invited to participate in the preparation of the conference. Information on work groups is available on the EUROSCIENCE website (www.euroscience.org). Advance registration can be mailed directly to the EUROSCIENCE office.

Claude Kordon

New director for the OST, Paris

Laurence Esterle has been appointed as Director of the Observatoire des Sciences et Techniques, in Paris. This institute is dedicated to the production of science and technology indicators, to the analysis of data related to the French science and innovation system, and to making comparisons with other countries. The chairman of its Board is Pierre Papon.

Laurence Esterle, a physician and biologist at INSERM, will succeed Rémi Barré, who founded the OST and was its first director for twelve years. Rémi Barré and Pierre Papon are founder members of EUROSCIENCE, of which Laurence Esterle is also a member.

Françoise Praderie

Euroscience 2002 Budapest meeting and General Assembly

Arrangements for the Biennial Meeting (14-16 June) are nearing completion.

There will be plenary sessions on (1) Integrating the European Research Area – including the CEEC, followed by parallel sessions looking at particular aspects, and (2) Ethics in Scientific Research and R&D Management. A Workshop will follow on Science for Reduction of Risk and Sustainable Development. There will also be a public lecture by a major figure. Our General Assembly will take place on the mornings of June 15 and 16.

Check www.euroscience.org now for details, and registration information. June is now very close – reserve your place now! Full up-to-the minute information on all aspects of the meeting can be obtained from the Strasbourg office (office@euroscience.ws).

An original initiative to establish shared research infrastructures

The Canadian Foundation for Innovation (CFI) was established in 1997 to build a balanced network of research infrastructures throughout the country. Although entirely funded by the Federal Government, it is an independent agency.

The latest call for applications produced some 600 projects, mostly from universities or specialised research agencies. Projects ranged from high throughput wiring networks to shared functional genomics platforms, ocean drilling ships and access to satellites to study marine pollution or the environmental impact of human habitation.

After a stringent review process – involving external reviewers, expert committees in major disciplines, and a three–day meeting of nine interdisciplinary, international committees – 208 projects were selected. Three reviewers per project in each committee markedly contributed to the fairness of the evaluation process. Criteria focussed on research quality, but considered also the potential for training young scientists and promoting regional co-operation.

Although more projects were selected than initially anticipated, the CFI decided to fund them all in view of their high quality, allocating a budget of 588M $ Canadian (400M euros). Including partner funding by universities, provincial governments or companies, a total new investment of one billion euros will result.

The CFI strategy is very original and efficient in promoting cutting edge research, by networking strong interactions between scientific communities and increasing high level interdisciplinary training of young scientists. Europe could certainly use a comparable, cost effective programme, based on fair and transparent evaluation, that could upgrade technology, promote links between laboratories, and offer new training opportunities for young scientists within the European Research Area – an ambition which unfortunately still meets with resistance from European research ministers (see EUROSCIENCE News no. 16 p.1).

More detailed information can be found on the CFI website www.innovation.ca/whatsnew

Claude Kordon

Frans Heyn

Frans Heyn passed away on 29 December 2001. From 1998 to 2000, he was a very active member of the EUROSCIENCE Governing Board, leaving only when illness forced him to. Being Dutch, working since 1981 in Switzerland (CERN), well known in numerous European science circles, his work in EUROSCIENCE was a formidable asset to the association. Frans was among the few, with R. Klapisch, who created the EUROSCIENCE Léman section.

He was instrumental in inviting CERN to be an associate member of EUROSCIENCE. As convenor of the Science Policy Working Group, he organised with F. Sgard just prior to the 1999 election a debate on scientific research at the European Parliament. He enthusiastically, with B. Hoffmann, promoted the idea of a EUROSCIENCE doctoral student mobility award. He initiated the creation of the Brussels EUROSCIENCE section. Finally he was a remarkable advocate for EUROSCIENCE, in particular at the European Commission, and also publishing articles on the association in major newspapers.

This is of course an incomplete homage, leaving aside his scientific and administrative career. I simply wished to stress his indefatigable support to EUROSCIENCE, which he saw as a major enterprise in forging the future of European science.

Françoise Praderie

THE SWEDISH RESEARCH COUNCIL & EUROSCIENCE SEEKS A PROJECT LEADER

for the organisation of a European Meeting on Science & Technology in Stockholm 2004. The meeting aims to:

– stimulate cross–disciplinary interaction;
– facilitate the formation and development of a competitive European Research Area;
– enhance the European public's awareness of and interest in Science & Technology;
– enhance the dialogue between scientists and society at large.

The Project Leader will be responsible for securing the financial and organisational foundations of the event by;

– developing relations with funding bodies and other supporting organisations;
– identifying themes and speakers in collaboration with a Steering Committee;
– addressing the practicalities of a large-scale international conference.

He/she should have a background in research and/or scientific communication, and

– be an experienced organiser;
– have knowledge of research and funding institutions, and an extended network of contacts;
– possess excellent oral and written communication skills;
– be a good motivator;
– have good social skills.

The position, within the Swedish Research Council, is for one year, with good possibilities of extension.

For further information, contact Carl Johan Sundberg (EUROSCIENCE) at Carl.J.Sundberg@cmi.ki.se, phone +46 70517 6886, or Tina Zethraeus (Swedish Research Council) at tina.zethraeus@vr.se, phone +46 8546 44 123.

Applicants should send a full CV with names, postal and e–mail addresses of two referees to The Swedish Research Council, SE-103 78, Stockholm, Sweden, quoting reference 142–2002–1332, by 10 May 2002.

Notes from the Euroscience diary

If you have items to report for this section in future issues, please let the office or the editor know.

December 6, 2001 President Connerade and Secretary General Seltz met in Brussels with M. Mitsos, Director General, DG Research. They discussed a range of issues relating to EUROSCIENCE and the European Commission.

December 14 A café des sciences was established in Meudon, a city in the suburbs of Paris, which hosts a site of the Paris Observatory. The café was created under the aegis of the French Physical Society, EUROSCIENCE and a local academy.

December 15 The EUROSCIENCE Governing Board met in Paris.

New Governing Board member Christine Heller del Riego (left) relaxing during a break in the December Board meeting with Euroscience Assistant Laurence Nottellet. Honorary Vice-President Claude Kordon is in the background.

January 11, 2002 Andrei Rhoe and Françoise Praderie met with Nobel Prize winner and member of the EUROSCIENCE honorary committee Pierre-Gilles de Gennes, to discuss actions to raise funds for the EUROSCIENCE Foundation.

January 14 President Connerade, Secretary General Seltz, and Board Member Frederic Sgard met with Science Commissioner Busquin (see report p.6 this issue).

January 17 Board Member Carl Sundberg met with Philip Campbell, Editor of Nature, to discuss the planned 'big' EUROSCIENCE meeting in Stockholm in 2004 (ES2004).

January 21 The Rammal Award panel met in Paris to discuss the award of the 2002 medal (see report p.2 this issue).

January 21 President Connerade met with Dr. Peter Green of Alphagalileo to discuss recent events in the EC and current plans for a European Science Press Agency.

January 21 Secretary General Seltz discussed funding for the Workshop at the forthcoming Budapest conference (see p.2 this issue) with M. Massué, Executive Secretary EUR-OPA Major Risks Agreement of the Council of Europe.

January 24 President Connerade, Secretary General Seltz, and Board Member Frédéric Sgard met in Brussels with Jürgen Rosenbaum and a committee of representatives of the Public Relations section of the Commission headed by M. Rosenbaum, to discuss possible developments in science publishing in Europe.

January 25 Secretary General Seltz introduced EUROSCIENCE to Bogdan Torcatoriu, co-secretary of the Committee on Culture, Science and Education of the Parliamentary Assembly of the Council of Europe, and to Claude Birraux, member of the Parliament, and discussed matters of scientific communication.

January 29 President Connerade met with Professor Ian Butterworth, President of ALLEA, in London. They discussed ways in which our societies can collaborate and agreed to co-ordinate our actions more closely in the future.

January 30 President Connerade and Ms Janice Leeming of the British Association discussed collaboration between our Associations and explored how we could work together.

January 31 A meeting took place on ES2004 plans between Carl Sundberg, Tina Zethraeus, project leader at Swedish Research Council and Board Member and science journalist Anna Schytt.

February 2 Frédéric Sgard and Françoise Praderie attended, at la Cité des Sciences et de l'Industrie in Paris, an international round table on "Therapeutic cloning and embryo research", which was organised on the occasion of the revision of French bioethics laws.

February 4 Carl Sundberg had meetings concerning ES2004 with Thomas Östros, Swedish Minister of Education & Research, and Pär Omling, Director General of the Swedish Research Council.

February 6 Tina Zethraeus made a presentation on ES2004 to Research Forum (a joint body of heads of Swedish Funding Agencies & MPs).

February 7 President Connerade met M. Olivier Postel-Vinay, the Editor of La Recherche, to discuss plans currently under serious consideration for a new European Letter on science.

February 11 President Connerade met with M. Balavoine, the Scientific Counsellor of the French Embassy in London, to inform him about the activities of EUROSCIENCE.

February 14-19 Carl Sundberg, Tina Zethraeus and Treasurer Winter attended the AAAS Annual Meeting in Boston, USA, to discuss plans for ES2004 with a wide variety of experts from the US (including Al Teich, Science Policy Head, and Mike Strauss, Programme Director, AAAS), and with other participants including the European Science Communication Network (ESCN) and the EU Commission DG Research.

February 28 President Connerade met with Monsieur Laurent Chaminade, a representative of Imperial College Press and World Scientific Publishing, to discuss the possibility of EUROSCIENCE providing material for publication on topical issues concerning science and society.

The next hundred years

"The most profound danger to world peace in the coming years will stem not from the irrational acts of states or individuals but from the legitimate demands of the world's dispossessed. Of these poor and disenfranchised the majority live a marginal existence in equatorial climates. Global warming, not of their making but originating with the wealthy few, will affect their fragile ecologies most. Their situation will be desperate, and manifestly unjust. It cannot be expected, therefore, that in all cases they will be content to await the beneficence of the rich. If, then, we permit the devastating power of modern weaponry to spread through this combustible human landscape, we invite a conflagration that can engulf both rich and poor. The only hope for the future lies in co-operative international action, legitimised by democracy. It is time to turn our backs on the unilateral search for security, in which we seek to shelter behind walls. Instead we must persist in the quest for united action to counter both global warming and a weaponised world. These twin goals will constitute vital components of stability as we move toward the wider degree of social justice that alone gives hope of peace. Some of the needed legal instruments are already at hand, such as the Anti Ballistic Missile (ABM) Treaty, the Convention on Climate Change, the Strategic Arms Reduction Treaties (START), and the Comprehensive Test Ban Treaty. As concerned citizens we urge all governments to commit to these goals which constitute steps on the way to the replacement of war by law. To survive in the world we have transformed we must learn to think in a new way. As never before, the future of each depends on the good of all".

The above statement was issued in December 2001 on the 50th Anniversary of the Nobel Prizes. It was signed by 110 Nobel Laureates.

EUROSCIENCE: Audited Accounts 2000 (in FRF)

Expenditure		
Salaries	27,709	
Social security Charges	20,531	
	48,240	*48,240*
Administrative Equipment	7,788	
Printing works	68,260	
Fees paid for external help	29,393	
Travel and Subsistence	72,676	
Mailing costs	7,676	
Bank charges	1,716	
General Assembly: direct costs	231,831	
Rammal award	31,172	
	450,512	*450,512*
Depreciation of fixed assets	*10,427*	*10,427*
Total Expenses		**509,179**
Carry forward for projects 2001	*105,672*	*105,672*
Total		**614,851**
Income		
Membership Fees	*167,678*	*167,678*
Subsidies:		
French Ministry of Research	40,000	
C.N.R.S.	60,000	
INSERM	10,000	
Rammal fund	31,172	
	141,172	*141,172*
Subsidies - General Assembly:		
NATO	93,844	
UNESCO	21,314	
Bosch Foundation	136,439	
Council of Europe	6,384	
ESF	7,703	
Univ. Louis Pasteur	20,000	
Bio Valley	13,119	
	298,803	*298,803*
Interest on investments	*7,198*	*7,198*
Total		**614,851**

Euroscience meets with Commissioner Busquin

On January 14, 2002, a EUROSCIENCE delegation met with European Commissioner for Science Busquin. The delegation consisted of Jean-Patrick Connerade (President), Raymond Seltz (Secretary General) and Frédéric Sgard (Head of the EUROSCIENCE Science Policy Working Group). The Commissioner was accompanied by Cyril Robin-Champigneul and Yves S. Dumont.

The meeting took place at the Commission in Brussels on Jan 14th 2002 at 14.00hrs and lasted for a little over one hour. A number of issues were raised.

The EUROSCIENCE delegation began by thanking M. Busquin for his inspiring work in favour of science and technology all over Europe. Particular support was expressed for his new initiative, the 'European Research Area', which is warmly welcomed by scientists from all over the Union. The issues raised in the subsequent discussion included the following.

Problems of mobility persist, and were a concern shared by both the Commission and EUROSCIENCE. Steps to encourage and foster mobility were reviewed in some detail. In particular, the President of

Euroscience proposes that a new "Young European Researcher" status should be created

EUROSCIENCE proposed that a new "Young European Researcher" status should be created, the idea being that all member states would recognise and incorporate it, taking steps to ensure that social protection, pension provisions, medical insurance contributions, etc would extend throughout this period and be carried over into the subsequent career of the researcher, so that mobility would not penalise the recipient of a European Postdoctoral award as it can do now. Monsieur Busquin expressed interest in this idea, pointing out, however, that support would be needed from governments since the implementation would have to be at national level.

There was an extensive discussion of obstacles which remain, and which impede better integration of European science. One

The very important 'human capital' of the Marie Curie Fellows' Association should not be squandered

of the difficulties at national level appears to be a persistent tendency in Member States to 'protect' the local scientific resource against foreign competition, this attitude being more characteristic of middle than of senior management. Part of the solution might be to introduce a greater 'Europeanisation' of the national funding agencies (an idea already advocated in EUROSCIENCE News No. 10, p.1). M. Busquin pointed out that, if only 5% of national funds were allocated to support research from other Member States on a competitive basis, this would provide support essentially matching the money distributed by the Commission, and would result in a large boost for European research. The EUROSCIENCE delegation expressed strong support. Indeed, it was observed that the general aims of the Commission and of EUROSCIENCE were much in harmony, i.e. the 'grass roots' are supportive of the efforts made at the top. Most of the difficulties seemed to be coming from within the scientific establishment at national level. Many young researchers were becoming frustrated by the lack of progress in solving career problems at the European level.

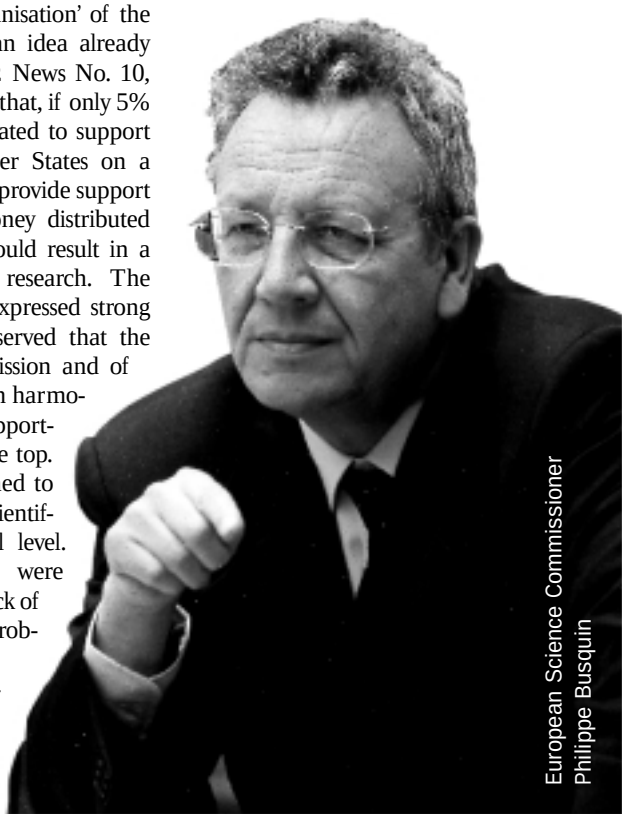
The role and the continued existence of the Marie Curie Fellows' Association were commented on (see EUROSCIENCE News No. 16, p.1). The President of EUROSCIENCE expressed the view that a very important 'human capital' should not be squandered. The Association was one way of holding it together. Means of achieving this aim were discussed at some length, and EUROSCIENCE wanted to assist in this.

The role of the European Parliament in setting up a common legal framework within which certain types of research (for example on stem cells) should be conducted was considered. EUROSCIENCE is already involved in this issue, and the location of its office in Strasbourg is clearly an advantage in approaching MEPs.

The agenda of the meeting also included further points on which EUROSCIENCE wished to report progress to M. Busquin, the most noteworthy being the planned conference on 'New Science and Technology – based professions in Europe' (see p.2 this issue), and the relevant documentation was placed in the hands of M. Busquin's team.

All parties concerned felt that the meeting had been productive and useful, and looked forward to more of the same.

Jean-Patrick Connerade
President, Euroscience



European Science Commissioner Philippe Busquin

FEATURES

The Spanish Presidency: boosting the European research and innovation area in a knowledge-based society

At a moment when the introduction of the Euro demonstrates the impact of common approaches on the European economy and social life, the Spanish Presidency of the European Union Council (1st Semester 2002) takes stock of the opportunity to further advance towards the March 2000 Lisbon European Council objective of becoming the most competitive and dynamic knowledge-based society.

In this context, it has put forward a strategy aimed at strengthening the role of R&D and innovation as the driving force behind economic development and social cohesion. To this aim, it considers it essential to develop a cohesive and integrated European Research and Innovation Area which reinforces the links between scientific and industrial policies and encourages developments from basic research to entrepreneurship.

Narrowing the technological gap between the European Union and the United States must be a fundamental objective of European policies. In order to narrow this gap, it is essential to change the current trend and pursue an ambitious quantitative R&D spending target at the European level.

To embed such performance, robust framework conditions are needed to create a positive environment for investors in R&D and innovation and to develop high levels of dynamic competition. Key indicators of success will include: higher levels of business R&D, higher level of patenting and stronger business innovation performance.

An efficient European Research and Innovation Area requires as well developing a dynamic and competitive European technology market capable of fostering innovation, and progressing towards an attractive European risk capital market, which guarantees cost-efficiency and an adequate support for R&D and innovation.

A favourable regulatory framework, particularly regarding intellectual property regimes is also a prerequisite. This environment should foster entrepreneurship and act as an incentive towards R&D and innovation, supporting the creation, development and consolidation of innovative firms. In this context, it is particularly important to foster the role of biotechnology and enabling technologies as engines of industrial competitiveness.

The encouragement of the mobility of researchers and technologists, particularly inter-sectorial and trans-national, the exchange of best practices and progress towards the opening-up of national RTD programmes will be effective means headed towards making Europe most attractive for the development of new ideas and for new products to find their way to an integrated European market.

During its term, the Spanish Presidency will put every effort to ensure the adoption of the Sixth EU Framework Programme for RTD and Demonstration Activities (2002-2006), highlighting the role to be played by SMEs therein.

A policy of international scientific and technological co-operation requires thorough co-ordination between EU and Member States activities. Along these lines, the Spanish presidency has set itself the objective of developing ways to foster such co-ordination, as an essential requisite for the full operation of the international dimension of the European Research and Innovation Area.

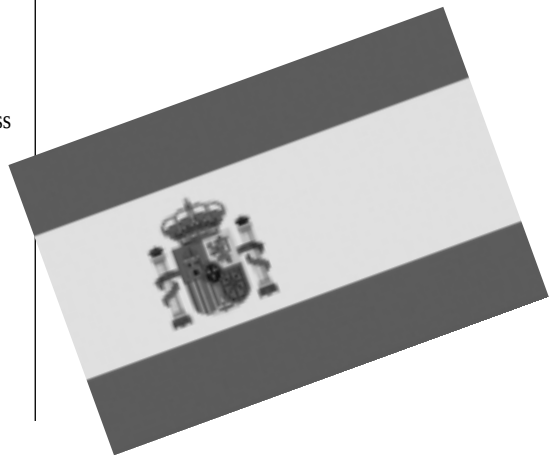
In this context, the Euromediterranean Conference of Industry Ministers scheduled for April 2002 seeks to strengthen innovation and competitiveness in the Mediterranean basin, through increased industrial co-operation. In addition, the March 2002 Meeting of European Union, Latin-American and Caribbean Science and Technology Ministers in Brazil aims at reinforcing scientific and technological co-operation between these regions.

The importance of R&D as an engine for sustainable and competitive growth is another essential aspect of the Spanish agenda. Clear and stable objectives for sustainable development will bring about major economic opportunities, boosting technological innovation and investment while generating growth and employment. To this aim, and taking into account the economic implications of sustainability for overall European industrial competitiveness, it is required to progress towards examining the industrial and environmental dimensions in an integrated manner.

Ramón Marimón
Secretary for Scientific & Technological Policy
Ministry of Science & Technology, Spain

Résumé

Lors de sa présidence de l'Union européenne (UE, 1er semestre 2002), l'Espagne entend renforcer le rôle de la R&D et de l'innovation comme moteurs du développement économique et de la cohésion sociale. Pour cela, elle est attentive aux conditions qui rendent l'espace européen attrayant pour les investisseurs en R&D, en particulier les régimes de propriété intellectuelle, la mobilité des chercheurs et des technologues et l'ouverture des programmes de R&D nationaux. L'Espagne s'efforcera de faire adopter le 6ème Programme-Cadre de RTD durant sa présidence. Elle agira pour développer une meilleure coordination entre l'UE et les Etats membres. Deux conférences chercheront à développer l'innovation et la compétitivité par une coopération renforcée, l'une (avril 2002) rassemblant les ministres de l'industrie du bassin méditerranéen, l'autre (mars 2002) les ministres de la science de l'UE, d'Amérique latine et des Caraïbes.



Stem cells: scientific and ethical issues

Recent discoveries and scientific announcements in the field of stem cell research have triggered an animated debate not only on the scientific and therapeutic significance of this research but most prominently on its ethical justification. This intense discussion which has hit the headlines has prompted European politicians to quickly amend their own national laws to take into account these "unforeseen" developments of science. In parallel, European political bodies have also attempted to produce their own guidelines in order to set up some coordinated policy. But what is really at stake here?

What is a stem cell?

Stem cells have the ability to divide for indefinite periods in culture and can differentiate into various cell types, from neurons to cardiomyocytes. These cells are found in the early embryo, before they specialize to give rise to the various tissues and organs of the organism. In normal development, the newly fertilized egg is totipotent: its differentiation potential is total and the cells from this very early embryo (up to the second cycle of cell division only) have the potential to develop into a complete organism if placed in a uterus. A few days after fertilization and after several cycles of division, these cells begin to specialize into an outer layer of cells which will form the placenta and other supporting tissues needed for foetal development in the uterus and in inner cell mass cells which will go on to form virtually all of the tissues of the body. These cells (which are what we commonly call stem cells) are pluripotent: they can give rise to all types of cells but must be associated with other embryonic cells for foetal development. The pluripotent stem cells undergo further division into stem cells that are programmed to develop into cells tailored for particular functions (blood cells, skin cells etc.). These more specialised stem cells are called multipotent, some of these cells being still present in adults.

It is easy to see why these cells have generated so much excitement in the scientific community and hope for patients. Not only can research on stem cells help to understand the mechanisms of embryogenesis and the complex events that occur during human development but, because of their pluripotency, they could be used in cell therapies to treat a vast array of diseases caused by the destruction of specific cell types or tissues. Thus, stimulated stem cells could develop into specialized cells useful in currently untreatable pathologies such as Parkinson's and Alzheimer's diseases, spinal cord injury and many rare genetic diseases.

What then is the ethical dilemma?

There is first the fear that human stem cell research could lead to reproductive cloning, that is to say to the creation of a human being by the replacement of the nucleus (which contains the genetic material) of a human egg (the ovocyte) by that of a cell from a donor (a technique called somatic cell nuclear transfer), and reimplantation of this egg into the uterus. Such a technique has been used, with limited success, in different animal species (remember Dolly?). The recent announcement by the American company Advanced Cell Technology on very preliminary success (which was quickly contested by many scientists) of human nuclear transfer has strengthened the polemics, although in this case the objective of the company was not reproductive cloning but the establishment of specific tissues for therapeutic uses. While proponents of reproductive cloning advocate that this could constitute a new method to solve infertility problems, the large majority of scientists consider that the risks of this technique (the success rate is extremely low in animals and many "cloned" animals seem to suffer from abnormalities) and progress in other fields of infertility treatment do not warrant research in this subject. In addition, the obvious ethical problem of this technique which could allow eugenic discrimination has led many governments to prepare laws banning reproductive cloning and calls at European and international levels to enforce such a ban worldwide.

Somatic cell nuclear transfer technology is also at the origin of the second ethical problem linked to stem cells. This is commonly called "therapeutic cloning" as opposed to reproductive cloning, because pluripotent stem cells can be engineered with this technique. Indeed, where do pluripotent stem cells come from? Currently, human stem cell lines have been developed from two sources: either directly from inner cell mass of human embryos derived from supernumerary embryos produced by *in vitro* fertilisation for infertility treatment, or from foetal tissues obtained from terminated pregnancies.

The use for research of supernumerary embryos which were produced for sterile couples but are no longer destined to be implanted and thus scheduled for destruction is supported in several European countries (France, Sweden, United Kingdom) provided parental authorization is obtained. It has also been the object of a positive recommendation by the European Ethical committee. However, this resource is limited, as current fertilization techniques are less wasteful in terms of supernumerary embryos. Stem cells from aborted foetuses have already been used directly for cell therapy treatment of neurodegenerative pathologies such as Parkinson's disease, with some encouraging results. However, a large amount of cells is needed for this technique, and these cells may present more limited differentiation potential compared to early embryos. Hence the idea to establish stem cell lines by somatic nuclear transfer technology, the famous "therapeutic cloning". In addition to the fear of diverting research towards reproductive cloning, the ethical problem here concerns the

Pressures could be exerted on women to donate – or sell – their eggs, an operation which is not completely benign

technique's need for ovocytes, and that pressures could be exerted on women to donate (or sell) their eggs, an operation which is not completely benign. Furthermore, some scientists believe that, although such research would help us to understand the mechanisms of cell differentiation, stem cell lines resulting from nuclear transfer may not have similar therapeutic potential compared to native embryonic stem cells. Nevertheless, faced with the potential of treatments, the hopes of

Much basic research still needs to be done before therapeutic uses can be realized

patients and the need to pursue various routes of research on stem cells, countries such as Sweden appear ready to support therapeutic cloning while others such as France and Italy are opposed. Similarly, the European Commission has decided not to fund any research on the subject while the European Ethical committee took a more cautious approach, suggesting that this technique is not at the present time necessary to further research on stem cells, but without absolutely ruling it out in the future.

Finally, the use of embryonic stem cells itself is debated. While stem cell lines are all derived from embryonic tissues, stem cells also exist in adults. Thus, neuronal stem cells have been discovered in adult brain and the skin also contains stem cells; research on adult stem cells has attracted considerable interest and funding. However, beside their obvious scientific interest, these adult stem cells may not be as tractable for therapeutic uses as their embryonic counterparts. Thus, they have not been found in a number of adult tissues, they are present in minute amounts in the body, and are very difficult to purify. In addition, they may not have the same differentiation potential as embryonic stem cells, being actually multipotent and not pluripotent. The vast majority of scientists therefore advocate the need to pursue studies both on embryonic and adult stem cells.

Nevertheless, the use of embryonic cells is hotly debated in many European countries for two main reasons. First, several groups oppose such use on philosophical grounds and second, bioethical laws have often not taken into account quickly enough the progress made in embryonic cell research and still ban all research using cells or tissues of embryonic origin save for research on infertility, often because of the fear of eugenics. Such was the case in France and Germany whose laws even prevented the import and use of embryonic stem cell lines developed abroad. Most countries are now modifying their legislation to authorize such research but important years of studies will have been lost.

What do we conclude?

First, while stem cell research shows considerable promise, much basic research still needs to be done before therapeutic uses can be realized. In particular, the actual mechanisms behind the cellular events that lead to cell differentiation are still poorly understood. The freedom to do basic research is in itself an ethical issue. In history, fundamental studies often went ahead against the will of the majority of the population – remember the first anatomists who had to hide in order to perform dissections of the human body. It was to avoid undue limitation of research that EUROSCIENCE[1] pleaded against restrictive amendments which had been put forward in the Fiori report on the ethical, legal, economic and social implications of human genetics, which was put to the vote of the European Parliament on 29 November last year and finally rejected.

Secondly, when ethical considerations are obviously at stake, a careful balanced view must be generated before legislation is passed. Indeed, one may argue that legislation will always lag behind scientific discoveries and therefore that, beyond clear ethical guidelines which correspond to our European philosophy and heritage, politics should abstain from establishing too rigid rules, possibly delegating to watchdog scientific and ethical authorities the responsibility of verifying that scientific studies do not trespass on ethical considerations.

There is no doubt that future discoveries will spur further heated debates in this field which holds both great hopes for patients as well as fear of biological manipulations. European scientists have an important role to play to put both aspects into perspective.

Frédéric Sgard

Résumé

Les récentes découvertes dans le domaine des cellules souches ont provoqué un débat important non seulement au niveau scientifique mais surtout sur leur impact d'un point de vue éthique.

Les cellule souches sont des cellules que l'on trouve au tout début du développement de l'embryon et qui sont capables de se différencier ultérieurement en l'ensemble des cellules de l'organismes. Cette capacité est à l'origine de leur intérêt thérapeutique potentiel: la recherche sur les cellules souches humaines pourrait non seulement aider à la compréhension des mécanismes de l'embryogénèse mais aussi être utilisée en thérapie cellulaire pour traiter des maladies causées par la destruction d'un certain type de cellules (maladies de Parkinson ou d'Alzheimer etc..).

Plusieurs problèmes éthiques ont été soulevé par ces recherches, concernant la peur d'utilisation de ces recherches pour le clonage d'êtres humains ou de la possibilité même d'utiliser des cellules embryonnaires et font l'objet de débats au niveau international. Il semble cependant important de rappeler que, malgré l'espoir que présente l'utilisation de ces cellules, de nombreuses recherches fondamentales restent à effectuer avant d'envisager leur utilisation à des fins thérapeutique.

[1] See EUROSCIENCE press release (27 November 2001) at www.euroscience.org.

The role of science associations in European integration

In July 1999 in Budapest, the UNESCO–ICSU World Conference on Science adopted. "The declaration on science and the use of scientific knowledge". Half a year later, the European Commission (EC) launched the most ambitious and visionary programme of the Union (EU) on European science – "Towards a European Research Area". The ultimate goal outlined by both of these is a knowledge-based society – the only alternative to fear, violence, prejudice, and global destruction. On the European scale integration is its vital part – integration which should help to build the knowledge-based society in a common Europe. This is the real goal for our continent in the 21st century.

European Partnership in Science

Europe can be justly proud of its scientific record of past centuries. Copernicus, Newton, Galileo, Medeleev, Maria Skłodowska-Curie, Einstein, – but also Archimedes, Heraklitos and Pythagoras. Europe can also be proud of being the home of many exceptional minds that left their own countries – even Europe – to conduct their research abroad. Some call it a brain drain. But travelling has been common for European researchers for centuries. Some left their motherland for life, as Maria Skłodowska-Curie did, but some, like Copernicus, returned, to mention just two of my well-known compatriots.

This is the first message I want to convey. *We must not be afraid of researcher mobility*. It is a great asset. But those who have power and control resources must beware of creating intellectual deserts in Europe. This dangerous process, which we are unfortunately witnessing now, must be stopped and reversed. Not by issuing orders or building obstacles, but by providing incentives and opportunities for the young and talented to return to their homeland.

The European science landscape is very rich. We have numerous governmental bodies, with the EC having the largest joint resources on the European scale. The voice of parliamentary bodies is of great importance. We have pan-European associations of the funding agencies and national research organisations, with the European Science Foundation playing an important cohesive role. We have the places where science is being conducted, with these universities, academies and industry also having their pan-European representative bodies. Thirdly we have the individual scientists. They also group into professional and disciplinary associations and organisations. All of these may truly contribute to the development of a common European Scientific Technological – but also Educational – Area. But there is one more which grows in importance – *the media*. Not because they grow more and more powerful, but because they can provide efficient bridges to society at large.

Complexity of Science – moral dilemmas

To answer properly the question of the role of each of these four layers requires a moment of reflection on change in science itself. Doing science is no longer a small individual venture. It is a costly multi-billion enterprise, conducted by over one million researchers across Europe alone. This means that new paradigms of the science–society relationship emerge. We must define a new societal contract, as now science and the scientists are responsible not only before God and science foundations, but – and primarily – to society.

Doing science is more of a mission than a profession

It is very easy to list the societal issues addressed by science. They include the environment and resources, health, culture and even religion. The scientist must not live in an ivory tower. There are real reasons for a growing distrust in science and its products. The most common concern is about unknown side effects. DDT was helpful to agriculture, but after some time quite dramatic side effects were detected. Chernobyl provided electricity, but also a horrible disaster. No one may guarantee the full safety of genetically modified organisms and all genetic engineering. But these dilemmas have always been with us. *Science is morally indifferent. But the use of its results and products is not.*

Scientists cannot be blamed for everything. *Everybody* – society, all of us – is responsible for everything. And this fundamental notion must be conveyed to society, and science associations can help in this. And this is an important task in the process of integration. It may be less political, but more moral.

One further point I consider very important. This is the right to failure. These days it is only success that counts. Quite often at any price. But doing science is rarely a story full of successes. Errors and failures are the essence of the scientific process. And if we are honest, we must tell this openly to those who provide us with resources for doing research. And this includes taxpayers. Paradoxically, the more we know, the larger is the horizon of the unknown, the untested, and the potentially dangerous.

These are the key reasons why science-related associations are such essential elements in the process of building a knowledge-based society – and also in the integration process.

We have to interact with and provide advice to society at large, to science policy makers, to science fund managers and to our science community itself. We must not only explain and warn. We should help in reaching a better and more stable solution. We have tools and vehicles to test new research proposals and new mechanisms of organising science and funding it. It is finally much easier for us to reach our colleagues back in the laboratories and ask for unbiased opinions.

All these dilemmas and obligations are consequences of the fact that doing science is more of a mission than a profession. Benchmarking and the use of science citation statistics cannot substitute personal responsibility and authority. We need wise masters more then ever, as ethical issues cannot be programmed into any computer algorithms. Hopefully.

Europe needs a grand vision: REI

Last summer a very important meeting took place in Brussels. Organised by the EC, it addressed a very relevant issue, particularly

for the Central and East European (CEE) countries. The subject was "An enlarged Europe for researchers" For me, not only a European scientist, but also a citizen of one of the so-called pre-accession countries – Poland – this was one of most fruitful and optimistic meetings I ever attended.

In his opening speech, EU President Prodi declared that all measures would be undertaken to make Europe the intellectual and economical leader during the next decade. And he stated that enlargement is a

Errors and failures are the essence of the scientific process

vital part of this task. He even named this challenge "a new European Renaissance". Yes, Europe needs a great vision. We at EUROSCIENCE greatly support and appreciate the philosophy underlying the concept of the European Research Area (ERA). Indeed, if Europe wants to use all of its vast intellectual capacities, it must be viewed as a whole. But such a grand declaration is only a first step. Appropriate measures must follow, and there is a lot to be done, e.g. in diminishing the quite disproportionate distribution of large research facilities, as well as the networks of large first-class research laboratories across Europe. And such a statement applies especially to the pre-accession countries.

The second issue is enlargement itself. It is a subject of a hot but sometimes humiliating exercise. The sooner we replace this issue by a discussion on a *common* Europe, the better, and for European science also. For we live on a *common*, not enlarged, European land. Soon we will have a *common*, not enlarged, currency. And we all have a *common* history, not enlarged by anybody, upon which we may build a lot. It is about time we stopped talking about the CEE countries *vs.* the West. By always contrasting these two geographical regions – also in science – a new but invisible Berlin wall is created, mostly via prejudices which will be hard to overcome in the future.

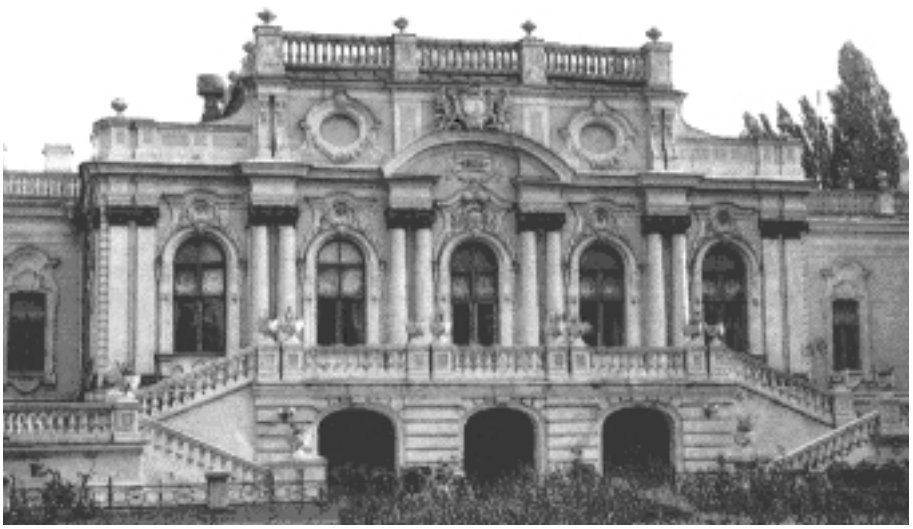
A third point is the educational and academic institutions in Europe. Science needs young talented people. They can come to science only via high quality scientific academic institutions. Therefore, in building up a vision analogous to the European *Research* Area, which we might tentatively call a European *Education* Area, we must start from common ground and seek a common purpose.

Higher education with its European 'Ivy League' of top universities can provide a good starting point. It coincides almost exactly with the top university-based research centres, so that the implementation of such a programme and the involvement of such institutions in building it up would be an entirely natural extension to the ERA.

There are tools available to the EC to foster this aim. These include the development of the education analogy to electronically linked research centres, substantial extension of the existing scholarship schemes thus creating a new Europe-wide openness, and the use of structural funds. In some cases, their use has caused tensions within the Union. However, better access to quality education for the young generation is of such over-riding importance that such use would be widely acceptable to everybody. If we dare talk about a network of European *laboratories*, why not about a network of European *universities*, funded partially by the EU resources, and partially by the member states?

Europe is on the move. How should it proceed effectively? We may find a good hint from the magic of ancient Greeks. Centuries ago Heraclitos said – παντα ρει – REI – quite appropriately for the European Area. *R* can stand for *research*, *E* for *education*, and *I* for *innovation*. The European Area built upon these three elements will not only be able to face challenges of the future, but it will assure our stability. We should do all we can to realise this grand vision of a common Europe.

Jerzy M. Langer



Résumé

Une nouvelle vision pour la science et la société en Europe au 21ème siècle est nécessaire: ce doit être une société de la connaissance rassemblant les pays du continent dans « une Europe commune ». Parmi les acteurs du paysage scientifique européen, – scientifiques, organisations de recherche, gouvernements et Parlements, media –, les associations de scientifiques jouent un rôle particulier en tant que pont entre la recherche et les questions que se pose la société, face aux mutations complexes de la science. S'inspirant de l'adage fameux d'Héraclite (panta rei), l'auteur donne un sens programmatique à REI : Recherche, Education, Innovation, qui sont les piliers de l'espace européen.

This article is based on the invited talk given by Vice-President Langer to the 2001 Conference on the Role of International Organisations in the development of a Common European Scientific and Technological Space. This meeting was held in Kiev, Ukraine.

IN TOUCH

The comet makers

On the occasion of the 2001 French 'Fête de la Science', and with the financial support of the Rhône-Alpes region, the EUROSCIENCE Léman section arranged the performance of 'Les faiseurs de comètes' (the comet makers), aimed at the public in the rural area surrounding Geneva. The play was inspired by the panspermia theory, according to which life on Earth originated elsewhere in the cosmos. Following the first performance, Claude Alain Roten, an exobiologist from the University of Lausanne and Stéphane Udry, an astronomer from the University of Geneva, debated with the public the present status of theories of the origins of life.

The authors/actors of 'Les faiseurs de comètes' are two scientists: Anne Gaud McKee (pictured), a molecular biologist from the University of Geneva, and Didier Raboud, an astrophysicist from EPF Lausanne. They are co-directing the 'science for the public' outreach vehicle of the University of Geneva that is dubbed 'Passerelle Science-Cité'. They believe that the artistic approach can used successfully to convey a message to the public on the ethical, philosophical and aesthetic aspects of science.

This was yet one more creation by Mimescope, a young theatrical company founded in 1997 by Anne Gaud McKee and Markus Schmid (an actor-mime). They make extensive use of shadows, mime, and body language. They have already produced plays on genetic engineering ('Manipuler n'est pas jouer') and particle physics ('l'Oracle de Delphi') which have been very well received by critics and the public alike. They are busily preparing the premiere of yet another play 'Le chant de l'étoile', on the cosmic origin of the chemical elements, which will open soon at the Théatre du Grütli, Geneva.

Robert Klapisch

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Dear Editor,

Professor Yuri Bandazhevsky, a well respected Belarussian academic, founder and Rector of the Gomel Medical Institute, has devoted most of his scientific work to examining the effects of the radioactive fall-out of the Chernobyl nuclear reactor disaster of 1986 on people living in the region of Gomel. He designed large-scale scientific research projects on the causes of the diseases afflicting the population residing in the contaminated areas, particularly the impact of radioactive emissions on children. He has often been outspoken in his criticism of the reaction of Belarussian authorities to the impact of the Chernobyl catastrophe on the population's health. After a trial in Belarus considered as unfair by the Advisory and Monitoring group of the Organisation for Security and Cooperation in Europe, he was sentenced to eight years imprisonment on 18 June, 2001. Amnesty International believes that his conviction is related to his scientific research into the Chernobyl nuclear disaster and his open criticism of the state authorities. He is detained at the UZ 15/1 penal colony in Minsk. His wife, Galina Bandazhevskaya, a pediatrician, stated that he is being held in a dormitory-cell with around 150 other prisoners, sleeping in three-tiered bunk beds and that his health is deteriorating. He can receive letters. News and support from the outside world are essential for him.

His prison address is Yuri Bandazhevsky, 220600 Belarus, Minsk, Ul. Kalvarijskaia 36, Boîte Postale 35-21.

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