

Investing in Knowledge in Europe

Reflections of ALLEA on the Proposals for the Seventh Framework Programme 2007 - 2013 of the European Commission

Preface

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

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

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

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Executive Summary

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

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

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

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

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

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

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

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

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

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

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

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

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

Introduction

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

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

General observations

Funding of fundamental and strategic research

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Administrative control and procedures for application and review

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

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

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

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

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

Frontier Research

Fundamental research

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

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

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

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

European Research Council

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

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

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

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

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

Competition and equal development

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

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

Research infrastructures

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

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

Human Resources

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

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

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

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

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

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

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

European Cooperation

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

Themes

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

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

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

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

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

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

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

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

Instruments for collaborative research

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

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

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

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

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

Co-ordination of national programmes

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

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

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

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

Joint technology initiatives

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

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

Other Issues

Science in Society

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

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

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

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

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

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

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

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

International co-operation

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

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

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

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

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

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

Intellectual Property Rights

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

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

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

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

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

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

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

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

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

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

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

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