



# **The Sum of the Parts: ALLEA and Academies**

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## Preface

ALLEA has occupied a substantial part of our lives during the five years in which we have held the positions of President and Vice-President. As a token of this, we have brought together in this volume our main articles and addresses on ALLEA issues, all of them in some way or another raising the question of the degree to which an organisation that brings together many diverse parts can achieve something that the parts alone cannot. Some of these papers have been previously published; some were originally intended for internal use only, but the opening article, which presents an overview of our thoughts on academies and on ALLEA, was written specifically for this volume. But because our involvement with the organisation and its members has taken place against the background of our own research, we hope that the reader will forgive us for having also included two papers which have nothing to do with ALLEA but reflect, in form and content, the opposite poles of the world of knowledge that we inhabit.

This has been a fascinating time to have been involved in ALLEA. There have been dynamic and sometimes surprising changes in Europe, in academies, and in the organisation itself. We have worked to the best of our abilities for the academic community, surrounded by wonderful colleagues and facing exciting events. We have tried to lead ALLEA in its efforts to become a recognised actor on the stage of European science and scholarship. The Strategy for the future has been tabled, and although it may look ambitious, we believe this to be the right way forward. But the debates will continue because at the moment of writing in 2011 there is no consensus within ALLEA concerning its development. Perhaps, as Albert Einstein once said, the most important thing is not to stop questioning.

We would like to thank all our colleagues from the Academies of Europe, whose activities have made ALLEA a vibrant and dynamic institution. Our special thanks go to the ALLEA Steering Committee, or Board as it is now called: the fertile and sometimes forceful discussions within the Board have helped to formulate all the basic ideas for action. Thanks are also due to everyone who has contributed to ALLEA business in Standing Committees, Working Groups and Task Forces. We greatly appreciate the role of those who have provided the venues

for our meetings, whether of the General Assembly, of the Steering Committee or of other ALLEA conferences and Workshops. We should also like to thank our partners in other organisations in Europe and worldwide for their fruitful cooperation. We single out three Academies for particular gratitude: our home Academies, respectively the Estonian Academy of Sciences and the British Academy, for their support, and the Royal Netherlands Academy for hosting ALLEA in the Trippenhuis, Amsterdam, and for its long-standing support for the organisation. But special thanks must go to Rüdiger Klein and Mirjam Bouter, whose unstinting devotion in the Secretariat ensured that ALLEA's work could be effective. Finally, we owe a particular debt to our families, who have patiently tolerated our long working hours and frequent travel on ALLEA's behalf.

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Autumn, 2011, Tallinn-Cajarc

**Part I**  
**ALLEA**



# **Academies, ALLEA and knowledge-based society**

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ALLEA

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## **Introduction**

This is an essay on the academies of Europe which have been strongholds of knowledge over centuries, and on their roles in our dynamically changing world. Both authors have long been active in our home academies, and were involved in ALLEA business for some time before ALLEA's members entrusted to us the Presidency of the Federation of **ALL European Academies**, with the roles of President and Vice-President respectively. In what follows, we set out our thoughts on the activities, results, visions, and future for ALLEA as they developed in the period 2006-2011, together with some very general considerations on science and scholarship.

Much of this is already history, but we also attempt to document a contemplative process. As prescribed in ALLEA's Statutes, one of us comes from the natural sciences and the other from the humanities, but we have consistently worked as a team. We trust that there is no competition between our views, that they reflect jointly the universality of academic endeavour; they may even express a balance between what in an earlier age C.P.Snow called 'the two cultures'. We must stress that the views expressed in this essay are ours and not the official position of ALLEA, even if from time to time we use excerpts from ALLEA documents. Some of the points developed below were set out in earlier texts or addresses for specific occasions, but here we attempt to paint a more general picture of the world of Academies in Europe, focusing on actions capable of having a general impact on academia and society at large.

## **Keywords**

Academies, values, identities, diversity, joint actions, knowledge based society, complexity, dignity.

## Academies – how they started

Much has been written about academies and their importance for science. A substantial volume was compiled to celebrate the 400<sup>th</sup> anniversary of the *Accademia dei Lincei* in Rome (Le accademie... 2003). Academies are traditional organisations, even if one of their tasks is to look forward and sketch the world of science to come. But in order to understand the present and envisage a road towards the future, it is essential to know the past. That is why in this essay we start with a brief outline of the history of academies following the overview published by Engelbrecht (2011).

The cradle of Academies was Plato's *Akademeia* in Ancient Athens, established in 387 BCE. It was, according to the terminology of that time, a gymnasium (an upper secondary school), whose aim was to teach young men to become philosophically educated civil servants (*sic!*). Out of seven gymnasia, Aristotle's *Lykeion* (founded in 335 BCE) was even better known than Plato's *Akademeia*. The names of both gymnasia have survived over the millennia, and are still used in many languages across the world. It has been said of Plato's *Akademeia* that it was strongly linked in to the political life of Athens. It would appear from the surviving records that the *Akademeia* advised rulers and the community at large on a number of issues; one might even conclude that the advisory role of Academies has a long history. It is also reported that there were cases where the *Akademeia* declined to discuss problems, but we do not know whether such refusals gave rise to sanctions of any kind. It is a constant feature of the intellectual life of Academies through the ages that the existence of independent and self-sufficient modes of thought has not always been to the liking of the ruling class, a feature that has, most deplorably, still not altogether disappeared in the present day. The *Akademeia* was closed in 529 AD on the orders of the Roman Emperor Justinian. Although in Rome the school of the *Akademeia* (that is, the people who shared its doctrine) was for long esteemed, the Emperor is alleged to have said: "No one is allowed to teach the philosophy related to Athens and to interpret the positions coming from Athens". From its very beginnings in Athens, the history of Academies abounds in phenomena which are not unknown today.

The teaching function of the *Akademeia* found followers elsewhere. A similar institution came into being in Alexandria, under the

protection of Ptolemy I Soter (367-283 BCE) and his son Ptolemy II. In or around 300 BCE Ptolemy I established the *Mouseion* next to his palace, with a large lecture hall, living quarters for the scientists and a library. This gave birth to the famous Library of Alexandria, which at the height of its splendour contained some six or seven hundred thousand manuscripts in many languages. Ptolemy II was renowned for inviting scholars to Alexandria. These included Euclid and Archimedes, and many others who would merit a separate article as participants in an early ‘visiting scholars scheme’. It is incidentally worth noting that in comparison with today’s practice of mobility schemes, the incoming scholars were not taxed. In the 21<sup>st</sup> century the new Bibliotheca Alexandrina, risen like the Phoenix from the ashes, is not only an architecturally resplendent and highly functional structure, but is also becoming a new centre for culture and research in the Mediterranean region.

There are sporadic records of the creation of Academies in the early Christian era and in the Middle Ages, notably in the 5<sup>th</sup> century in Constantinople under the aegis of Theodosius the Younger, and in the 11<sup>th</sup>-12<sup>th</sup> century in Georgia, where an empire uniting the tribes across the Caucasus region was established under King David II ‘the Builder’. The King favoured knowledge, and made use of the long-established monasteries to set up academic schools, probably the best-known of which was the Gelati Academy, which, as a second Jerusalem and a new Athens (Metreveli 2006), is perceived as the wellspring of the Georgians’ philosophical culture.

Throughout much of the Middle Ages, the bulk of knowledge was concentrated in the monasteries, while the outside world was locked in a constant combat for survival. The more enlightened rulers strove to promote knowledge and the fine arts, without however losing sight of their ultimate aim, which was to reinforce their own power. What were known as the seven liberal arts – the *trivium* of grammar, rhetoric and logic plus the *quadrivium* of geometry, arithmetic, music and astronomy – were particularly honoured at the court of Charlemagne in Aachen<sup>1</sup>. Scholars came there from many countries (international quest for knowledge being the norm then, and remaining so well into

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<sup>1</sup> In 1995, a grandiose conference was held “1200 years of science in Aachen” (see Bitzer et al. 1997/1998).

the modern age); discussions (which we might consider as conferences) frequently involved the emperor himself.

Academies in the modern meaning of the term took some time to emerge. It was only in the 15-16<sup>th</sup> century that their immediate forebears, the *Academia Platonica* in Florence and the *Academia Secretorum Naturae* in Naples, came into being. The homonymy should however not mislead us: these were primarily discussion groups rather than fully-fledged academies in the modern sense. The centres of knowledge in Europe were, at that time, the universities, and foremost among them those of Bologna, Paris, Oxford and Cambridge.

It was not until the 17<sup>th</sup> century that the first of today's working academies were established: the *Accademia dei Lincei* in Rome in 1603, the *Académie Française* in Paris in 1635 (and under its aegis the *Académie des Sciences* in 1666), the *Deutsche Akademie der Naturforscher Leopoldina* (called the *Academia Naturae Curiosorum* until 1687) in the free imperial city of Schweinfurt in 1652 (transferred to Halle in 1878), and The Royal Society in London in 1660. Some academies experienced trials and tribulations in the 18<sup>th</sup> century, otherwise hailed as the age of the enlightenment (and others again suffered during the Second World War). Yet there was a growing perception that Academies were needed as promoters of scientific thought and as assemblies that epitomise the accumulation of knowledge in the lands under any benevolent ruler. This is clearly indicated by the creation of numerous Academies during the 18<sup>th</sup> century that have remained in existence ever since, such as the *Kurfürstlich Brandenburgische Sozietät der Wissenschaften* in Berlin (today the *Berlin-Brandenburgische Akademie der Wissenschaften*) the *Gesellschaft der Wissenschaften* in Prague in 1700, the *Real Academia Española* in Madrid in 1714, *Российская Академия наук* in St. Petersburg in 1724 (nowadays with its administrative centre in Moscow), and the *Kungliga Svenska Vetenskapsakademien* in Stockholm in 1739. Such a list, which is not exhaustive, of course says nothing of the contributions to the history of science or of the broader intellectual activities of these institutions.<sup>2</sup>

One of the recurrent patterns in the scholarly activity of Academies is the presentation, by members to their fellows of the results of

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<sup>2</sup> A good overview about the history of the older Academies is available in the above-mentioned proceedings of the conference held at the *Lincei* in 2002 (Le accademie... 2003).

their research, whether in oral or written reports. It fairly soon became wide-spread practice to record those results in the proceedings of the Academies. This is how the “Proceedings of the Royal Society of London”, the “Transactions of the Royal Society of London”, the “Comptes Rendus de l’Académie des Sciences de Paris”, and the “Proceedings of the National Academy of Sciences of the United States of America (PNAS)” were born. These have always been high-level scientific publications which need no introduction here, and which are the flagships of their respective Academies. This long tradition continues, and the seal of the Academy upon its publications is a guarantee of the quality of the scientific results, testifying to the world-wide application of the practice of peer-review.

### **The present day life of the Academies**

What are academies today? Paraphrasing a famous quotation about roses, one could say: academies are academies are academies ... With their elected members being the foremost scholars and scientists of every nation, they are strongholds of knowledge in the most general sense of the word. With respect to other institutions and forces in society, their main assets are independence, excellence and authority. These hallmark characteristics of academies are also evoked in numerous ALLEA statements which list the multiple facets of academies: they unite top scientists; they advocate excellence in research; they issue statements on the basis of scientific evidence; they advise governments and society etc. Many academies have also developed into large research performing organisations, running numerous world-class research institutes. Last but not least, one might add that they are also cultural institutions, since all their activities, including the conduct of research, contribute to human culture and civilisation.

If these threads are common to most academies, we must also recognise that the mission of every national Academy is to serve its country, and that consequently its actions are very much shaped by the traditions, history, educational system, economic conditions and perhaps above all by the degree to which knowledge is valued by society in the country in question.

We all know about the diversity of Europe, encompassing as it does large countries and small countries, the leading G8 nations and the emerging economies, richly diverse cultures, languages, landscapes,

and above all ideas. Academies quite naturally reflect that diversity: a range of institutions from learned societies and think-tanks to research performing academies, grant-givers and capacity builders. Thus despite their many similarities, there is no academy exactly like another. Their status in their own countries may differ widely. Some academies have strengthened their status over the centuries, often with great effort, others, in much younger countries, are still making their way. But one cannot generalise: Leopoldina, as one well-established Academy with a long history only achieved the status of National Academy a few years ago, and in the complicated federal landscape of today's Germany is still working towards general acceptance of this fact. Some academies have managed to secure independent funding over the years; others depend primarily on government for funds, and have constantly to fight in order to maintain the level of funding, especially in times of crisis such as the recent one. Some academies ask fellows to pay a subscription; others pay fellows for their work. Some academies bring together the leaders in the (natural) sciences in the Anglo-American sense, some in the wider sense of German *Wissenschaft*, some in the social sciences and humanities only, some include the visual and performing arts. And the list of knowledge-related institutions operating under the aegis of academies in addition to institutes performing research is equally long and diverse: publishing houses, libraries, museums and institutes of advanced study, to name but a few. In the last ten years, some Academies have established "Young Academies" – while others are reluctant to embark on such a course of action. This all reflects the diversity of knowledge, and the many different ways of fostering the pursuit of it

How does one recognise a strong academy? Clearly the most important element is the members – top scholars and scientists – and the research that they conduct, whether as part of the mission of the research performing academies, or in the context of special academy-led institutions such as Institutes for Advanced Study, or on their own account in universities and other institutions. Next comes the organisation of the academy's work: its meetings, committees, statements, and a multitude of activities reaching out beyond academia proper to society at large, for which a dedicated staff is needed, as well as the support of special units for analysis and projects. Finally there is the public role of academies, first and foremost in publishing and disseminating knowledge, but also in promoting the very quest for it through the awarding of prizes, medals and in many cases grants. These social actions, like

the advisory function mentioned above, are of great importance, as are the international links and representative functions that connect national academies with the wider world, and that allow them to make the universality of science a reality.

Different organisational structures have emerged in countries where there is more than one national academy. A division by disciplines or fields of research is possible: under the umbrella of the Institute of France, for example (or more properly under its cupola), there are five Academies; the Institute of Spain brings together as many as eight, in addition to many associated regional academies. Smaller regional academies, or academies in different fields, have formed associations, as in Germany, Switzerland and Finland. Here again we encounter the inherent diversity of Europe: naturally the German concept of a 'region' is quite different from that in Estonia for example! In Italy, no strong association has been formed to rival the *Accademia dei Lincei*, but the traditional academies of the Italian towns and kingdoms are still the bearers of the scientific spirit in many regions. In a certain sense the multiplicity of Academies reflects the historical experience of larger countries, as much as it shows differences of professional roles. The Institute of Spain for instance, includes Academies (we omit the title of Royal that they all bear) of language (the Academy of Spain), of History, of Fine Arts, of Exact and Natural Sciences, of Political Sciences, of Law, of Medicine and of Pharmacy. In some countries, such as Sweden or the UK, the different academies (for the sciences, social sciences, humanities, engineering etc.) remain separate without an umbrella organisation, but function in parallel and often act jointly.<sup>3</sup>

Given all the adaptive diversity of fields and structures, and despite their broadly similar mission to support research – Ariadne's thread for humanity on its long road to knowledge about the interconnected worlds of nature, society, technology and the individual – the question arises whether academies are equipped to face an ever-faster changing today and an ever more uncertain tomorrow. If it is true that experience breeds confidence, academies should be confident: they are certainly very experienced because they unite the best brains. But since contemporary scholars and scientists, even if they no longer stroll in olive groves chewing over philosophical issues, but instead work

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<sup>3</sup> The profiles of many academies have been included over the years in ALLEA publications and are now collected and regularly updated on the ALLEA website.

tirelessly in their laboratories, feel the responsibility for enlarging our knowledge, they also have to learn to convey uncertainty with confidence: often the border between what we know today and what we shall know tomorrow is fuzzy. Or, as Carl Sagan put it, “Because science carries us towards an understanding of how the world is, rather how we would wish it to be, its findings may not in all cases be immediately comprehensible or satisfying”. Sometimes it takes courage to step over borders; sometimes when communicating science to society at large one needs to think beyond the temporary stresses caused by incompetent behaviour, sighing exasperatedly with William Shakespeare, “The time is out of joint”. Academies, with their wealth of accumulated knowledge across all fields, have an enormous potential to analyse the complexity of the world. As has been shown in the recent debates about expertise in the field of climate change and adaptation, it is the duty of academies to seek to understand the hidden mechanisms of nature and society, but also to pinpoint predictability and unpredictability, to create new knowledge, and not least to inform society about uncomfortable truths and to outline the possible choices that it is facing.

Academies have always been open to change; if they are strong, they are themselves the first absorbers of novelty of insight and approaches. Reflecting on the changes in the research landscape in Europe, several research performing academies have restructured their specialised institutes in order to focus their research activities in the best possible way. Often this has meant mergers with state-run research institutes, as in the Netherlands or in Austria, or with university institutes, as in Estonia. ALLEA itself was involved in 2009 in the very large-scale evaluation of all research institutes of the Bulgarian Academy of Sciences, which has led to the restructuring of priority lines of research in that country. In a similar way, academies are all paying attention to the needs of early career researchers, who are the future of scientific research in all countries; this support can take the form of Young Academies, or of associations of young researchers, or of special grants for the next generation of scientific leaders, or of prizes for early career achievements<sup>4</sup>. A growing number of academies also engage with the

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<sup>4</sup> Much about the activities of academies can be learned from their publications or webpages; of particular interest are the anniversary volumes, whether the anniversary

very foundation for the future of science – the reform of science education.

### **The world of knowledge, networks and institutions**

We live in a dynamic world where all constituent parts are linked with each other, and where changes occur on differing time-scales. Nature, social life and man-made systems as a whole and their interactions may properly be described as complex; in the words of I. Prigogine (1980) “the world is far too rich to be expressed in a single language”.

To understand the world with all its changes and to predict future changes is an essential task for the good of mankind. It is the proper task of the natural sciences, the social and the human sciences. The Declaration of the World Congress of Science in 1999: “...science is a powerful resource for understanding natural and social phenomena, and its role promises to be even greater in the future as the growing complexity between society and the environment is better understood” (Declaration... 1999) presents one point of view. But if we are to enlarge our knowledge in order better to understand life and matter, if we are to confront the Grand Challenges that face mankind – health, poverty, natural hazards, climate change, technology etc. – and if we are to penetrate the growing complexity of the workings of society itself, we also increasingly need the methods and insights of the humanities and social sciences.

Complexity studies can help to understand the task that is before us. Based on nonlinear dynamics, and principles such as self-organisation, hierarchical structures, etc (see, for example, Érdi (2008); Nicolis, Nicolis 2007) complexity studies involve physics and chemistry, bio-systems and computer science, social systems, economics and finance and so on. Understanding the relevance of such a holistic approach is not new: the ancient Greeks, and many thinkers over the intervening centuries, indicated the need to tackle problems in such a holistic way (see the collection of essays edited by Juarrero and Rubino (2008)). Many of those insights were presented ahead of their times, and it is perhaps only now that we begin fully to understand the contributions of

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is measured in centuries or in decades. The ALLEA Yearbook 2009 has documented in detail the support of Member Academies for young researchers].

Immanuel Kant, John Stuart Mill, Charles Sanders Peirce, Henri Poincaré and others who described the complexity of the world. Despite the fore-sight of these pioneering thinkers, it was probably the very success of the scientific method that made us take so long to adopt a more holistic approach in our research framework. A good explanation for this delay was advanced by A. Toffler (1984): “One of the most highly developed skills in contemporary Western civilization is dissection: the split-up of problems into their smallest components. We are good at it. So good, we often forget to put the pieces back together again.” Now at last there is a clear understanding that the pieces must be put together again – and the Academies, as the traditional environment for interdisciplinary exchanges and networks, reveal themselves to be the kind of platform for novel approaches that they had always been.

As assemblies of the best scientific minds in all nations, Academies are often called upon to develop an understandable vision of imminent and medium-range scientific and related societal developments. For another important issue in research is that, given the scale of the problems to be tackled and the centrality of the needs of society to be satisfied, and alas also the often very strict limits on funding, strategies for choosing investments in research have come to play an ever more essential role in structuring the evolving landscape of knowledge. It is evidently in the interests of Governments and of society to rely on eminent scientific advice in setting clear priorities: after all, tax-payers’ money must be spent transparently. Any strategy can only envisage the general fields of science, and it is the role of scientists to look forward in their respective fields. Serendipity may certainly help (consider the stories of penicillin more than half a century ago, or more recently of graphene) but experts are called upon to foresee trends and to envision possible pathways of progress. Academies have often been assigned this task in national contexts, for example in Slovakia; at European level, the European Science Foundation has during the last decade elaborated several so-called forward-looks on topics ranging from for instance nanomedicine and nanoscience, industrial mathematics, systems biology, global change, all the way to the issue of transcultural identities. These Forward Looks have often involved Academy delegates and are all characterized by deep analysis of the status quo – in society – and the sketching of possible future perspectives and requirements. The reports acknowledge that while it is certainly impossible to predict

discoveries, the fields where research might move the frontiers of knowledge can be marked out. Closer to political decision-makers, the European Academies Science Advisory Council offers, on the other hand, scientific advice to be used when political choices are to be made. ALLEA, by contrast, reflects on (and offers advice on the improvement of) the framework conditions under which the best possible and most relevant research can be conducted in Europe and beyond.

Scientists are aware that over-complicated strategies, demanding too many deliverables and depending for progress on simple indicators, may not actually produce the desired results. There is often a mismatch between the political rhetoric – take for example the 3% R&D funding target for the EU fixed in Lisbon and Barcelona – and budgetary decisions. Announced in good faith, the target has not been met since actions by the very same governments did not allow the average civil R&D spending across the EU to grow beyond the threshold of 2%. With Vision Europe 2020, the 3% target is restated, but now, in 2011, one year into the process and with the whole world barely recovering from a deep financial and budgetary crisis, the likelihood of reaching this target is already in doubt. The main attention in EU science policy discourses is now focusing on innovation. Again, the idea is welcome, as it could place R&D investments at the centre of EU and national policies, but without actions and changes in rules (for example in intellectual property rights) these new goals may not be achieved. The recent EC Green Paper on a Common Strategic Framework for Research and Innovation Funding (2011) launched a structured debate about the necessary framework conditions. Most Academies were concerned that the paper, while it strongly emphasizes a fairly simple image of transitions from research to innovation, does so to the exclusion of the social sciences and humanities. ALLEA proposed that these disciplines too should be harnessed, because without profound transformations in society and values at large, there can be no successful turn towards an innovation culture. By the same token, the most important asset in the construction of the world of knowledge is education, including science education, from the primary level right through to doctoral studies. This need has been well understood in many countries in Europe and worldwide and appropriate action is being taken.

In organizing research at the highest level, however, there are two main issues to be considered. The first is academic excellence which is

an indispensable component in every field and branch of research. The stories of the Nobel awardees or of the famous universities worldwide speak for themselves in this respect. In Europe, from its very beginning the European Research Council (ERC) established excellence as a key requirement for successful grantees, and, as a second criterion, ambition. The results obtained by the ERC grantees are encouraging. But the best minds also need good conditions for their activities, and this gives rise to the second main issue – that research structures must be well organized and the infrastructures in general must be maintained and expanded at the pace at which science evolves. To some extent, this need has been understood by policy-makers: good examples can be found both nationally and internationally. Many international centres and networks of research like CERN, ESO, and EMBO etc. already have a long history and have yielded excellent results. Strategic approaches such as ESFRI have been launched to involve national investments in the construction of a solid base of infrastructures.

There is however another figurative aspect of research structures which we can best be explained with notions of complexity – in this case self-organisation and fractality. Let us expand upon this idea a little.

It has long been held that structural strength is based on a strong foundation: the wider (and stronger) the foundation, the higher (and better) the structure. Pyramids are one example of structures that have resisted more than 4,000 years of changes around them. By analogy, research systems in many large countries can be described in the same way: the sheer size of a large foundation is likely to produce remarkable results. But is a broad foundation the only basis for building high-quality research? Or would a matrix description of the self-organizing forces of research activity, arranging for example at the most simple level the reasons and results into a system of rows and columns with every element showing the strength of interactions, and then up-scaling to higher dimension, not offer a manageable view of a complex system of interactions and hence avoid the science policy tools of the Procrustean bed, where all differences are forced to conform to a standard? The question however arises with predictable regularity: who is authorised and able to assume the role of Theseus in order to complete such standardisation?

A further advance is to use the concept of fractals instead of regular matrices (Engelbrecht 2006). Roughly speaking, fractals can be

described as networks where links between the elements are irregular and every element, if enlarged, has an internal structure with more links which are not visible at first glance. Such a fractal network may be useful to explain interdisciplinary, interregional, international and inter-societal interactions within research and also within society. A stronger element (laboratory, centre, university) would lead to more and stronger links that could serve to transmit ideas, increase potential, enhance internal structures, transfer funding to others, and so on. Such a model could capture the dynamic character of a network: intensive outflow of resources could destroy an element (a node), elements could be united, elements could grow dynamically, etc. Some elements could be attractors and therefore more visible. A good example of such fractal networks is given by the Royal Society's recent analysis of global scientific collaboration (Knowledge... 2011).

Another important analogy from fractal structures is that complex structures may be built from simple rules (Érdi 2008; Nicolis, Nicolis 2007). The application of these rules to research systems is really simple: support quality, support young people. If these rules are applied steadfastly, the world of knowledge can be built.

One important aspect that remains to be discussed here is the evolving nature of science-society relations. Following J.Lotman (2001), the manifolds of society and science are partly overlapping. Extreme situations – where the manifolds are separate or the manifold of science is fully within the manifold of society – are not acceptable. In the first case science would exist in an ivory tower, cut off from the needs of society, and yet de facto relying on its support – a situation that would not be sustainable in the long run; in the second case science would merely fulfil the wishes of society like a design bureau, and would be isolated from its own dynamism – an equally unsustainable situation. The sustainable constellation is that part of science functions following its own internal logic for moving the frontiers of knowledge according to the wisdom of scientists, while another part of science focuses on problems facing society. According to Lotman (2001), the most important problem is building lines of communication between the parts that do not overlap. Society must understand the aspirations of science, must trust scientists, and understand the potential long-term benefits accruing from science for science's sake. The balance between the parts is complicated, it is time-dependent, it is related to funding

possibilities and, perhaps first and foremost, it depends on the education of society, on science literacy.

Discussions in times of crisis, as in 2011, have shown that in order to achieve and maintain a balance, strenuous efforts are needed on both sides. While all agree that Europe and the world should move towards a knowledge-based society, the interpretation of what a ‘knowledge-based society’ is and requires may vary. In an ALLEA policy paper on the European Research Area (Challenges... 2007), the main characteristics of a knowledge-based society are set out: (i) knowledge is a prerequisite for the quality of life and welfare of society; (ii) knowledge is based on good education and well-organised research structures; (iii) knowledge is disseminated fast and there are equal possibilities for everyone to obtain information; (iv) links between academia, society, industry and government are well-organized; (v) a knowledge-based economy uses all the potential of scientists and scholars, engineers and other specialists; (vi) innovation is encouraged at every level including industry-academia collaboration, social welfare, fiscal incentives, etc.; (vii) knowledge is a basis for policy decisions in society; (viii) dialogue between science and society is promoted.

It seems however to be a real challenge for the nations to make the necessary long-term commitments to move towards a knowledge-based society. It may also be that a ‘new Renaissance’ in Europe – a recurrent term in recent policy papers – is not sufficient: should one not think more in global terms?

### **ALLEA – a brief history**

The modalities of co-operation between Academies in Europe have been intensively discussed ever since the beginning of the 1990s. This was the period when the European Union started to pay more attention to science and higher education. The main points of common interest were the role of Academies, the advisory function of Academies, the sharing of information between Academies, and the fostering of scientific and scholarly co-operation in Europe. As the logical result of these discussions, on the initiative of the French Academy of Sciences, the Royal Society of London, the Royal Swedish Academy of Sciences and the Royal Netherlands Academy of Arts and Sciences, ALLEA was

officially launched in 1994. A Charter was adopted which stated the goals of the network and regulated its structure. The goals included exchange of information, mutual advice, common activities, advancement of science, and development of science policy – very much following the mission of National Academies but raising them to the European level. The General Assembly is the highest body in the Federation, with the President and the Steering Committee (now Board) being responsible for activities in between the GA meetings. A European Academies Clearing House, located in London at the Royal Society, was a working organ for providing a channel to ensure the flow of information between Academies.

From the beginning of ALLEA's official existence, its working groups issued position papers on a number of questions: Basic Research in Society (1996), Research Training and Higher Education in Europe (1996), Science and Ethics (1999), etc. From 2000 on, a permanent office was established at the Royal Netherlands Academy of Arts and Sciences thanks to a financial subvention from the Dutch Government; ALLEA's organizational structure was subsequently consolidated, so that it is now a legal entity under Dutch law. Two Standing Committees were created, on Science and Ethics and Intellectual Property Rights; these are semi-permanent bodies concerned with issues important both for the academic community and for society. Working Groups of limited duration were created to deal with specific issues of science policy and advice, such as "Research cooperation", "Science and the media", "Privacy in the information society", "Evaluation for science" and, most recently, "Science Education". These Working Groups reported to the General Assembly, and, after approval their reports were published and disseminated. It became, clear however that greater focus was needed in order to distinguish advisory activities in two different but complementary directions: science for policy and policies for science. That is why some EU science academies decided in 2001 to create the European Academies Science Advisory Council with the goal of providing scientific policy advice for policy-makers at EU level. Currently the Council comprises 23 individual delegates from European Academies, plus the presidents of ALLEA and Academia Europaea. Its working groups produce reports on issues in energy, biomedical sciences and the environment. ALLEA on the other hand focuses on policies for science. Its activities in this area have also grown significantly since 2000. ALLEA has contributed

(on its own or jointly with partners) to the formulation and distribution of policy statements and advice on such issues as the “Importance of fundamental research”, the need for a European Research Council, the challenges of building successive Framework Programmes (“Reflections on FP6” (2001) and FP7 (2005), One important document at the beginning of the 21<sup>st</sup> century was the “Memorandum on scientific integrity” (2003) issued jointly with Dutch organisations, and subsequently developed into the European Code of Conduct for Research Integrity (2010). If we cast our minds back to the ideas of the founding fathers of ALLEA and the goals formulated some 20 years ago, we can see that academies have joined voices in many respects.

ALLEA has grown from a loose network of academies, whose purpose was to facilitate biennial general meetings, into an organization that is sought by its members, the European Commission and other partners inside and beyond Europe for advice and guidance in all matters relating to the interface of science and society.

At the time of writing, in 2011, ALLEA has 53 members from 40 European countries, reaching out through its membership well beyond the European Union. A more detailed history of ALLEA from its inception to 2005 is set out in “History and Development, ALLEA Document (1)” (ALLEA History... 2005).

### **ALLEA in 2006-2011**

This is the period in which we have both been most actively involved in ALLEA activities, and about which we are most qualified to write. It is an honour to follow in the steps of the former Presidents Professors Paul Germain, Domokos Kosary, Gerhard Gottschalk and Pieter Drenth who previously steered ALLEA. Rather than describe the activities of ALLEA over the years which have been documented in annual or biennial Yearbooks, we shall attempt here to characterize organisational changes, to highlight actions and explain the ideas developed. That will lay the basis for the discussion of options for developments in the next Section.

#### ***Issues of governance***

First, a brief account of the organisational progress of ALLEA over the past five years.

We started in 2006 with the adoption of new statutes that introduced a presidency composed of President and Vice-president, a com-

bination also intended to achieve a balanced reflection of the sciences and of humanities and social sciences in ALLEA's work. The consolidation of everyday work in the office was the first priority in order to enhance the flow of information and strengthen the ability to act in responsive mode. This involved some straightforward measures such as a register of correspondence and the practice of writing and putting on record of memoranda from every meeting attended by representatives of ALLEA, at that time primarily the President and Vice-President. Annual action plans were formulated, and the team work between the Presidency and the Steering Committee began to develop. In 2008, the part-time executive director of ALLEA – a researcher employed by KNAW retired. It was decided that his successor should be selected from an international pool. It was the shared view of the Presidency and Steering Committee that ALLEA needed an active officer familiar with European science policy and able to formulate joint opinions and represent the views of academies to other stakeholders including the European Commission. An Identification Committee was formed, a call brought over 30 candidates to our attention, five of whom were short-listed and interviewed; we were efficiently assisted in the selection process by the KNAW office. The IC unanimously decided to offer the position to Dr Rüdiger Klein, whose expertise on science policy in Europe has greatly strengthened the ALLEA team since 2009.

The next period 2009-2010 could be characterised as a second start: the President and the Vice-President were re-elected for a second term, and the office had a new head and a new experienced secretary. The flow of information was enhanced by the creation of a functioning website and an electronic quarterly newsletter; the materials for the Steering Committee and Standing Committee meetings were professionally prepared, and new activities were initiated. We shall touch on some of these below, but the most significant at this time was the preparation of a new Strategic Plan for ALLEA. The previous one for the years 2008-2010 (ALLEA Strategy... 2008) was a short document of 5 pages, and reflected our collective view in 2007. Every well-functioning organisation must have a Strategy, and the debates as to what it should include, and what not, are an essential preliminary to the document in which it is enshrined. It is said that a good Strategy should be so ambitious that there will be many voices against it. But in our case the main driving factor behind the new Strategy were the rapid changes in European science funding and higher education. Equally important,

as had already been discussed at the General Assembly in 2008, was the need to change our funding mode to an annual budget the core of which would be fully based on membership dues. The ALLEA office and many of the organisation's actions had been supported for many years by a subsidy from the Dutch Government through the KNAW budget. This single-source funding was not sustainable, and as early as 2008 discussions on an alternative mode – essentially a membership-fees scheme – had begun at the General Assembly in Madrid, fuelled by the KNAW's decision to end its support in 2012.

Finally, the year 2011, which might be characterised as a year of important decisions. Although the new Strategic Plan was formally approved by the necessary majority of members, a number of influential academies were reluctant to agree to it, and in addition the global financial crisis meant that many academies faced difficulties in meeting the membership-fees requested of them for 2012. After a series of discussions it became clear that the determination of the Presidency and the Steering Committee (now the Board) to move towards an ambitious inter-academy organisation was not whole-heartedly shared by the members, and was therefore not viable.

Under those circumstances, we felt that we did not have the confidence of the member Academies and consequently decided to step down as President and the Vice-President before our mandate ended in 2012. Presidential elections were announced, and the new President is expected to be elected later in 2011. Our intention in precipitating this change was that ALLEA could start the year 2012 with a new team capable of defining new conditions for the future of the organisation.

After this brief overview of governance issues, we shall now focus on some highlights of ALLEA's actions over the full period of 2006-2011.

#### *Science policy principles and statements*

The principles for ALLEA's work as a Federation until 2006 were originally formulated by the 1998 Review Group and by the Steering Committee in 2005 (ALLEA History... 2005). In general terms, the primary sources for action were to be bottom-up proposals from the membership, but the question frequently arose as to whether a more centralised strategy was called for. This Presidency took up the challenge of designing – through lengthy consultation with all the members – such an overarching strategy, not because of any wish to

centralise the governance, but because of the rapid changes in the environment, and the need to create a clear image of the role of Academies. The concept of the ERA and the rapid evolution of Europe simply imposed the need for swift reactions from all stakeholders including academies and ALLEA on their behalf.

ALLEA had agreed with its partners at the Workshop “European Organisations on Cooperation in the ERA”, held at The Hague on 15 December 2006, on possible actions, and on principles that would underpin progress towards a knowledge-based society; they were

- only a world-class research environment can guarantee progress towards the goals of Lisbon and Barcelona;
- there is a need for a political will to develop ERA but this will must be fed by the community;
- education at all levels including that of policy-makers plays an important role;
- the self-organization of research communities should be encouraged;
- for scientists, sustainable career-paths are important, and should include return, promotion, open opportunities, etc.;
- in a competitive and dynamic world, research organizations should clearly define (and redefine, if necessary) their role and targets;
- regional partnerships should be strengthened by clusters of European and worldwide co-operation;
- the effectiveness of programmes should be enhanced with attention to their ‘pulling’ effects;
- attention should be focused on dismantling the barriers in research (barriers between the Member States, different schemes, etc);
- public and private partnership in funding schemes and joint programmes should be supported.

Against this background, and after many discussions in the Steering Committee, ALLEA published its first strategy document in 2008. It describes the mission, vision and position of ALLEA and lists its modes of action (ALLEA Strategy... 2008). The final part of the document states how ALLEA will promote the Europe of knowledge by:

- issuing science policy analyses and statements and supporting Pan-European joint activities;

- developing opportunities for cooperation between academies including cooperation at regional level;
- promoting the development of the ERA and stressing the role of excellence in research;
- developing joint activities with other partners striving for excellence and research integrity;
- promoting together with its partners public awareness and understanding of scientific issues;
- aiming to set international values and standards in collaboration with partners;
- developing a role in the process of evaluation for science;
- developing a service to keep its members up-to-date on developments in science policy in Europe and worldwide;
- enhancing the exchange of information between its members, especially on science policy and advisory issues.

In parallel policy analyses and statements were produced that bring the joint opinions of academies to the Pan-European level. If in the previous period, ALLEA had analysed FP6 (2001) and FP7 (2005), it issued three policy documents about EC funding frameworks in the period 2006-2011:

“Challenges of the Future: Reflections of ALLEA on ERA” (2007);

“Reflections of ALLEA on the EC Green Paper 2007” (2008);

“ALLEA Position Paper on the EC Green Paper 2011” (2011).

All these documents were accepted by the Commission services with appreciation, and each led to increased intensity of exchanges with the relevant directorates and Commissioners. There is no need for extensive comment on these texts, but some important issues may be mentioned.

The first document described the ERA as the embodiment of a knowledge-based society, and explained the role of ALLEA and of the national academies in it. At the time, there was a clear sense that the ERA provided a general policy context for the principles that had inspired ALLEA activities since its inception. This subsequently served as a basis for further debates on ALLEA strategy.

The second document stressed that although the EC’s Green Paper touched on many important problems, it lacked any emphasis on the essential question – why research? There is passage in the ALLEA document, which we have since used in many of our statements, to the

effect that research matters! “Research not only contributes to innovation and to economic development; it is about man, society and the world, about culture and human perception, about inquiry into phenomena, it is a response to societal problems, to natural hazards and to climate change, a way of improving health and education ...”

The third document, which is the most recent one and reflects on the plans of the Commission for a “Common Strategic Framework for EU Research and Innovation Funding”(2011), focuses inter alia on two issues: (i) “The CSFRI must embrace all stages of this process [i.e. leading towards innovation], wherever they do, can or should occur, from creativity-oriented and inquiry-minded education, through basic research and discovery to valorisation and further ... to market creation”; (ii) concerning Grand Challenges (ageing, climate change, energy, food security and transport), “ALLEA urges that an independent sixth challenge is recognised that deals with topics for which SSH (social science and humanities) expertise is central”. The 2011 position paper benefited greatly from exchanges in the newly established European Academies Task Force on Science Policy.<sup>5</sup>

It is encouraging that the linkage between basic research and social sciences is also recognised outside the ERC: often we find that such funding occurs where Europe needs better understanding of the complexity of human systems. One example is FuturICT ([www.futurict.ethz.ch](http://www.futurict.ethz.ch)), under the FET Flagship Pilot Programmes, which builds on the thesis that understanding socially interactive systems is one of the greatest and most urgent questions to address in the 21<sup>st</sup> century. FuturICT proposes to study the principles that keep a social system together and hopes to create a renaissance of social sciences.

#### ***Advisory bodies: Standing Committees and Working Groups***

The two Standing Committees of ALLEA – on Science and Ethics (SCSE) and on Intellectual Property Rights (SCIPR) form a significant part of our trademark. Rather than give a full account of their activities, we confine ourselves here to some highlights.

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<sup>5</sup> All ALLEA position papers are accessible via the ALLEA website, including, for the most recent one, substantial background information: basic documents, submissions of academies to the joint documents, national position papers, position papers issued by partner networks, earlier papers on FP8, and materials concerning social sciences and humanities.

The SCSE meetings and documents all attract the close interest of the scientific community, and of policy makers. After its pioneering work on research, and given the significance of questions of research integrity in the globalised world of science, SCSE speakers were invited to speak at the 1<sup>st</sup> World Conference on Research Integrity (Lisbon, 2007); at the 2<sup>nd</sup> World Conference (Singapore, 2010), ALLEA presented the European Code of Conduct on Research Integrity, prepared jointly with the ESF under the guidance of P.Drenth (The European Code... 2011). This document builds on the earlier ALLEA “Memorandum on scientific integrity” (Memorandum... 2003), and emphasises the central role of academies in raising awareness on the issue. An ALLEA conference volume on “The Ethical Commitment of Scientific and Scholarly Academies” (2007) spelled out some of the bigger challenges, a number of which were subsequently picked up during a working meeting of the Standing Committee held in Istanbul in 2008 (proceedings published in 2009).

Two further important issues dealt with more recently by the Standing Committee should be emphasised: the commitment of academies in introducing ethics as a part of research training (SCSE workshop, Oslo, 2010; statement and recommendations to be published in 2011) and support for research and higher education in Palestine (SCSE meeting, Oslo, 2010). Ethics should be an integral part of education, so that the younger generation, as they enter an extremely competitive world, may be aware of the ethical problems that they will face during their careers and thus be able to avoid the pitfalls. And it goes without saying that the road to knowledge must be open to all, and that political differences of opinion should not be allowed to overshadow education and research.

The SCIPR dealt with numerous significant topics, ranging from Open Access and international patent law to issues relating to human embryonic pluripotent stem cells and policies on the digitization of books. Especially important is a statement on the future patent system of the European Union. This statement supports the creation of a unitary EU patent, explains its significance and encourages the EC to relaunch the efforts aimed at introducing a grace period similar to the one existing in the US. Elaborated by leading specialists, the proposals of the SCIPR are of considerable value for the ERA, and are commented upon by the relevant scientific, legal and political environments.

Another specific ALLEA tool is the temporary Working Group, set up to deal with current problems for which the scientific community and society at large need solutions. In 2006 three such Groups reported on their findings: “Science Cooperation”, “Science and Media”, and “Privacy in the Information Society”. A new Working Group “Evaluating for Science”, launched in 2009 and led by the Dutch KNAW, is focusing on a new European Evaluation Protocol for institutional evaluation, and has also discussed studies on the societal impact of science, the specificities of evaluation in the Social Sciences and Humanities, and university rankings. The experience of this Working Group has already been put to effect during a comprehensive Evaluation of the 69 research institutes of the Bulgarian Academy of Sciences (see further below). A further Working Group was launched to consider Academy interventions in favour of inquiry-based science education, following an initiative by the French *Académie des Sciences*. After preparatory meetings in 2008, the European Academies Network on Science Education was launched in Paris in June 2009 and accepted as an ALLEA Working Group in autumn 2009. The main objective of this WG is to help improve the quality of science education across European nations by sharing relevant experience and to work together with the InterAcademy Panel’s science education programme at the global level. The WG “Science Education” has by now established an excellent working relationship with the European Commission, and has been asked to conduct an impact study of a FP-funded pilot project. Both WGs are undoubtedly tackling key problems, for the understanding of which there is no better means than the sharing of experience. It is a token of this that the question of learning and science education was at the heart of the ALLEA General Assembly conference in 2010 (see below).

#### ***Other activities within ALLEA***

Besides studies and events organised by Standing Committees and Working Groups, two specific actions of wider impact should be emphasized. One was the evaluation of the 69 research institutes of the Bulgarian Academy of Sciences. This was a joint undertaking by the ESF and ALLEA, which combined their previous experience in order to carry out the comprehensive, international, scientific evaluation of 69 institutes engaged in practically all fields of knowledge. The evaluation process was undertaken in the period from May to October 2009 with more than 40 international experts. It was to some degree similar to the evaluation undertaken by the Swedish, Danish and Nor-

wegian Academies at the beginning of the 1990s of research in Estonia, Latvia and Lithuania. The evaluation yielded a five-volume study with recommendations for institutes and the Academy, but also for the science system as a whole. Several recommendations of the Evaluation Panels (Research... 2009) were adopted by the BAS as a basis for restructuring the whole system of their research institutes. This exercise provides a good example of the potential use of peer review in the academic world for the improvement of the framework for research.

Another wide-ranging action was the initiative “Towards a European Young Academy” also initially conceived as a joint action with the ESF. In 2008 ALLEA chaired the programme committee that prepared sessions in the “Annual Meeting of New Champions” in Tianjin, where the World Economic Forum and the IAP jointly supported the presence of some 50 young scientists selected worldwide to discuss problems relating to research and society. These young scientists issued a Statement which concluded: “Making a better world needs better science – we young scientists are ready to contribute our share.” An ALLEA study conducted in early 2009 showed that almost all Member Academies offer specific support to early career scientists and scholars. Some have established Young Academies (Germany, the Netherlands, Austria, later also Sweden Poland etc.). A series of ALLEA meetings in Vienna (2009), Madrid (2010) and Antalya (2010) made the level of interest in YA apparent, but, together with discussions at the General Assemblies, also served to highlight the practical difficulties standing in the way of the creation of a European Young Academy. The Annual Yearbook 2009 provides a detailed account of this project, and of the various inputs received from Member Academies.

One thing is clear, that it is not enough for the scientific community to support young scientists; it must also listen to them and allow them to contribute to science policy discussions. Whatever the plans for Europe 2020 or the Renaissance of Europe are, the role of young scientists must be seriously enhanced, and their voice heard. This is a message that the Presidency and the executive director have repeatedly given at meetings on science policy in Europe with the Commissioner and a variety of advisory bodies.

### *Strengthening the Academies*

In all its basic documents ALLEA’s role is described as assisting its members by offering a platform to discuss and coordinate their multilateral science and science policy engagements and by creating

synergistic exchanges between members. The conferences organised by ALLEA, including those within the framework of the General Assembly meetings, were all predicated upon this principle of sharing experience. Likewise, many workshops of the Standing Committees and Working Groups discussed problems which were undoubtedly of common interest.

Certain ALLEA conferences had a specific purpose, as was the case of “Emerging Regional Co-operation. SEE Academies of Sciences and Humanities in the ERA” (2007). The goal of this conference was to strengthen scientific and scholarly co-operation between the academies in South-East Europe and the other academies in the ALLEA family, to address common and societal topics and to share experience from the EU and regional collaboration. Altogether 21 academies took part alongside representatives from the EC, ERC and the European Science Foundation. The materials from the conference and a summary of the proceedings were subsequently published as an ALLEA Report (Emerging... 2007). In 2008, the ESF/ALLEA high-level meeting “Strengthening the role of Academies in the ESF” focused on how better to harness the potential of academies and within ESF (Strengthening... 2009).

Member Academies themselves also organised numerous meetings in which other academies participated; of particular interest are those involving regional networks (in the European sense), organised for instance by the IACSEE, the Vyšegrad Four Group, Nordic, Baltic and other clusters of academies. At those meetings joint research programmes are proposed, current science policy trends analysed, joint awards handed out, etc. Sometimes the topics of such meetings are even broader: for example, in the case of the Baltic academies it is traditional to discuss issues of intellectual cooperation between the countries.

Another interesting example is the initiative of the French Academy of Sciences in organising a network of academies around the Mediterranean Sea, the so-called Inter-Academic Network for Development (GID) in science and technology, reaching out towards Africa and the Middle East. The idea of promoting and fostering a sense of scientific identity in the Mediterranean region is timely even if, in 2011, its progress is hampered by political instabilities in Africa.

Such direct cooperation between Member Academies was analysed by a special ALLEA Working Group on “Research Cooperation”

led by J.Engelbrecht (2007). There is a variety of modalities: schemes of bilateral exchange of scientists and scholars, bilateral conferences and regional conferences, joint awards for experienced researchers (Baltic academies) and young researchers (Vyšegrad academies), joint projects (South-East Europe academies), academic centres established in other countries, etc. The advantages of such cooperation include direct contacts which may later facilitate long-term studies, seed money for wider cooperation, mobility grants and so on. Last but not least, contacts between top scientists always enrich the scientific culture.

A recent development in ALLEA work is to support academies which take the lead on a specific topic and carry full responsibility for subsequent actions under the heading “Interest Groups”. A very promising example is the initiative of the British Academy, which launched an Interest Group on Social Sciences and Humanities in the next FP in 2010. The meetings (Rome, 2010; Brussels and London, 2011) and the intensive work of the British Academy have resulted in a Position Paper on the importance of Social Sciences and Humanities, which was submitted to the Directorate General. This paper also provided input to the ALLEA Position Paper on the EC Green Paper 2011. And this in turn has attracted further attention in the wider scientific community and in other organisations to the need to include research in the Social Sciences and Humanities in the CSFRI.

And finally, an important area of intervention by ALLEA is to lend support if, for one reason or another, an academy or the whole science system is under political pressure from Government. Such cases, stretching from budgetary cuts to curtailing the autonomy of an academy, are unfortunately not unknown. When appropriate, ALLEA has sent letters to senior officials in the countries in question explaining the significance of the freedom and independence of academies, and the importance of research for society. Academies know that in such cases they can rely on the support of ALLEA and the international community. In many cases the pressures are related to economic problems, and one might hope that they will diminish in the future. But in the meantime, the policy-makers could learn from the example of Finland where first in the early 1990s and again during the recent financial crisis, the Government had to introduce cuts in the state budget. In both cases, their R&D budget was not reduced, but on the contrary some increase was planned. The reason is simple: knowledge is the most

important asset for societies in difficult times, and a country that supports research can recover more quickly.

### *Partnerships*

ALLEA has always been keen to develop partnerships with other key stakeholders in the academic landscape; some of them have different ‘constituencies’, some have a membership that overlaps with subgroups of ALLEA members. ALLEA believes however that if there are similar attitudes towards fostering research and enhancing science-society links, then we should think about the possibilities of cooperation. We know that the world is competitive and the notion of competitiveness is embedded in the Lisbon documents, sometimes creating problems of identity for stakeholders; where such problems touch upon an organisation’s identity, we must remember that identity is not a fixed state; it is a process, and those who are able to understand the changes will be all the stronger for it.

In Europe, we have many science organisations working for or in the ERA: ESF, EASAC, EUA, ISE, LERU, Academia Europaea, and so on; worldwide there are IAP and IAC, ICSU, UNESCO, OECD. These lists are certainly not complete. Here we shall discuss two important and very diverse partnerships. The European Science Foundation (ESF) had 80 members in 2009, including research funding and research performing organisations and academies from 30 countries. The ESF booklet in 2009 still stated: “The challenge but also the strength of ESF lies in this diversity, as long as a common will can be crystallised...”. It seems unfortunately that the common will has lost force in the course of the last few years: the group of heads of National Research Councils (EuroHORCs), having gained even greater weight in ESF, has come to the point of proposing a new organisation; at the same time, increasing numbers of Academies have left the ESF.

There had been a certain overlap in the membership of ALLEA and ESF – 19 ALLEA Member Academies were members of the ESF in 2008 (the President of ALLEA being an observer on the ESF Governing Council). Notions of cooperation between the Academies inside the ESF were discussed at the ESF/ALLEA high-level meeting “Strengthening the role of Academies in the ESF” (Brussels, 7 March 2008), following a survey of views on and expectations of the role of academies in the ESF, and of the role that the ESF could play for the academies. The questions addressed to the academies concerned were

on ‘ownership’ of the ESF, on the activities and instruments of the ESF, on the visibility of academies in the ESF, etc. Altogether 13 academies were represented at the meeting, together with ALLEA and the ESF. The workshop produced ideas for the future, including:

- Research Integrity Network – involving an application to the FP7;
- Evaluation: European Reference Index for the Humanities – the academies were invited to cooperate;
- Guidelines for Peer Review/Evaluation – cooperation between ESF and ALLEA should be expanded;
- the role of academies in further ESF Forward Looks should be enhanced;
- proposals were invited from academies for ESF instruments and conferences, including the 2<sup>nd</sup> Europe-Africa Conference (March 2009).

As regards future activities, the vision for and landscape of the ERA beyond 2013 were mentioned as well as the future of learned publishing and Young Academies. A summary of the papers given and the recommendations for future actions are reflected in a joint publication of ESF and ALLEA: “Strengthening the Role of Academies in ESF” (2009).

If this workshop signalled a clear wish to enhance the position of the Academies in ESF, concurrently EuroHORCs had a very different opinion. What then followed is a saga deserving more detailed analysis because it demonstrates clearly how complicated science policy can be.

The EuroHORCs planned to create a ‘new ESF’ that would represent research funders only – later the potential membership was enlarged to include research performers – and to focus on science policy rather than the funding of collaborative research and networks. While one could readily agree with the need for better representation of the Research Councils in science policy debates in Europe, the benefit for the scientific community of proposals for a restructuring of the ESF did not become clear. The Academies that were members of both ALLEA and ESF prepared a statement “Towards a ‘new ESF’” (2010), which offered an analysis of a number of important issues: strengthening the voice of science in Europe, strengthening the voice of scientists in the ‘new ESF’, implementing cutting-edge science agendas in Europe, and investing in creating critical mass through networks. In conclusion, the Academies raised two vital questions: “what can the scientific commu-

nities do for a new ESF?” and also “what must a new ESF do for us scientists?” While the Academies expressed their concern about the scientific governance of any ‘new ESF’, plans were made elsewhere to shut down the present ESF offices in Strasbourg as quickly as possible and to create a new organisation ScienceEurope in Brussels. These plans failed to get the necessary approval at the ESF Assembly meeting (May, 2011). Nevertheless, the plan to launch a new organisation is going ahead (at the time of writing, it is known that the launch is scheduled for the autumn of 2011). As a result, academies started to leave ESF in growing numbers (by June 2011, a group of seven had decided to leave).

The debates around these changes have clearly demonstrated a great divergence of views. One of us (JE) has expressed the opinion that “the new organization will lose diversity, and ... networking [among scientists] will be much weaker than that promoted by the present ESF” (Clery 2011). And E.Banda, the former CEO of ESF, echoed this when he said that what Europe needs is “a reinforced ESF, concentrating on collaboration, with real money” (ibid). A group of scientists (Henriet et al.) from nine countries expressed the view that if the ESF is closed down then “a proven and unique operational infrastructure in support of curiosity-driven research will be lost, exactly in times when the future of collaborative research in Europe is far from clear and the world is shaken with major crisis” (Henriet et al. 2011). On the other hand, the supporters of the new organisation claim that it will have vision as well as muscle – the EuroHORCs members do indeed spend about 29 billion Euros a year on research.

We have described these events here because they demonstrate that not everything is simple in science policy. In this particular debate, Academies have shown a strong will to support the collaboration and networking at a high scientific level which had up till now been steered by ESF, and especially by its Standing Committees.

There is another partnership that is part of ALLEA’s history, which is of significance for the position of academies in Europe: in 2001, delegates from a number of EU science academies established the European Academies Science Advisory Council. EASAC’s aim was to provide scientific advice to European policy-makers, focusing on three portfolios: biomedical sciences, energy and the environment. EASAC has 23 personal members from the EU science academies and two from associated countries, together with representatives of ALLEA

and FEAM (*Fédération Européenne des Académies de Médecine*). Following a decision of its Board, ALLEA had first asked those of its Member Academies that have a delegate on the Council how they would like to see the cooperation between ALLEA and EASAC. Respondents were explicit in wanting better coordination and more visible complementarity between the two bodies. A meeting at presidential level was held (Brussels, February 2011); followed by a meeting with representatives of the Board and the Council (London March, 2011), which led to an agreement on a joint statement about the role of Academies in Europe. While ALLEA had contributed to EASAC meetings throughout, EASAC was now invited to send a delegate to the European Academies Science Policy Task Force. Shortly thereafter the Boards met in London (March, 2011).

Partnerships with other networks in the wider academic world take different forms, and are often theme-specific. In the global arena, we have been working with IAP throughout the period 2008-2011 towards spreading the idea of Young Academies; more recently we have offered support to their activity on scientific integrity. The ALLEA Working Group Science Education functions as the European arm of IAP's science education programme. With ICSU there have been exchanges on research integrity ever since 2006, on data systems (since 2008); some joint activities are emerging between ICSU's Committee on the Freedom and Responsibility of Scientists and ALLEA's Standing Committee on Science and Ethics. Similar topics have been at the heart of exchanges with the relevant committees and working groups of the OECD and UNESCO.

In Europe, we have been exchanging ideas with FEAM – the European network of medical academies – about ethics in research training; with EuroCASE – the European network of engineering academies – we have been discussing the recent turn towards 'innovation' in EU science policy; with ISE we have been jointly pushing for the establishment of the European Research Council since as early as 2006; with EuroCRIS we have been debating at strategic seminars ever since 2008 various aspects of the use of research information systems for the ERA. It is also worth noting that although no formal platform exists for regular contacts between ALLEA and the European university networks, such as the League of European Research Universities (LERU) or the European University Association (EUA) the statements and general approaches, notable of LERU and ALLEA, often show similar

convictions, for the obvious reason that both organisations strive for excellence in research, and there have been specific exchanges with EUA on issues such as support by universities for Palestinian higher education, and university rankings.

With the services of the European Commission – Commissioners and DGs, and at the operational level – cooperation depends on the topics in question. The general ALLEA statements on science policy have been welcomed by the successive Commissioners and directors general. ALLEA representatives have been regularly invited to science policy meetings, whether on the ERC, Joint Programming, Grand Challenges, research infrastructures, research careers or the modernisation of the universities. The ALLEA Statement on the EC Green Paper 2011 led directly to an invitation from DG R&I to the ALLEA executive director to be one of the opening speakers on the problems of social innovation at the first general discussion on the CSFRI.

We are heartened that through the efforts of this presidency and its advisory bodies, some of the basic questions have been brought to the attention of the Commission, its Bureau of Policy Advisors and other EU advisory groups, such as the ERAB: are higher education and research funding schemes across Europe equipped for the envisaged innovation drive, especially in the hard sciences and engineering? Are the potential contributions of the social sciences and humanities underestimated in this context? Should a European programme that focuses on society's ability to innovate not give more importance to science education? Is the 'complexity' referred to in the EC's Green Paper of 2011 more than perplexity in the face of fragmentation – mistaking diversity for an obstacle rather than seeing it as an asset to be harnessed for better results in the complex and self-organising ecosystem of science? A list of similarly poignant and pertinent questions could easily be prolonged – ALLEA with its contributions on policies for science tries to make sure that policy makers and science managers have the benefit of the scientists' views on these topics.

### **Europe: competition and collaboration**

Our engagement with European science policy on behalf of the academies has allowed us to come to the conclusion that the construction of the European Union is a constantly continuing process – one that must be seen in the context of the wider Europe (about half of

ALLEA's members are from non-EU countries) and of new global constellations, politically, economically and scientifically. In 2011, Europe is weary of its debates, of constantly having to fend off problems – many of which arise from lack of coordination and joint forward planning – and of the absence of a leading idea. As we also keep telling ourselves in ALLEA, the diversity of Europe should be an asset; but for this to be the case the large countries would have to adapt their independent line of conduct to their shared responsibility for Europe. In ALLEA we have sought the answer not by submitting to political prerogatives, but thorough inspiration from semiotics (Lotman et al. 2004), by accepting the differences between I-identity and we-identity, by working on the relations between the whole and its parts, and by stimulating dialogue – a better knowledge of each other has helped us to appreciate the weight as much as the opportunities offered by history. Similarly, Europe will be better able to react to pressure in the fiscal sphere, or on issues in migration, energy supply and the environment, if the rich and diverse heritage of its constituent parts is seen as the wellspring of a multitude of new solutions. The various programmes set up by the European Commission have helped promote this process through networking and collaborative research; but the rule of bureaucracy shines through – with unrealistic targets that do not correspond to any political will (vide: the 3% of GDP target for research investments, employment and economic growth rates etc.).

In science, progress is sometimes achieved by individuals following an all-encompassing desire for knowledge; but increasingly, scientific and scholarly advances are based on cooperation: here, too much stress on competition as the guiding principle is not productive. One needs only to consider how N.Bohr and A.Einstein had different views on particles and waves, and how they solved the problems by discussing them with each other. This open-ended free and democratic exchange – as frankly competitive as it was collaborative – should serve our European academies as an example when facing that other contemporary flaw of science policy: the requirement to submit project plans with preset deliverables. While straight-jacket-like rules are applied to individual projects, the big picture is rarely translated from the political rhetoric into concrete policy measures: the EU needs 1 million or so more researchers by 2020, but no indication is given of how universities, with merely nine years to go, can possibly meet this target. Here, policy interventions from ALLEA – as the independent

voice of the best minds in the different national scientific communities – are needed. Such a Europe-wide voice is needed, especially as national science strategies converge and instruments are created to channel funds accordingly, as, for example, with the Joint Programming Initiatives. Such very large initiatives have their merit in responding to Grand Challenges, but it sometimes appears as if they are used as a device to cut support for blue-sky research, thereby de facto stifling new initiatives.

The EC Report “Taking European Knowledge Society Seriously” (2007) had already addressed many important issues, ranging from regulatory appraisal, the proper treatment of uncertainties, insensitive public definition, regional capacities for accountability, the social distribution of knowledge, and institutional ethics at European level. This report also asked the very sensible question: if – one day – the 3% target is achieved, what would Europe do with the money? We are thrown back to the need to create a degree of consensus between the aspirations and ambitions of science and society: innovation as today’s mantra does not necessarily apply to all the diverse parts of Europe, nor do current conditions allow all parts to contribute creatively to the solution of problems that we are facing together. Critical voices – such as Kaiser and Prange (2005) who point to the discrepancy between international and global trends on the one hand and regional and local ones on the other – may need to be listened to more carefully.

In addition to discrepancies between regions, we shall have to follow equally carefully the recent institutional innovations in our own area – scientific research – , where new ways of dealing with knowledge are introduced. Among the new enterprises there is for example ISIS Innovation at the University of Oxford, which offers to help researchers to commercialize intellectual property arising from their research. On a larger scale, the European Institute of Innovation and Technology with its Knowledge and Innovation Communities (KICs) is also meant to unite the three parts of knowledge triangle: research, higher education and industry. In this environment, Academies as research performing organisations have Technology Transfer Offices; they apparently operate with varying degrees of success, and a joint exercise to exchange best practice would be valuable, as also perhaps with other research performing organisations, such as Max-Planck Society, CNRS or CNR.

### *Science in society*

We have described some of the activities of academies and of ALLEA over recent years, and given an outline of some of the challenges in recent science policy developments in Europe that Academies will have to reckon with. While much has been achieved and we can be rightly proud of that, we must also accept that with a minimal office structure, ALLEA has not been able to promote its achievements as a more robust structure could have (one of the key arguments, incidentally, in the Strategic Plan 2010-2015). Having said this, we need to ask: are these activities visible, are the actions streamlined enough, is ALLEA known in the academic world, in the EU and worldwide? For it would be artificial to separate academies from the community of scientists and scholars, even though historically academies have a special place in the academic world. But in what follows, we will not be concerned with communication between scientists: ALLEA does not, itself, promote research activities and has not been created as a channel to advertise its members' research achievements; rather we shall focus on the multitude of channels through which ALLEA contributes to advancing the science and society dialogue. We shall attempt to concentrate on the visibility of science in society, and then on the visibility of academies.

The recent Eurobarometer (2010) provides a snapshot of how society currently views science and technology. There are signs that, very slowly, people are expressing more of an interest in new scientific discoveries, and developing a positive – if critical – view of science. But there is also the downside: many people do not trust scientists, whom they think are unable to see problems in a wider perspective. Furthermore, many people think that the problems we are facing are so complex that specialists in science and technology are no longer able to understand them. The figures from Eurobarometer 2010 can be contrasted with the experiences of some Academies in their respective national contexts. First, the view that scientists are unable to look at problems from a wider perspective found fewer supporters in Hungary. This coincides with the results of opinion polls in which the Hungarian Academy of Sciences tends to fare very well, receiving a high ranking in terms of trust. The reason, reported by the former vice-president of the Academy, Norbert Kroo (in a private communication), is that the Academy has for many years used every means to promote science–society relations, whether through open lectures, TV programmes, popular sci-

ence publications, etc. Among the surprising results of the Eurobarometer data we find that the percentage of those who took the opposite view on the same issue is highest in Finland – the European showcase country with its exemplary support for R&D, much higher than the Lisbon target of 3% of GDP, while the percentage of those who think that scientists cannot understand complexity is the lowest in the Netherlands, a country where public investment in science has been steadily decreasing for years.

We understand from these impressions just how wide the diversity of understanding of the role of science and scholarship is in modern society. The questions we need to ask are: what can academies do to enhance the visibility of science, to foster research and to increase research funding, while at the same time building links between science and society? And: are academies visible in this respect, and is their voice listened to?

A good starting point is the moral health of the scientific community: ALLEA has always argued that it depends upon research integrity. Scientists, and academies in particular, are much exercised by this, as witness ALLEA's Memorandum on scientific integrity and the Code of Conduct, a host of documents that serve to establish 'good manners in science' (as published, for example, by the Academies in Poland and Romania), and the recent drive towards "responsible conduct in research and innovation". The joint work of ALLEA and ESF has led to recommendations on how cases of scientific misconduct and fraud can be rapidly discovered and dealt with. This is, in short, an area to which academies and ALLEA have traditionally made substantial contributions (The European Code... 2011; Memorandum... 2003; The Ethical... 2007).

The next question is about the lines of communication between science and society. Once again, the very basis for an effective information flow between scientists and society is trust. One way to enhance trust is to improve science literacy, which can be achieved through better education. The ALLEA Working Group on "Science", "Society and Media" dealt with questions of science communication in its Report and recommendations published in 2007 (Schamp 2007); the examples of follow-up activities in Belgium were reported at the ALLEA extraordinary strategy meeting in 2009. Currently, a number of Academies are feeding these insights into an ESF Forum on Science

and Society, and a recent ICSU workshop on science communications has also benefited from the input of European Academies in this field.

Academies contribute to the visibility of science, and they themselves are visible not only through their beautiful buildings, such as those for example in Paris, Budapest, or Rome, but also because they represent the best of science and scholarship in the eyes of society. And if an academy is 150 years old in a country like Croatia which has only been independent for some 20 years, then the visibility of the Academy is obvious. The Montenegrin Academy of Sciences and Arts, launched only in 1971, has been charged with the national Development Strategy of Montenegro and the National Development Plan entitled “Montenegro in the 21<sup>st</sup> century in the era of competitiveness”. The role of the Academy in the country is clearly central, and the Academy has also systematically sought to internationalise its debates through conferences and seminars.

Indeed the visibility of science and of the academies depends to a large extent upon a wide range of conferences that function as platforms for far-reaching debates about the relationship of science, culture and society. The titles of a selection of those many conferences where the ALLEA Presidency has advocated the role of Academies in national and international science systems can perhaps convey the flavour: “European Science: a Modern Interpretation of Basic and Applied Science” (Vienna, 2006); “Unity in Science” (Cairo, 2006); “Science, Technology and Human Values” (Athens, 2007); “The Future of Science and Technology in Europe” (Lisbon, 2007); “Conference on the advisory role of academies” (Amsterdam, 2008); “Promoting Science in the Service of Society” (Berlin, 2008); “Mediterranean Scientific Conference: Towards the Creation of a Mediterranean Scientific Area” (Paris, 2008); “Science, Higher Education and Innovation Policy” (Budva, 2008); “World Economic Forum Annual Meeting of New Champions: The Next Wave of Growth” (Tianjin, China, 2008); “The Role of Basic Research in the Process of Structuring the European Research Area” (Prague, 2009); “New Worlds – New Solutions” (Lund, 2008); “Science and Accountability” (Jerusalem, 2010); “Mapping of Academic Excellence in the Context of Quality Assurance” (Maribor, 2010); “Research and Development as the Basis for Innovation in Creating the Competitive Region” (Podgorica, 2010), etc. Some of these were organised by academies, some by academic organisations, and some by governments as part of the EU Presidency cycle

of R&D related conferences, but in all of them academies could be given a clear voice. The outcomes are always addressed to a larger community; be it a country, a region, the EU or the wider world. It is no accident that ALLEA or academies have been represented at the most important EU Presidency conferences in recent years, and their opinions taken into account.

Having said that, however, it must be recognised that not all the opportunities to do so have been seized. Examples are the biennial ESOF meetings, where, despite some individual appearances of Academicians in 2004, 2006 and 2008, academies were not always represented (Quéré 2010). For instance, at ESOF 2010 in Turin only a comparatively small number of senior officials responsible for science policy attended the event, which excluded from its programme such major policy issues as cuts in research budgets; it is symptomatic that C.Macilwain had to warn, in a fairly critical *Nature* article, that the economic crisis has overshadowed many of the good ideas otherwise promoted in Europe, and that “the research community is ill-placed to respond” to this new crisis (Quéré 2010). This is a serious challenge, not least in terms of communications, for all scientists and scholars and their Academies: indeed a proposal by ALLEA, the Royal Irish Academy and NAS to hold a large conference on the societal responsibility of Academies during ESOF 2012 in Dublin may also have fallen prey to the budgetary crisis sweeping through Europe

Yet, it is up to the academic community as a whole to assume its responsibility vis-à-vis society by continuing to explain why it is necessary to foster the best of research and by strengthening its skills in communicating in society, or, in the words of Yves Quéré, “to promote the idea that science is both a magnificent adventure for mankind and a necessary force for development” (Macilwain 2010).

### **ALLEA: the road to the future**

The aspirations of Europe to become a knowledge-based society correspond closely to the aims of academies. The vision that lay behind the launching of ALLEA (ALLEA History... 2005) and its Strategic Framework 2008-2010 (ALLEA Strategy... 2008) was to unite Member Academies in science policy questions at every level: the promotion of excellence in science and scholarship, the offering of independent ad-

vice on science policy issues, the addressing of issues related to research integrity and so on. The world is developing fast, and Europe with it; every organisation must position itself in relation to the changes. ALLEA strives to adjust to change, but also, as an organisation of scientific and scholarly academies, to foresee change and if possible to see further ahead than society. In the collection of essays “Seeing Further”, published by the Royal Society to celebrate its 350<sup>th</sup> anniversary, the President, Sir Martin Rees writes: “The outcome depends on us. Wise choices will require the idealistic and effective efforts of natural scientists, environmentalists, social scientists and humanists – aided by the insights that twenty-first-century science will surely bring” (Rees 2010).

ALLEA too is adjusting to the requirements of the 21<sup>st</sup> century: we would not hesitate to admit that the strategy proposed in 2011 is necessarily different from what was envisaged when ALLEA was launched some 20 years ago. But we are all convinced that however agreeable they were, the biennial meetings of the 1990s are no longer sufficient to make a mark in the changing landscape of European science. Yet, there is a strong basis to start from: (i) ALLEA has grown from a loose network into a organisation that can unite academies for joint actions; (ii) ALLEA is a fully democratic organisation: all member academies can propose actions, and all are jointly responsible for supporting such activities through membership-dues; (iii) the team-work of Presidency, Board, advisory bodies and secretariat is essential for the coherent articulation of a voice of the academies; (iv) the insight into the value of diversity and the creative force of complex systems is systematically translated by ALLEA into policy positions: one size does not fit all (no Procrustean beds in science policy); (v) the Presidency and executive director serving on many EC committees and groups give additional outlets for ALLEA’s core messages. Among the key problems to be addressed are: (i) the mismatch between the wishes of member academies for representation at European level and their reluctance to set up and finance the structures proposed; (ii) the challenge of reconciling the national responsibilities of national Academies, with the role of ALLEA as their European Federation; (iii) the need to improve science support to the advisory bodies and the visibility of the activities of academies can only be solved with a proper level of staffing (whether seconded or hired). Some of these issues were articulated towards the end of the process of devising the ALLEA

Strategic Plan 2010-2015 in a document “ALLEA: connecting scientific excellence for the benefit of European societies”, where three c’s – changes, challenges and chances – were blended into a whole.

In what follows, we describe the recent debates on the future of ALLEA as the umbrella organisation for the national academies in Europe.

The discussion on the ALLEA Strategic Plan 2010-2015 started in 2009. It was the main topic at the ALLEA “Extraordinary Strategy Meeting” (Amsterdam 16-17 Nov, 2009), a meeting that proved pivotal for ALLEA’s future. The structure of this meeting can be explained with the help of a simple principle derived from control theory: first determine where you stand, then determine your final destination; only then can you envisage the road between your present state and your final aim. The first session was designed to celebrate the 15 years from the formal launch of ALLEA in 1994 and to show where we stood. The activities over those years were surveyed and the prospects of academies in times of socio-economic crisis discussed. The review of these 15 years demonstrated the accuracy of the far-sighted ideas of the founding fathers. As we enter a new phase of ALLEA’s history, its opinions are sought by other stakeholders and by the EU as a whole, but equally important are the ambitions of member academies, which had been consulted throughout 2009 in the run-up to this meeting. This is a serious responsibility for member academies. During the working sessions, topics discussed ranged from science policy perspectives to the roles of the academies and of ALLEA’s advisory bodies and partnerships, to new future initiatives proposed by member academies, etc. – all aspects which must be taken into account in any future Strategic Plan for ALLEA. Particular attention was paid to the Board proposals for membership-fees based funding of future ALLEA operations, which had already been requested by the General Assembly meeting in Madrid (2008).

The plenary discussions laid the foundations upon which the Presidency, Board and secretariat began to construct the Strategic Plan and the Implementation Plan for 2010-2015. In addition, the statutes and by-laws, accepted by the General Assembly in 2006, had to be amended in the notarial deed according to the requirements of Dutch law. The mission and vision for 2015 and the purpose of the Strategic Plan were thus formulated: ALLEA is placed in the European context and its role in serving its member academies is described. “ALLEA mobilises,

through its Member Academies, excellence, experience and expertise that enable science, research and higher education in Europe to better contribute to a knowledge-based European society. The Strategic Plan 2010-2015 articulates the opportunities and highlights areas of intervention for ALLEA to function as a prime resource for expert analysis and advice to science policy stakeholders inside and beyond Europe in all matters relating to the many interfaces of scientific progress and societal needs.”

The document includes a SWOT analysis and the main goals and conditions for and measures of success are identified. The Implementation plan goes into considerable detail of future activities which would be required to translate the Strategy into action.

The Implementation Plan describes the functions of the General Assembly (now annual instead of biennial), the need to transform the Steering Committee into a stronger Executive Board, and details of the responsibilities of the Presidency and the secretariat. Much space in the Implementation Plan is devoted to ALLEA advisory bodies – the Standing Committees, Working Groups and Task Forces. This was the first time that the principles for setting up these bodies and their functions had been described in such detail. In addition, the working plans of existing Standing Committees and Working Groups for the period 2010-2012 were presented as they had been discussed at the extraordinary strategy meeting of member academies in 2009, as well as their ambitions for the second part of the period to be covered by the plan

Bearing in mind the number of ALLEA Member Academies, their role in society, and the expectations from other stakeholders in Europe, notably the political authorities, it is proposed to enlarge the Secretariat from the present staff of two to four persons. This was expressed in a measured proposal for membership-fees, coupled to the principle of lead academies which later received more detailed description. The Strategic Plan deliberately chose to forego those ‘unwritten rules’ applicable to civil servants, where a fixed number of goals, predicted deliverables, and self-fulfilling milestones and indicators are submitted. Much of the dynamics of an organisation such as ALLEA depends on the willingness (and ability) of members to act and react to the changing policy environment in which they exist – any bureaucratic proposal to move ahead regardless of the available energy and enthusiasm of members would fatally misjudge the true richness of ALLEA.

As it stands, the document sets out the values and aspirations for the future that come from uniting the intellectual potential of academies.

These Strategic and Implementation Plans were discussed at the General Assembly hosted by the four Swedish member academies in Stockholm (15-17 April, 2010). Unfortunately, the business meeting was literally overshadowed by the Icelandic volcanic ash cloud, which prevented several delegates from arriving, and caused most of those who did arrive to leave early. As a result not all decisions could be taken, but it was nonetheless agreed to accept the draft Strategic Plan as a basis for a final more succinct version. The amended Statutes were also agreed (subject to a final electronic vote); the member academies present also approved the new scheme of financial contributions in principle, requesting however a mechanism to commit in-kind contributions instead of transfers of funds. This request was accepted and implemented in autumn 2010, but the resulting call for expressions of interest for in-kind contributions did not yield more than two realistic offers (neither of which was eventually pursued by the academies concerned). The business meeting demonstrated on the one hand the diversity of ideas, but on the other a determination to find solutions together.

The period between the General Assemblies in 2010 and 2011 was devoted to further discussions with members about the Strategic Plan and its implementation, with a core-element being the membership-dues based financial scheme. Formally there had been a majority of votes in favour of the Strategy and the related financial commitments, but there were also some doubts expressed by, and negative responses received from, a number of key member academies.

In order to overcome this impasse, the Board and the Presidency proceeded to draft a slimmed-down strategy for ALLEA with a minimal office and a transition plan that aimed to keep costs for 2012 at the current level. This modest transition plan reinterpreted the leading elements of the Strategic Plan 2010-2015 in the light of the concerns expressed and proposed a refocused portfolio of activities and operational mode. The focus was now on two main clusters of activity: “Policies for science in Europe” and “Science in European societies”. The first cluster included the establishment of a “European Academies Science Policy Task Force” that would contribute to formulating ALLEA science policy positions with regard to developments in Europe.

Before the General Assembly 2011, a working meeting was called in London (8 March, 2011) where those Academies that had voiced hesitations about supporting the Strategic Plan could react to the proposed draft and/or propose alternative scenarios. While the principles of the slimmed-down transition plan received a positive welcome, the financial commitments from these members were still not forthcoming at the level required. Member academies therefore suggested that the staff of the secretariat should be kept at its present level, and that emerging activities should expect infrastructural support from lead academies.

As a result, the Board faced a situation where it was impossible to submit a budget for 2012 to the General Assembly based on the original Strategic Plan; nor did it seem appropriate to further slim down the minimalist transition plan. For even for the Transition Plan to succeed, the support of all members is needed, bearing in mind that even the Strategic Plan discussed in 2010 reflected the proposals of the Member Academies.

The General Assembly held at the Royal Netherlands Academy of Arts and Sciences (Amsterdam, 12-13 April, 2011) came to positive conclusions in all its discussions except that of the financial plan.

The Science Policy Task Force had its first meeting, and the opinions from the Member Academies were presented in regard to the EC Green Paper, enabling the ALLEA Position Paper on the Green Paper to be formulated (see above).

The Presidency and the Board were faced with a paradoxical situation: an organisation that gave its support for the full or transitional strategic plan, agreed on the need to shape its future, but was unable to agree on how to provide the necessary funding. For the time being, the confidence to deliver the vision of an ambitious inter-academy organisation in Europe was lost. As President and Vice-President, we are jointly responsible for this impasse. After long discussions, we decided that there was no alternative to stepping down from office. As we explained in our letter to Member Academies, and declared at the General Assembly meeting, we shall of course continue our business in a caretaker role until an extraordinary General Assembly in late 2011. A newly elected President can then consider all the options for the future and start a new year in 2012 with new ideas and whatever budget is available.

## **Values and visions for the future**

Much of this essay has been written looking back to past achievements and reflections; the future appeared at best as a very uncertain tomorrow – both in terms of the policy and economic contexts, and increasingly also in terms of the viability of the European inter-academy organisation that is what members had wanted ALLEA to be. Even with hesitations and worries seeming to undermine the joint action of Academies, there are challenges that will not go away – and where the absence of a strong and independent voice of science in Europe, as a strong ALLEA should be, will soon be felt.

Firstly, the credibility and success of science depends upon the basic values of research – objectivity, reliability, testability and conceptual power – and upon a bond of trust between scientists and society. As national science systems begin to converge – the European Framework Directive is expected to come into force soon – it is more necessary than ever to have an independent voice of science in Europe that can articulate and enforce these basic rules. At the same time, that voice can help to create awareness of possible reasons for any misconduct. Among these are the increasing administrative pressure to publish, competition for diminishing funds, competition for success in careers in a shrinking labour market etc.

Secondly, research in Europe needs reliable framework conditions. Academies have long advised their governments on their national science systems; now they have to work together to determine what will happen at European level. Such advice becomes the more significant as Commission rules increasingly determine national science systems (structural interventions; priority setting; clustering; funding modes; eligibility of costs etc.). Against this background, we need to continue to put forward the views of the foremost scientists in Europe, encapsulated as they are in some of the statements of principle promulgated by ALLEA: research matters; basic research is an investment not a luxury (ERC); the social sciences and humanities must be included in any programme tackling societal challenges (the recent position paper); ethical principles must guide research; science education as the foundation; Young Academies as a way to prepare the next generation of science leaders for their societal and political responsibilities as scientists. There are many structural contradictions that science policy needs to tackle, and where advice from academies can be helpful, as for example

such basic dilemmas as equality vs. efficiency, individual freedom vs. collective strategy, spiritual values vs. material ones and short- vs. long-term thinking.

Thirdly, academies are cultural institutions of a certain age and status, but there is some doubt as to whether we have truly reached a European culture, within the European Union or the wider Europe as represented in the Council of Europe. If academies concern themselves with education, it is also because the inculcation of values should start from the earliest age, and because they consider it crucial to keep alive the inborn impulse to discover and to learn. Academies, unlike administrations or enterprises, embody traditions of learning and wisdom (Scaramuzzi 1999).

Fourthly, Academies have shown that they do not depend on diplomatic relations to establish world-wide consensus on scientific or indeed societal issues. Nor do they have any cause to be concerned with profit when advancing and sharing knowledge. Yet their greatest value accrues to society when they use these unique assets to give a new quality to diplomacy (by science diplomacy) and to profit (by advocating sustainability). By gathering and utilising the best scientific energies in an objective and altruistic fashion, academies can show clearly that the road towards knowledge is one lane of the direct route to intellectual self-determination in democratic societies. In Europe, this implies a responsibility for academies – aware as always of the limits of their inquiries – to contribute with evidence-based studies to enlightened decision-making about societal changes. The dignity of academies should ensure that their advice is valued and trusted.

ALLEA as the European Federation of National Academies of Sciences and Humanities is well-placed to identify and connect all those activities. This may entail complementarity of action by academies, links between them or with other partners, or the strengthening of links with policy-makers and society through joint activities. It may be that national experience will nourish the international community, or conversely that international activities will enhance the national community. ALLEA has been able to demonstrate clearly what can be achieved on a collective basis, and its future activities are planned to build upon that foundation. In the context of the new Europe that is emerging, having a strong voice that articulates the views of the Academies is not just a scientific asset, but should be seen as a cultural and political necessity (see also Christophorou, Drakatos 2007).

The future has already started. The road ahead will not be smooth. We wish our successors and all the member academies the necessary courage and vision to keep pursuing it. *Vivat, crescat, floreat ALLEA!*

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**Part II**  
**ALLEA papers and addresses**



## Discussion paper 2004\*

*Nicholas Mann*

At the last meeting of the Steering Committee I suggested that it would be opportune for the committee to consider ALLEA's development and future role; the President's response was to invite me to submit a paper.

What I am here offering for consideration is not a balanced and formal paper. I have deliberately adopted the role of an *agent provocateur*, choosing to introduce an explicit irritant into our otherwise harmonious deliberations. I must emphasise that it deals with headline issues, not with detail; that it implies criticism of no individual; that it represents my *personal* point of view, and is not intended for circulation beyond the Standing Committee. It is simply intended to spark off what I regard as an essential debate.

### W[H]ITHER ALLEA?

Three propositions:

1. Weakness in numbers
  2. Lack of direction
  3. Schizophrenia
1. **Weakness in numbers.** There are too many bodies purporting to speak on behalf of Academies, Europe or world-wide. Some are better than others, but what is special about ALLEA? Being European? Covering all disciplines? Is there duplication of effort? Is ALLEA pre-eminent? How can it make sure that its voice is heard in such a crowd?
  2. **Lack of direction.** If Academies are to have a voice in European or world affairs, they need a strategic vision to guide them, not merely a series of one-off initiatives, however worthy. Currently ALLEA relies too heavily on the remarkable energy and commitment of its President; this is not sustainable. The activities of the Standing committees and Working groups are not guided by a central strategy, and they do not appear to be accountable.

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\* Internal ALLEA document, November 2004.

3. **Schizophrenia.** A General Assembly which meets once every two years is not an effective body, either in constitutional or in operational terms. It is not capable of taking significant decisions on matters of policy because (a) its membership is not stable (b) it is divided haphazardly between academic and administrative representatives (c) those representatives cannot necessarily speak on behalf of their Academies. Consequently it conducts an unworkable mixture of administrative business and what purports to be an academic conference. In a world already plagued by a surfeit of conferences, there is no justification for one that has no focus, no peer review, and no clear outcome.

### Ways forward?

1. After an initial period of growth and development, ALLEA needs to consider its relationship with other bodies, notably EASAC, and to ensure that it has a unique role. If it does not, and is merely doing what others are doing, then it should not continue.
2. ALLEA must consider the sustainability of its operations without relying on a single individual; it must consider its *modus operandi* if it is to be effective in translating a strategic vision into operational terms; it must be clear what it can achieve and how to achieve it.
3. Either ALLEA is a ‘talking shop’, in which case it needs academic definition and clear goals; or it is a forum for the dissemination and sharing of information, in which case it must meet more often or conduct electronic meetings; or it is a policy-driven lobbying body, in which case it must devise ways of deciding upon policy, and being swifter and more effective in lobbying.

**ALLEA General Assembly meeting, Krakow 2006\***  
**Inaugural address**

*Jüri Engelbrecht*  
President-Elect ALLEA

Dear Mr Past President, dear Pieter,  
Distinguished colleagues,  
Ladies and Gentlemen!

It is an honour and a very special privilege to stand here and address of All European Academies. The acronym ALLEA has much significance for the modern European scientific community.

As already explained by Pieter Drenth in his opening address, the ideas that epitomize ALLEA had been formulated about 15 years ago and ALLEA was officially established in 1994. Now 12 years later, our state of knowing has been much improved – which is characteristic of science.

We live in fascinating times. New research challenges – particle physics, molecular biology, brain research, climate research, energy research, complexity and many more – show promise and the results will without any doubt provide mankind with new knowledge. Knowledge about man and nature, knowledge about society, knowledge to be used in practice. In this fast developing world, academies have an extremely important role in fostering top level research, furthering critical scientific thinking in society and promoting independence and freedom of science. These are the focal points in ALLEA's future Strategic Outlook.

I am privileged to follow the former Presidents Professors Paul Germain, Domokos Kosary, Gerhard Gottschalk and Pieter Drenth. They, together with all the member Academies, have steered ALLEA to where it is at present. ALLEA has a fixed place in the European scientific and scholarly community. Actually, ALLEA's strength comes from this very community or in other words – from understanding scientists' responsibility.

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\* ALLEA General Assembly meeting, March 24, 2006, Krakow, ALLEA Biennial Yearbook 2006, pp. 183-187.

Our Standing Committees and Working Groups do an excellent job. Our statements are formulated after thorough analysis, providing a summary of member Academies. ALLEA publications reflect important findings in science policy, ethics, evaluation and other matters. All this activity is based on fundamental values that have been formulated over centuries of research. ALLEA not only combines the wisdom that Academies have accumulated since the 17<sup>th</sup> century but also the quest for new knowledge which is so important to each member Academy.

I have been involved in ALLEA and other European institutions' activities since 1995. In my own Academy – Estonian Academy of Sciences – the last decade has been full of changes and I have been lucky to be related to the society and academia's dynamic transformation. My own research field is mathematical physics and theoretical mechanics which have old traditions but always produce new ideas. I certainly know that one cannot take the notions from one branch of science and apply these in another; nevertheless, I am sometimes tempted to draw parallels between my own field and general societal activities. One such a parallel is related to conservation laws. In continuum physics these conservation laws emphasize the conservation of energy, momentum, mass etc, all of which are spiced with entropy inequality. Furthermore, constitutive laws describe the diversity of matter. One could, with some licence, say that in research the 'conservation laws' are objectivity, ethics of research and continuous quest for new knowledge at the frontiers of the human mind. By extending this licence, education, infrastructure, funding, etc. become the 'constitutive laws'. Moreover, the quality requirement can in some sense compared to entropy inequality which must always be satisfied.

Another concept from my own research is fractality – the understanding that complex structures can be built by simple rules. I strongly believe that the principal rule in academia is to support the quality of research and train young scientists. Applying this rule steadfastly we could achieve dynamic research structures that will be able to extend the frontiers of knowledge. Whether we call such a system the European Research Area or not, this is not so important.

But let us return to ALLEA. We know that knowledge is Europe's richest resource. Knowledge is an indivisible continuum of physical and biological sciences, the humanities and social sciences and other fields. But knowledge in itself is useless. There must be social interaction and cohesion mechanisms within human institutions in

order to exploit it. This is exactly what Academies and ALLEA as a whole should be ensuring. We have already good experience and Pieter Drenth who passed me the hammer just a few minutes ago, has done a lot to summarize ALLEA's experience. ALLEA's key concerns have been the autonomy and independence of Academies, scientific integrity and social responsibility, social and ethical views in research, quality of research and many other aspects. ALLEA views are formulated against this background. Take for example, the reflections of ALLEA on the 7<sup>th</sup> Framework Programme (issued June 2005). It is not fully positive, offering valid criticism. One proposal, for example, suggested that "socio-economic sciences and the humanities", should be split into two themes. This is an important problem and here I am pleased to report that EURAB has also prepared a long document on humanities and social sciences. Another point that should be stressed with regard to ALLEA's Statement on the 7<sup>th</sup> Framework Programme, is the problem of intellectual property rights. We have a Standing Committee that has tackled this problem and thanks to its detailed analysis, ALLEA was able to focus on key elements of the IPR that should be solved in the nearest future.

Speaking about the future of ALLEA, to my mind, the crucial issue that we face is: how should our potential be employed? Our potential is based on Europe's rich academic traditions, experienced researchers and dynamic young people. Yes, we could start listing our problems and compare European indicators with those in the US, Japan or elsewhere. But now is not the place or time for that and I would like to focus on challenge of using our potential. Aristotle's well-known saying that "The whole is more than the sum of the parts" is also relevant to ALLEA. In our contemporary understanding, Aristotle seemed to be familiar with nonlinear dynamics and dissipative structures.

We have to develop our contacts with other stakeholders in the scientific community. Our unique features – institutional membership, independence, multi-science and multi scholarship character – give us the strong position. We have direct and fruitful contacts with the ESF and EASAC, and also with ISE. Personally the President of ALLEA is an observer at the ESF Governing Council and a member of EASAC. Both these institutions are very dynamic, reacting swiftly to changes in Europe.

The ESF has recently formed a Task Force on Governance and Structure and I have been invited to be a member of this Task Force.

The idea is to improve the structure of the ESF and, exactly as I have voiced with regard to ALLEA, to use the ESF Member Organizations' potential. The ESF is an umbrella institution for Research Councils and Academies, which recently debated on the role of Academies which are not rich funding organizations like Research Councils. The new President of the ESF, Professor Ian Halliday has proposed that Academies' knowledge, not their funds, should be used more widely. In this context, Academies can, for example, steer Forward Looks. I shall certainly keep ALLEA informed of the Task Force's results.

But ESF, EASAC and ISE are not the only institutions with which we need to work closely. In the working document of ALLEA: "Strategic Outlook: Unity in Diversity" we list many other stakeholders. Our links with Inter Academy Panel and the Academies of other continents are also important. We have, in fact, just discussed the possibilities of supporting the African Academies.

In my personal capacity, I am also a member of EURAB which has a small group chaired by Jan Dekker, the President of EARTO, that deals with creating a broad coalition of authorities and organizations working towards Lisbon targets. As you know, EURAB unites academia and industry, ALLEA unites academia. I therefore quite obviously joined this group (called shortly "Plan C"), as cooperation in this direction is definitely required. Again, together with short-term activities, this is the longer-term plan for the future.

Our membership now comprises 53 academies from 40 countries. Nevertheless, due to ongoing difficult transformation processes in some societies, not all European countries are represented in ALLEA. Our duty is to help them to become members of ALLEA. ALLEA should not be only a forum for the member Academies but also a driving force for a knowledge-base European society, accepting the same role in Europe that our member Academies play in their countries. The motto – unity in diversity – captures this mission perfectly. Our strategic outlook needs to be formulated more precisely for the future. Should we have more meetings, conferences, WG meetings or seminars? Should the Steering Committee meet more often? Should the electronic communication be improved?

Ladies and Gentlemen!

From this rostrum I would like to thank KNAW and the Dutch Government for the support to ALLEA. This support has given us an able Office and I would like to thank Hans Schroots and Maarten

Langemeijer for their work. To step into Pieter Drenth's shoes is both easy and difficult. Easy, because he facilitated ALLEA's emergence as a strong institution and set the pace. Difficult, because it will require much energy to carry on and meet the challenges. Unlike Pieter yesterday, I do not have a limerick but I would like to quote a mathematician from Oxford. "It takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that". This is what the Queen said to Alice.

We all strive for excellence in science and scholarship: that is why we have to run fast, but as Academies we must have the wisdom not to hurry, acknowledging the differences in the routes that we have to take, changing things that require changing. I would like to thank you all for your support – I shall do my best to serve ALLEA and the scientific community as a whole. I would also thank the Polish Academies for organizing the General Assembly meeting. Understandably, Krakow now has a very special place in my heart and I am very proud that I take over the presidency in this European centre of culture.

Thank you for your attention.

**Changes in society and values\***  
**International Symposium on “Science, Technology and Human  
Values” Athens, May 2-4, 2007**

*Jüri Engelbrecht*

Mr Chairman, Ladies and Gentlemen,

First I would like to thank the Academy of Athens for inviting me not only for the Opening of this important Symposium but also to give a talk. I was invited to speak about the values in a changing society under various constraints.

Society is continuously changing and human values are polished by changes. Although already Aristotle has said: “Man is the best thing in the world”, the contemporary world gives often different interpretations to it despite the wish to reach more harmonic societal relations. Sometimes this is just semantics which is understood differently. Take for example Humpty–Dumpty’s attitude from Lewis Carroll (182). Alice asked him ‘whether you can make words mean so many different things?’ The answer was ‘the question is, which is to be master – that’s all.’ That is exactly the case when by unfortunate turn of history the ruling masters are telling people what they should think. And this certainly is related to values.

I am going to speak about values in a changing society focusing on one region of Europe – Central and Eastern Europe. During the 20th century this region has suffered from dramatic changes that lasted longer than in most of Europe. But – “no man is an island” (John Donne) and what happened in the CEE countries can not be analysed without changes in all the world and in Europe in particular. Actually one of the best descriptions of changes in European values and people during the first half of the 20th century is given by Stefan Zweig in his fascinating book “Die Welt von Gestern” (1975). Shattered by two WWs, the world of Stefan Zweig (ie the West of Europe) returned to free societal roads after WW II but the CEE countries remained in a totalita-

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\* Talk at the International Symposium “Science, Technology and Human Values, Academy of Athens, May 2-4, 2007, Athens. Proceedings, pp. 217-223 (reprinted with permission).

rian system for another half a century. Surely during this period much has happened in the world. The previous conference on Universal Values (Christophorou, Contopoulos 2004) analysed the situation and pointed out several problems. We all accept that the values from ancient Greece and Rome, Aristotelian and Stoic views have shaped our attitudes of today. Through Christian Europe and Hanseatic League, just to mention some periods in history, we think now about common values in the European Union. The knowledge about the Nature, man, society and technology is much wider and deeper and new frontiers open up fast. However, “he who increases knowledge increases sorrow” (Eccles. 1,18). And, as mentioned in discussions of the previous conference (Christophorou, Contopoulos 2004), we witness also the erosion of values and of diversity together with the growth of inequality in society. Before coming to the main point, let me tell a short story from my own experience.

More than 10 years ago I wrote an essay on the beauty of science. Certainly I checked many encyclopedias and dictionaries on the definition starting from the celebrated Encyclopedia Britannica from 1769. I collected many including such as beauty “is pleasing to the sense and intellect” and “is the combination of all the qualities of a person or thing that delight the senses and please the mind”. My intention was to describe in terms of beauty nonlinear dynamics which is my field of research. From the history of science the ideas of Paul Dirac and Pierre Duhem attributed to the beauty of physical laws are well known. However, in one of the recent dictionaries the entry “beauty” had a very laconic explanation – see “cosmetics”! No comments are needed here.

But now to the main point – values in changing societies and the CEE countries. At the beginning of the WW II this part of Europe stood between two evils – Fascism and Communism. Unfortunately the defeat of Fascism did not pace the road to free Europe as a whole. The Molotov-Ribbentrop Pact (1939) shared the CEE countries between Fascist Germany and Communist Soviet Union and the Yalta Treaty (1945) fixed the spheres of influence almost in the same way. So the destiny of many nations was to be part of a totalitarian system for almost half a century. Europeans know a lot about the Holocaust but much less about Gulags, the deportations and imprisonments of innocent people by the Communist regime. I am not going into a detailed analysis of history but my main question here is – what has such a

period under the totalitarian system done with values and what is the situation now when most of the CEE countries have joined the EU?

We usually take value as a principle that becomes an important definite factor in one's life. Mostly values are emotional categories and put in a very primitive way the main question is to distinguish between good and bad. Here one could start a long discussion about these categories which are understood in many different ways. And I have also different questions on values:

Why and how are values changed or distorted in a society?

How long will it take to change or distort values?

How long will it take if there is a wish to restore values?

One should distinguish between the continuous changes in society which are of step by step nature and sudden or sharp changes related to extreme situations, for example, to wars. Clearly this is the situation briefly described above.

One point to be stressed at once is that in my opinion the most important value for the CEE countries was freedom. This was understood in the way 'for what' while in the US for example freedom is mostly 'from what'. 'For what' means freedom to speak without being punished, freedom to realize one's goals, freedom to behave differently from others, freedom to travel, etc. However, freedom is just one value and there are many of them. At the last conference here in Athens somebody listed up 27 values touched in various talks. What has happened to them through the totalitarian period? I cannot analyse them all but would like to discuss some of the more visible trends.

First, the background. The totalitarian system that governed most of the CEE countries was spiritually very oppressive and brutal. In Estonia the system started with the deportation of many innocent people to Siberia that planted the fear of persecution. Later, words lost their meaning and there was a great difference between words and deeds, official lies were quite usually distributed by mass media, all those who openly declared that they thought or behaved differently from official slogans were brutally treated. And as a matter of fact, several generations could not realize their goals in life or had to lead a double life including the usage of double-speak (see Orwell 1949). Without any doubt, such conditions and the constant moral pressure (not speaking about physical threats) have influenced the value system.

This situation came to an end in the 90s, with little or no blood spilled. The Balkans was certainly an exception due to many reasons.

One could say that the communist machine was internally ripe to break up like an ideal machine in technology. But certainly the values could not be changed overnight.

Clearly this was a challenging field of research that social scientists faced after the changes. Among others, there is a detailed analysis for Estonia and its neighbours: “Return to the Western World. Cultural and Political Perspectives on the Estonian Post-Communist Transition” (Lauristin, Vihalemm 1997).

Quite surprisingly, the summary of this book (Lauristin, Vihalemm 1997) says that “in spite of the Soviet dominance of officially visible societal culture, the older Estonian generations seem to have been able to transfer a basically West-European value structure to their children and grandchildren”. We were lucky that this situation affected only about two generations so that we were able to draw this conclusion.

Where do we stand now with all our values and attitudes? R.Inglehart and C.Welzel (2004) have analysed the values and their changes in more than 80 countries over the timespan of more than 30 years. Their value chart gives an interesting picture of countries constituting certain larger groups characterized by religions or by languages or by other ‘group’ parameters using the idea of moving from restrictions towards free choice. One axis is characterised by authority: moving from traditional authoritative systems towards personal independence and rational choices (secular-rational values). Another axis characterizes moving from survival values towards individuality and diversity (self-expression values). In this map Estonia is quite high with relation of secular-rational values but still in the middle of the area where survival values are prevailing. Other countries with the same fate have rather similar positions. So in this sense, Estonia is close to Protestant Europe, which is not surprising because of our history but quite different in respect to survival values. This is actually the result of being forced to be part of a totalitarian system.

Looking deeper into the situation, the main problem seems to be that freedom is running away from responsibility. Individual freedom is not clearly understood – to be free to have different values and honour them but not being always responsive to the needs of a society – that sometimes creates complications. One could guess that such a situation is due to the speed of changes. And although the traditions have been

passed on through the totalitarian period (see Lauristin, Vihalemm 1997), the present situation is governed by rather pragmatic attitudes.

There is one danger more for values indicated by J.Binde (see Christophorou, Contopoulos, 2004: 91): the erosion of diversity. Indeed, in many EU documents including those on the European Research Area, the diversity of Europe is stressed as one of the main assets. The richness of the culture all over Europe from North to South, from East to West has so many facets and colours. One of the strong cultural tools is the language binding people together and defining ethnicity. And paradoxically here lies also a danger. From the emotional side there is an excellent description by Pentti Saarikoski, a Finnish poet and writer. In his book “The Diary of Bretagne” (2007) he describes himself sitting in a cafe in a small Breton village and trying to learn Breton. He thinks – well, here I am studying a language mastered by not so many people but what is the fate of this and other languages spoken nowadays in Europe (certainly Europe is not the only case)? How many living languages will there be after 100 years? There is a clear need to understand each other in our global world. The lingua franca is English, at least in the academic world. But there are other languages, some spoken by millions and millions, some by a million only or even less. Estonian belongs to the one million category. And now we witness how English creeps into everyday life and jargon. Through the totalitarian period language was a tool for hidden resistance and this is why the conclusions in the volume (Lauristin, Vihalemm 1997) were such as they were. Now there is no pressure and even more, the EU has declared all the languages of the member states to be official EU languages. Nevertheless, the erosion of values involves also the problem of languages. Every language is actually a value and the need to keep such values is obvious in order to preserve diversity. But I do use English for communicating with my colleagues and I am sorry that I cannot speak Greek here.

Ladies and Gentlemen, as I said before, I have many questions but probably not so many answers. Nevertheless, I brought some explanations and ideas to you from a changing and vibrant society which in spite of the problems is optimistic about the future. Before I quoted John Donne on mankind as a whole. And certainly we all together face changes in Europe. Recently, Timothy Garton Ash (2007) has listed the basic values for Europe of today: freedom, peace, justice, prosperity, diversity, and solidarity. But, he stresses, this skeleton of values must

have flesh in order to be acceptable for everybody. Surely those parts of Europe where the wounds of the past are still felt cannot do everything at once, time is needed first to heal the wounds and second, to balance society. The latter is an everlasting process where we all are in the same boat. But without knowing the past, we cannot explain the present and foresee future trends.

Thank you very much for your kind attention.

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## **ALLEA GA, Madrid, 16-18 April, 2008\***

### **Opening address**

*Jüri Engelbrecht*

Your Majesty  
President del Campo  
Distinguished guests and partners  
Distinguished ALLEA members  
Ladies and Gentlemen

It is a privilege and pleasure for me to welcome all of you on behalf of ALLEA. We are in the beautiful hall of the Institute of Spain which is one of the oldest academies in ALLEA, close to 300 years of age. This is the home of a rich cultural tapestry into which science is woven, and which has supported Spain in shaping its present and will support it in shaping its future. The blend of academies within the Institute of Spain – Academy of Spain, History, Fine Arts, Natural and Exact Sciences, Moral and Political Sciences, Medical Sciences, Law, Pharmacy – has enriched our knowledge in all those fields. And the academic traditions over the past three centuries are rich and inspiring.

As always with Academies, we have two aspects: on the one hand traditions of representing, preserving, generating and appraising knowledge; on the other we face a dynamic world and rapid change. This is a real challenge for us and for academies: how can we react to the needs, and how can we make best use of our knowledge?

There are many problems in the contemporary world. Alarm bells are ringing because of global warming, natural and man-made hazards, poverty, disease, social conflict, galloping technology and its aftermath. Perhaps the most important question is how mankind will cope with all of that. As academicians and academies, we must ask ourselves what we can do to generate the knowledge that we need, and how mankind can use that knowledge.

Not everything runs smoothly. Allow me to quote Carl Sagan, the well-known astronomer and populariser of the natural sciences. He said: “We live in a society exquisitely dependent on science and technology in which hardly anyone knows anything about science and tech-

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\* Not published before.

nology.” Leaving aside the scientific community this seems to be true of society in general.

In my field of interest – mathematical physics – there is an important keyword “complexity”. Originating in physics, or more exactly in nonlinear dynamics, this notion is not simply something we call “nonlinearity” – a professional term hardly understood by laymen. It is in fact a holistic view of the world – in physics constituents are coupled, in biology cells and organisms are made of interacting parts, in our social life we all depend on our neighbours. “No man is an island”, said John Donne. We cannot live alone; what we do affects our closest partners first and then society at large. And what society does affects us. We could model complexity mathematically, which gives excellent results. But mathematics alone do not govern the world: in many (if not most) cases we are not able to describe causes and outcomes in terms of mathematics. But mathematics can help to build an understanding and to see hidden links and patterns. The problems may have multiple solutions, and all of these may be correct. Small changes today may cause large changes tomorrow. And Aristotle already knew that the whole is bigger than the sum of its parts. This understanding could be a backbone for Europe: diversity of cultures, diversity of languages, diversity of geography, diversity of ideas – all that summed up and spiced with the will to live and act together is much more than a series of simple sums.

27 member-states in the EU, 53 academies in ALLEA – these are just figures. Our Federation is not only made up of academies, but also of the fellows (running to thousands) elected for their merit and excellence in research, and sharing ideas that they value.

Ladies and gentlemen – if we start from the Accademia dei Lincei, founded more than 400 years ago, there is a huge potential for preserving traditions in research, promoting knowledge, advising society and governments. And let me remind you that the Lincei was founded by young and inquisitive minds. We could of course go even further back into history: the *Akademos* of Plato has shaped our thinking for more than 2000 years. It is interesting to note in addition that *Akademos* advised society and rulers on different issues, and sometimes even refused to give advice.

The role of academies in the contemporary world is multifaceted. Academies are the strongholds of knowledge, they represent indepen-

dence of thought, they generate new ideas, they advise society on complicated issues of nature, technology and societal problems.

My question now is: are we able to use all this wealth of knowledge, which cannot simply be measured by GDP figures or by numbers of published papers. Bureaucrats certainly like these indicators, but they scarcely scratch the surface. It is not the bulk of scientific production but the quality of research that counts, and we must place it in the context of our social and natural environment.

But let me turn again to our host. Today we are in Madrid, which has been a nodal point for culture and science over the centuries. Contemporary geneticists claim that humans started to inhabit Europe from two areas – Iberia in the West and the Black Sea area in the East. They moved to Central and Northern areas of Europe following the melting of glaciers roughly 10,000 years ago. The most recent findings have shown that humanoids inhabited Iberia much earlier: the Sima del Elevante, Atapuerca, emerges as the oldest most accurately dated record of human occupation in Europe, some 1,2-1,1 M years ago.

This area has been a melting pot of cultures; we look forward to learning more about that at a special session of our General Assembly. Multiculturalism and multilingualism have been hallmarks of the European identity in this area throughout history, and are a rich terrain for investigation.

European identity might need northward, southward, westward and eastward dimensions. I leave aside where the heart of Europe is, and whether it is a geographical centre or a political one, or perhaps even more important: a centre of values without links to geography or to political powers.

Do we know enough about each other? Do we know where we are going together in research – into physical fields and CERN, into genetic complexities and EMBO, into societal problems? Broad perspectives are needed and that is where academies have much to contribute. There are now fewer borders in Europe, but boundaries still exist. Borders are like walls, boundaries are lines indicating differences, be it of traditions, social structures, or economies. Nevertheless, I would like to see Europe as a continuum. Research is without any doubt a glue that holds this continuum together. Academies do not deal only with science *per se* – academies put science and research into a wider cultural context. Looking ahead, Miroslav Hroch from the Czech Republic has indicated several areas where the impact of science is important: the high

value of education, collective memory as an integrating force, solidarity and social justice, Europe as an ideal concept, and Europe as rational thinking.

In all fields of research, and of society, there are multiple challenges. There is no need to list them all. ALLEA has issued several documents on science policy, 13 leading academies of the world, including five ALLEA members, have issued a statement on growth and responsibility addressed to G8 governments. In a changing world, there are always new problems and ideas. And when I speak about the academic world facing these challenges, I mean of course not only the academies, but universities, research institutions and the scientific community as a whole.

I would like to invite you all to discuss these problems during the sessions and at our Business Session. In my view, ALLEA is a strong player on the European scene and not only locally – our contacts worldwide with the IAP and IAC have also been strengthened. We work as a Federation, careful to pay attention to regional cooperation. Our two Standing Committees do excellent work on Intellectual Property Rights and on Ethics and Research Integrity. They will report to the General Assembly. Here I would like to emphasise research integrity as the global responsibility to foster common standards in research. The recent survey among ALLEA members has revealed the extent to which academies foster ethical and responsible behaviour in all their actions.

We work intensively with our partners, with whom we share values and ideas. Strong cooperation with the ESF, EASAC and IAP gives us opportunities for joining forces and sharing experience while reaching a wider audience. We have also signed a Memorandum of Understanding with the Network of African Academies, and there are many plans for the future. I shall give a more detailed report on ALLEA activities tomorrow at the Business Session.

Some closing remarks on values and powers. Our society is very involved with economic and also military powers. But we expect soft power, which is related to values, to increase in importance. Last year, the Academy of Athens organized a Symposium on Values related to science, technology and humanity. We might ask if soft power is merely a dream. Is it a dream to hope that Europe is, or will become, a society of values supported by solid scientific information and rational decision making? It is not enough to have a dream: we have to be able

to make it come true. George Bernhard Shaw said: “Activity is the only road to knowledge”. I think this is the way forward for ALLEA, for academies and for all the academic community.

Thank you, Your Majesty, for honouring European academies with your address. Thank you, President del Campo for inviting us to Madrid.

I would also like to thank all those participating in the GA, and I am looking forward to interesting sessions and stimulating discussions.

Thank you for your kind attention.

## **ALLEA in 2006-2008\***

### **Report to the General Assembly, April 2008, Madrid**

*Jüri Engelbrecht*

This is a summary of the Report to the Business meeting of the ALLEA General Assembly held in Madrid in April 2008. It covers the period from the last General Assembly meeting in Krakow (2006) to the present date, April 18, 2008. During this period, ALLEA has published the Biennial Yearbook 2006 and the Annual Report 2007. Many events and statements were described within these covers, which is why below only brief remarks are needed to describe them. More attention will be paid to some of the general ideas developed in the course of those and other meetings.

The Biennial Yearbook 2006 included the texts of talks given at the academic sessions of the ALLEA General Assembly in Krakow, reports from the Standing Committee on Science and Ethics and the Working Groups as well as speeches of the outgoing and incoming Presidents. Seven academy profiles were given. The Annual Report 2007 included, besides the factual materials, also the ALLEA Statement on the European Research Area (ERA), an essay on social sciences and the ALLEA Strategic Framework.

Starting from the General assembly in Krakow, the most important task for the new Presidency and the Steering Committee was to develop a Strategic Framework for the coming years. Action Plans for every year should permit a forward planning and reflect the current activities. In addition, the Presidency invites Memos from all the meetings where ALLEA was represented. ALLEA continued to take active part in supporting academies in their science policy statements.

### **The Strategic Framework**

After in-depth discussions in the Steering Committee, a short text was agreed which describes the mission, vision and position of ALLEA in Europe and worldwide, listing also the modes of action. The text has

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\* ALLEA General Assembly meeting, Madrid, ALLEA Biennial Yearbook 2008, pp. 81-87

been published in the Annual Report 2007. The final part of the strategy document describes how ALLEA will promote the Europe of knowledge. Along these lines ALLEA:

- issues science policy analyses and statements and supports Pan-European joint activities;
- develops opportunities for cooperation between academies including cooperation at regional level;
- promotes the development of the ERA and stresses the role of excellence in research;
- develops joint activities with other partners striving for excellence and research integrity;
- promotes together with its partners public awareness and understanding of scientific issues;
- aims to set international values and standards in collaboration with partners;
- develops a role in the process of evaluating for science;
- develops a service to keep its members up-to-date on developments in science policy in Europe and worldwide;
- enhances the exchange of information between its members, especially on science policy and advisory issues.

All these are only some parts, albeit important ones, of building the European Research Area. Together with partners, ALLEA agreed during a Workshop “European Organisations on Cooperation in the ERA”, (The Hague, 15.12.2006) on possible actions, which in turn provide principles that underpin progress towards a knowledge-based society:

- only a world-class research environment can guarantee progress towards the goals of Lisbon and Barcelona;
- there is a need for a political will to develop ERA but this will must be fed by the scientific community;
- education at all levels including that of policy-makers plays an important role;
- the self-organization of research communities should be encouraged;
- for scientists, sustainable career-paths are important, and should include return, promotion, open opportunities, etc;
- in the competitive and dynamic world, research organizations should clearly define (and redefine, if necessary) their role and targets;

- regional partnerships should be strengthened by clusters of European and worldwide co-operation;
- the effectiveness of programmes should be enhanced with attention to their “pulling” effects;
- attention should be focused on dismantling the barriers in research (barriers between the Member States, different schemes, etc);
- public and private partnership in funding schemes and joint programmes should be supported.

### **ALLEA Statements**

An important part of ALLEA activities in the reporting period are position papers and statements concerning European science policy. These documents are based on opinions gathered from the member academies, and synthesised by the Steering Committee and Presidency. Such position papers include reflections on the Framework Programmes and other EC activities.

Two recent documents should be mentioned: “Challenges of the Future: Reflections of ALLEA on ERA”, (2007); “Reflections of ALLEA on the EC Green Paper 2007” (2008).

The first document was issued before the European Commission has published their Green Paper in 2007. It stressed that cooperation and complementarity are important issues and that a balance should be achieved between exact sciences and technology on the one hand and humanities and social sciences on another. The self-organization of research cooperation and of clustering processes are identified as important. Emphasis is also placed on the need to support regional cooperation. Barriers that still exist within the European Union and on the larger scale should be removed to enable the free movement of researchers and students.

The second document which refers specifically to the European Commission’s Green Paper agreed on the instruments listed and explained in the Green Paper, but stressed some of the basics underlying the use of those instruments: the European Research Area should be based on the understanding that research matters! It matters because it is a vital part of the social tapestry of a modern state and in this point ALLEA and the League of European Research Universities (LERU)

have similar views. Research not only contributes to innovation and to economic development, it is about man, society and the world, about culture and human perception, about inquiry into phenomena; it is a response to societal problems, to natural hazards and to climate change, a way to improving health and education and so on. ALLEA stressed that such are the principles that are to be recognised as the basis before the instruments themselves are listed. ALLEA also stressed that normative prescriptions as to the content of research must be avoided, and that, rather, the European Commission should work as a catalyst. Many other, equally important points can be gleaned from a direct study of the document. However, it is stated that Academies have an important role in the ERA as strong advocates for excellence in research. Theirs is an advisory role vis-à-vis society and governments and they play a central role in fostering international cooperation. In this process of building the ERA, ALLEA is able to marshal the voices of its members and to speak with authority on the behalf of the academic community.

### **Science policy meetings and conferences**

ALLEA organised a conference “Emerging Regional Cooperation. Southeast European Academies of Sciences and Humanities in the ERA” convened in October 2007 in Amsterdam at the Royal Netherlands Academy of Arts and Sciences (KNAW). The goal of the conference was to strengthen the scientific and scholarly co-operation between the academies in South-East Europe and the other academies in the ALLEA family, to address common and societal topics and to share experience from EU-level and regional collaborations. Altogether 21 academies and the representatives from the EC, ERC and ESF took part in the conference. The experience of the academies of France, Sweden, Austria, the Netherlands, Estonia, Latvia and Slovakia was analysed and the problems in the SEE countries were discussed. The materials from the conference together with a summary were published in 2008 as an ALLEA Report (No 5: Emerging Regional Cooperation. Southeast European Academies of Sciences and Humanities in the ERA).

Another important meeting was the ESF/ALLEA Workshop “Strengthening the role of Academies in the ESF” (Brussels, 7 March 2008). The overall aim of this Workshop was to continue the dialogue between the ESF and its member academies. In May, 2007, the ALLEA

President and the ESF Chief Executive had jointly invited academies that are members of both the ESF and ALLEA, to provide their views and expectations on the role of academies in the ESF and the role that the ESF could play for the academies. The questions addressed to the academies involved the issue of ‘ownership’ of the ESF, views on activities and instruments of the ESF, visibility of academies in the ESF, the role of the ALLEA , etc. 19 academies are members of the ESF out of a total 75 members. The ESF is thus a unique blend of research funding agencies, research performing organisations and academies (of both types, learned societies and research performing academies). The ESF Strategic Plan 2006-2010 lists the main goals of the ESF: to advance European research and explore new directions for research at the European level. ALLEA has formulated the Strategic Framework 2008-2010 addressing the goals of academies in Europe, mostly within policy of science at the large scale. One of the goals for ALLEA is also to promote partnership with other European institutions whose goals are similar. This is the reason why the Workshop brought together ESF and ALLEA.

The responses of 14 academies to the questionnaire were received and an analysis of their views was included in the Workshop materials. Several general talks were given and four academies presented their views directly at the Workshop. The talks were followed by a discussion. Altogether 13 academies were represented at the Workshop alongside the presidencies of ESF and ALLEA.

The general ideas discussed can be divided into (i) joint activities of ESF and ALLEA; (ii) improving information links; (iii) influence of academies; (iv) ideas for future.

(i) joint activities of the ESF and ALLEA:

- Research Integrity Network: a joint application was prepared to be submitted to FP7 is prepared, with esf being the main applicant and ALLEA being responsible for one Work Package;
- European Reference Index for Humanities (a pilot project for possible bibliometric database for the Humanities): the academies had been invited to cooperate and in some countries had coordinated or provided national input to the project;
- Guidelines for Peer Review/Evaluation – cooperation between ESF and ALLEA should be supported in the future;
- the role of academies in the development and assessment future Forward Looks should be enhanced;

- the project “European Young Academy” could be developed jointly;
  - proposals are invited from academies for ESF instruments and conferences, including notably the 2nd Europe-Africa Conference (March 2009);
- (ii) improving information links: websites could give direct links to important statements and documents; existing contacts should be used to meet other stakeholders;
- (iii) influence of academies as associations of leading scientists must be improved in all ‘umbrella-type’ organisations, including the ESF. The Science Advisory Board of the ESF might rely more on the potential of academies. ALLEA is given a strong mandate by academies to represent them in the ESF (the ALLEA president is already an observer at the ESF Governing Council).
- (iv) future activities: among the challenging topics to be addressed are the vision and landscape of the European Research Area beyond 2013 (FP8) which needs full attention, as well as the future of scholarly publishing. Several academies have established Young Academies: this trend could be strengthened as one way to give an impetus for young excellent researchers in their careers.

### **Exchanges with other networks**

The ESF is not the only important partner for ALLEA. One should also stress the relationship between ALLEA and EASAC: EASAC is supported by the EU-based science academies and Academia Europaea and produces excellent and well-focused reports on various issues (“Science for Policy”) that were well received by its audience, notably the European Parliament and other policy-makers. The clear profiles of EASAC and ALLEA allow us to share responsibilities, with ALLEA activities focusing on what has been described as “Policy for Science” as witnessed with the abovementioned wide-ranging science policy statements on the European Research Area and on the European Commission’s Green Paper.

Contacts with the Interacademy Panel (IAP) are progressing. ALLEA was invited to chair the Programme Committee for the Conference “Core Competencies for Success in Research – Moving Beyond Scientific Training”.

An ad hoc ALLEA Committee for Partnership has just been launched in order to analyse the possibilities for partnership with several European umbrella-type organisations with whom ALLEA shares views and with whom it might be useful to foresee joint actions in the future. Formally, ALLEA has direct links with the EASAC (reciprocal representation in the Council and the Steering Committee, respectively), and the ESF (the ALLEA President is an observer at the ESF Governing Council). In his personal capacity, the current President of ALLEA was the member of the EURAB 2 (European Research Advisory Board), is a member of the Steering Committee of the Complexity-NET and serves several EC ad hoc committees.

### **ALLEA presence at science policy meetings**

ALLEA has taken part in many conferences in Europe and worldwide. Some of these occasions are listed below. Usually there was a possibility to present ALLEA views or elaborate on special topics like universal values in science (Athens, 2007), research integrity (Lisbon, 2007), advisory role of academies (Amsterdam, 2008; Berlin, 2008), etc.

At meetings of the informal round-table called Platform of European Science and Technology Organisations (PESTO), ALLEA has taken part in formulating the document “Creating an attractive research climate – actions to improve opportunities for researchers in Europe”.

Separate oral reports were presented to this General Assembly by two ALLEA Standing Committees on Science and Ethics and Intellectual Property Rights, which is why their activities will not be reflected here.

During this meeting I would like to invite the member academies to discuss the plans and challenges of ALLEA for the future. Let me therefore finish with some general reflections. As I said before, the role of academies in the contemporary world is multifaceted, related to preserving, generating and disseminating knowledge notably new knowledge. Given the challenges facing the contemporary world, the advisory role of academies is growing more and more important: here, the independence of academies is an invaluable asset. In order to guard this academic value, ALLEA had issued also two statements supporting the independence of two Member Academies (Russia and Albania)

where the political wishes of governments were not in line with the understandings of academies. ALLEA looks to the future with great hopes in fostering the knowledge and building on the understanding that ‘research matters’ which is fast becoming a guiding principle across the world.

Finally, let me thank all the ALLEA members for their cooperation, the Steering Committee for its increasingly active role in ALLEA, the Standing Committees and the Working Groups for their rich portfolio of activities, the organisers of ALLEA meetings in Krakow, London, Istanbul, Amsterdam, Berlin and Madrid. Special thanks go out, as always to the KNAW for the support it gives to the ALLEA Secretariat.

Last but not least, many thanks to the Institute of Spain and its President Salustiano del Campo, for organising this royal meeting in Madrid!

**ALLEA Publications 2006 March - 2008 April:**

1. Biennial Yearbook 2006. New Perspectives in Academia. ALLEA, 2007.
2. Annual Report 2007. ALLEA, 2008.
3. Challenges of the Future: Reflections of ALLEA on ERA. ALLEA, 2007.
4. The Ethical Commitment of Scientific and Scholarly Academies. ALLEA, Standing Committee on Science & Ethics, 2007.
5. Reflections of ALLEA on the EC Green Paper 2007. ALLEA, 2008.
6. Emerging Regional Cooperation. Southeast European Academies of Sciences and Humanities. ALLEA, 2008. (Report Series; 5).

# **Towards a European Young Academy\***

*Nicholas Mann*

## **Origins**

The project of a European Young Academy as a novel measure of support for leading young scientists and scholars in Europe arose from discussions at the 1<sup>st</sup> high-level meeting, held in Brussels in March 2008, between ALLEA, the European Science Foundation and the presidents of those Academies that in 2008 were members of both organisations. The meeting looked at ways in which activities of Academies could bring innovation to the funding streams of research funding agencies – whether national or European – and inject new thinking into their forward planning. The project “Towards a European Young Academy” was subsequently discussed by the ALLEA General Assembly and endorsed and further developed by the Steering Committee later in the year.

At the same time, and following discussions at the global organisation of science academies, IAP, in Canberra and later in Amsterdam in spring 2008, the ALLEA President had been asked to head, on behalf of IAP, the committee preparing a conference for young scientists under the age of 40, tentatively entitled “Moving Beyond Scientific Training”. Eventually, this project led to exchanges with the “World Economic Forum”, which enthusiastically adopted the idea, and adapted it to create the first encounter of young science, business and political leaders at the “Summer Davos” meeting that it sponsored in Tianjin, China. In the meantime, and following exchanges with both ALLEA and IAP, the participants at this and subsequent meetings in China have taken steps to develop the idea of a Young Academy at the global level.

## **Rationale**

Throughout 2009, ALLEA and its Member Academies discussed the establishment of Young Academies, and in particular the possibility of

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\* ALLEA Yearbook 2009, pp. 6-12, later progress added.

creating a “European Young Academy” (EYA). The rationale for exploring the concept rests on two fundamental convictions: the unique value and particular role and responsibility of National Academies in the landscape of national and international research organisations, and the unique value and potential contribution to the future of Europe and its science base of scholars and scientists in the early stages of their careers.

Academies have traditionally promoted, and through their members or their institutes conducted, research of the highest quality. They are frequently called upon to give scientific advice to government and other stakeholders, and can be relied upon for the excellence and independence of their opinions. At the same time they provide, within the national communities of researchers, a platform for exchange across a wide spectrum of disciplines, stretching from the natural sciences to a range of social sciences and humanities. Yet the world in which Academies operate is in a state of flux and rapid change. New forms of research and ways of conducting it are emerging; new fields for research, often generated by the very process of interdisciplinary exchange which Academies have fostered, are constantly arising, and the framework within which research is pursued is being fundamentally challenged and changed by the new supranational structures – of which the European Research and Higher Education Area is but one example.

Last but certainly not least, societies are facing choices and individuals are being asked to express preferences, the outcome of which will have a profound effect on what kind of science will be needed in the future. These changes – social, scientific and political – characterise and often reflect an expanding and maturing European Union, its political and institutional commitments, its values and visions for the future. They also can have profound effects on the neighbouring regions of non-EU member countries.

## **Process**

In this context it is essential that ways and means be found to give to the next generation of scientific leaders – scholars and scientists at a relatively early stage in their careers – the opportunity to contribute to the Europe-wide discussions, across linguistic, cultural and disciplinary boundaries, of the future environment, progress and impact of research.

A survey of ALLEA members conducted in 2009 revealed the extent to which awareness of this need had already given rise, in the various national contexts, to a diversity of solutions for supporting and giving a voice to young researchers, ranging from early career research fellowships (as for instance in the United Kingdom) and young researchers support schemes (such as the one promoted by the Turkish Academy of Sciences) to fully fledged Young Academies (notably those established in Germany, the Netherlands and Austria). A more detailed account of some of the insights gained from the survey is given in an extended chapter in the ALLEA Yearbook 2009.

The logical sequel to the survey was to continue exchanges with the original and potential future partners in the project such as ESF and IAP. We also pursued the learning process by gathering further information from the existing national Young Academies and from other associations, initiatives and lobbying groups of young scholars and their networks, and by drawing on their experience.

This led in particular to interaction in 2009 and 2010 with such groups as EuroDOCs, and with networks of beneficiaries and alumni of funding schemes for young researchers such as the Marie Curie Fellows Association, the EuroHORCs/ESF's European Young Investigators Awards (EURYI), the European Research Council's Starting Grants, and the young fellows of the Institutes of Advanced Studies. Contacts were also made with the other European Academy networks (such as EuroCASE and FEAM), with Academia Europaea, and finally with global organizations, including WAYS (the World Association of Young Scientists), the fellows of the Lindau meetings of Nobel Laureates, TWAS junior scientists' networks, and the fellows of the IAP/WEF-sponsored new champions meetings in China.

As a first concrete step towards developing the concept of a European Young Academy, ALLEA and ESF agreed jointly to sponsor a workshop at which young scholars and scientists of the calibre which might be expected of the future members of such a body would be able to provide their input into the planning process. This duly took place in Vienna in June 2009 at the premises of the Austrian Academy of Sciences. The twenty or so participants, young researchers chosen through a competitive selection procedure from a wide field of applicants who had responded to an open call, and representing a broad range of national backgrounds and disciplines, discussed the potential role of a European Young Academy and were invited to summarise their conclu-

sions in a statement. This document contributed substantially to the formulation of the subsequent vision document which, after discussion by the Steering Committee, was presented to the ALLEA Extraordinary Strategy Meeting in November 2009.

## **Principles**

Key features of the vision thus elaborated were that the EYA should be an independent and virtual body – i.e. without institutional allegiances, and without premises of its own. It should aim to give a select group of the very best early career researchers in Europe – identified through the excellence of their scientific track record, and by their willingness to engage with science policy matters – the opportunity to contribute critically and constructively to the process of building the European Research and Higher Education Areas. Through its membership EYA should embody and promote the notions of academic excellence, independence and freedom. It would contribute to science policy debates on any topic that members chose, or that required their intervention. It should increase the visibility of European research, its quality and relevance to culture and society, through new forms of public outreach activity. It should also provide an unusual (sustainable, and yet flexible) forum for intellectual exploration and experiments that could enhance the potential of scientific collaboration across disciplinary boundaries. It was believed that in this way an EYA could contribute significantly to the emergence of new forms of communication in the dialogue between science and society, not only in a European context, but ultimately in a global one.

As discussions with Member Academies and other stakeholders continued throughout 2009, it became clear that there were a number of critical issues on which the success of the EYA would depend.

The first of these was its independence: while the support of parent Academies was essential, as the German and Dutch examples had shown, it was equally important that any Young Academy acquire from the very outset independence from the bodies which had helped to bring it into being; at the same time, for a European Young Academy, its relationship to existing or future national Young Academies would need carefully to be determined to avoid any sense of duplication or competition.

Second, while it was generally agreed that application for membership of the EYA should be open to all (subject to age-limits), and that after the initial identification of the founder-members the membership should be capable of self-renewal according to agreed criteria, it was equally clear that the credibility of the membership would depend upon a selection process that achieved a reasonable balance of disciplines, nationalities and genders among the outstanding young researchers chosen. Given the potential size of the field of candidates Europe-wide, this was likely to pose significant challenges. It was therefore agreed that in addition to the two principal criteria of academic excellence and ‘doctoral age’, the country of provenance might also be taken into consideration in the selection process, as would certainly a commitment on the part of candidates to engage in the public discussion of issues of policy; only in this way could the EYA fulfil that part of its mission that was to give representatives of the new generation of scholars and scientists a voice in the debates that will form the future of Europe. Subsequent discussions further refined these reflections, suggesting – as a practical measure – that a set of national and European benchmark awards be identified which might serve as an entry criterion for candidates; these might for example comprise, at the national level, key scientific prizes or awards for young researchers, or, at the European level, the starting grants of the European Research Council. Evidently, such a set of pre-selection criteria would need to be agreed upon by all participating sponsoring member academies.

It was further envisaged that the EYA would be a virtual academy without a physical seat, though it would be supported by a small permanent secretariat hosted by one of the ALLEA Member Academies. Governance and administration should be as transparent and light-weight as possible, and care should be taken that any responsibilities that might evolve with regard to the management of EYA should not interfere with the research of its members. The same would be true of the activities of the EYA, which would in due course be determined by the members themselves. Their responsibilities and terms of office would also need to be defined with a view to enhancing rather than obstructing their professional careers, while at the same time promoting the wider aims of the EYA.

For these aims to be translated into reality, a certain number of conditions would need to be met.

First, the moral support of Member Academies was considered to be essential, both in terms of lending credibility and scientific respectability to the exercise, and in terms of the aim of EYA to revitalize Academies. This support should be expressed not only by a formal vote of approval at the ALLEA General Assembly, but also by a commitment to participate in the process of involving other potential partners and of approaching possible funders.

Second, it was deemed appropriate to expect financial support from at least ten Member Academies prior to launching any further fundraising. The figure proposed for such financial contributions was an equally symbolic € 10.000 per annum for a five-plus-one year cycle. This sum, it was argued, was needed both to underpin the launching of the EYA prior to any fundraising, and to give a clear signal of Academy ownership of EYA (and, hence, of the underlying values of scientific excellence and intellectual independence) that would enable the ALLEA Presidency to initiate that very process of fundraising from independent external sources.

It was estimated that, in addition to start-up costs of c. €100k, the minimal annual running costs of the EYA, assuming an initial membership of 50 fellows, would be of the order of €600k. Funds would not usually be awarded in the form of individual research grants; rather, this sum would cover the costs of basic activities and events, of seed funding for new collaborative initiatives, and of the secretariat with the necessary support in terms of information technology and public relations.

It was proposed that, if all the above-mentioned conditions were in place, the selection process could be launched as early as the autumn of 2010, with the announcement of the names of the first fellows in the summer of 2011.

## **Timeline**

The ALLEA Extraordinary Strategy Meeting in November 2009 continued to show great interest in the project, but expressed its wish that the work of consultation and exploration should continue, first through a consultative workshop with Member Academies to be held at the premises of the *Instituto de España* in Madrid in February 2010, and then through a second brainstorming workshop of young scientists se-

lected by Member Academies themselves and to be hosted by the Turkish Academy of Sciences at Antalya in March 2010. These events – and their results – which are a natural extension of the work done in 2009 were also reported in the ALLEA Yearbook 2009.

The workshop for delegates from the presidencies of Member Academies and held in Madrid in February 2010 discussed details of the project against the background of the plans of Member Academies at national level. Delegates presented the state of thinking on these issues in their respective countries, and had an opportunity to compare the concept of the EYA with the roles and remits of other networking and lobbying organisations of young scientists.

The second brainstorming workshop of young scientists held in Turkey brought together a select group of young researchers and a handful of senior science policy makers at national, European and global level to revisit the rationale behind some of the issues and the processes of strategic planning and priority setting in science policy, and to explore whether a young academy could propose alternatives. As a first step towards equipping representatives of the next generation of leading scholars to play a role in the ongoing debates and to articulate their vision of the structures needed for the future, the issues addressed might for example include the kind of science needed for the future of mankind (grand challenges) and the design of research foresight processes.

### **Developments in 2010/2011**

As the General Assembly drew back from recommending a further implementation of the European Young Academy as discussed above, others took the initiative to move ahead, making the best of the insights won and the proposals issued as result of our brainstorming and consultative workshops and meetings.

First, the German *Junge Akademie* celebrated its 10<sup>th</sup> anniversary by holding an interdisciplinary symposium entitled “Between Nations and Disciplines” in June 2010 in Berlin together with scientists from *De Jonge Akademie* (Netherlands) and *Junge Kurie* (Austria), but also from upcoming young academies and from the ALLEA brainstorming workshops. The conference was modelled on the “Frontiers of Science” meetings of the Royal Society, but was deliberately designed as an

interdisciplinary conference also involving the social sciences and humanities. And unlike ALLEA and IAP meetings – where typically members of the Young Academy Boards would exchange views – this celebratory symposium brought together regular members. The German Young Academy also took the initiative of organising the 1st German-Arab Young Scientists Forum one year later in Berlin, in June 2011. The Forum gathered some 60 German and Arab participants and, as the ‘Arab Spring’ continued to unfold, discussed the transition in the domain of science and technology and the means of reinforcing scientific cooperation between Germany and the Arab world. The Forum decided to elaborate a proposal aimed at institutionalising the cooperation between *Die Junge Akademie* and the Arab-WAYS through a joint network of excellence.

As had been announced at ALLEA’s consultative meeting of Member Academies in Madrid in March 2010, a number of national academies, among them the Royal Flemish Academy of Arts and Sciences of Belgium under the presidency of Dominique Willems, are in the process of establishing new national Young Academies. The Belgian project is based on an assessment of the needs of the existing doctoral schools and post-docs; a Young Academy would seek further to advance standards, creativity, interdisciplinary exchanges and science policy debates, and to enable the best young researchers in Flanders to network better with their peers abroad. The different Flemish Academies (KVAB, KAG and KANTL) would be expected to work together in the launch of this project.

The Royal Danish Academy of Sciences and Letters launched a Young Academy early in 2011. An open Call for candidatures was launched and it is expected that the list of founding members will be announced in September 2011.

The Royal Swedish Academy of Sciences, too, established a new academy for excellent young researchers in all disciplines. At the foundation event on 27 May 2011, the first 22 members – elected by the classical Academy – were announced and could present themselves. The Swedish Young Academy will function as an interdisciplinary forum and science policy platform for some of the best young researchers in the country. Indeed the Swedish Young Academy was quick to issue its first science policy statement with a response submitted to the consultation on the European Commission’s “Green Paper on a Common Strategic Framework for future EU Research and Innovation Funding”,

demanding an increase in funding for the ERC and for high-risk breakthrough research, a closer involvement of young scientists in priority setting exercises, as well as, in the area of career development, a streamlined European tenure track system, measures to reconcile scientific careers and family life, and a further globalisation of mobility schemes.

With the establishment of the Young Academy of Scotland, the Royal Society of Edinburgh, Scotland's National Academy of Science and Letters, seeks to give a select group of talented and creative young academics, business people and professionals an opportunity to interact across disciplines and occupations and to become an integrated part of the community of decision makers, opinion formers, funding bodies, national institutions, the public and the media in Scotland, the UK and internationally. The Academy is envisaged to become part of a growing movement among national academies across Europe to establish Young Academies. It will be the first of its kind in the United Kingdom.

In Europe, the ALLEA President had useful exchanges with the European Research Advisory Board, which reacted positively to the idea of establishing a European Young Academy. Meanwhile in 2010 the European Commission set up a European Young Innovators Forum, seeking to give a voice to a community of young innovators and experts who believe in taking risks, and in the value of shared ideas and professional mentorship. Finally, independently of the EYA initiative, a number of young scientists (ERC award winners) have created an Academy of Young Scientists in Europe in 2011.

In the global arena, the ALLEA vice-president and executive director informed and followed the process with their presentations at meetings in February 2010 and 2011 which, with further support offered by IAP and by the German Academies (secretariat), contributed to the creation of a Global Young Academy. This group has grown out of the alumni network of academic participants at the World Economic Forum "New Champions" meetings in China, and is now seeking nominations from Academies the world over. Following the last meeting in Berlin, the former President of the U.S. National Academy of Sciences Bruce Alberts argued the usefulness and role of Young Academies as follows in a *Science* editorial (vol. 332, 15 April 2011, p.283): "By bringing together outstanding scientists from many different disciplines, Young Academies catalyze the formation of multidisciplinary scientific collaborations that generate innovative new discoveries. Par-

participation in a Young Academy also strengthens a nation's scientific enterprise by training its next generation of leaders. The work exposes them to important policy issues while building networks of trusted personal relationships that can bridge disciplines for a lifetime. And by providing a shortcut for outstanding young scientists to exert national leadership, Young Academies can be highly effective in recruiting a nation's most talented students to scientific careers – a critical issue for the future of every nation. By fusing the promotion of the larger goals of science with an integration of young scientists into public service, the Young Academy movement is well positioned to drive the creation of the tolerant, rational societies that the world so badly needs.”

If in the course of 2009 and 2010 some significant progress had been made with ALLEA's project “Towards a European Young Academy”, the General Assemblies in 2010 and 2011, grappling with the adoption of new statutes and the financial plan for ALLEA's core operations, were in no position to decide to move ahead with the establishment of the European Young Academy. This presidency remains nonetheless convinced that a European Young Academy would have the potential both to benefit and promote young scholars and scientists who will be the scientific leaders of the future, and to enhance the processes whereby Europe can plan for that future.

Perhaps Member Academies should extend the initial timeline for the realisation of the project, since they require more time to reflect on how to accommodate the project with their domestic plans for possible changes in the support that they give to young researchers. But we have also seen that others are ready to take bold steps forward. The project “Towards a European Young Academy” has developed through multiple rounds of consultations and debates with Member Academies, partner organisations in Europe and worldwide, and has benefited from the input of groups of young researchers, national young academies and political stakeholders. There is now ever-widening support for the idea of establishing Young Academies at national level. By the same token, the case for an authoritative and independent group of young scientists, reflecting and pronouncing on topical policy issues with regard to higher education, science, technology and innovation at the European level seems just as compelling. Whatever the eventual outcome of these efforts, the involvement and contribution of Academies as leaders of discussions and as guarantors of excellence and independence – past, present and future – is emblematic of the role that they can play in the

shaping of the European Research and Higher Education Areas. It is now up to ALLEA's Member Academies to decide whether they wish to lead such a development by formally launching the process of establishing a European Young Academy.

**Academies in the world of science and knowledge\***  
**Israel Academy 50, March, 14-17, 2010 Jerusalem**

*Jüri Engelbrecht*

“The Temple of Science is a multi-faceted building.”  
A.Einstein

Mr.Chairman, Ladies and Gentlemen

It is a privilege and an honour to speak at this important conference which marks the Jubilee of the Israel Academy of Sciences and Humanities. On behalf of ALLEA I would like to congratulate the Academy on this anniversary – 50 years of excellence in research. I took a citation from A.Einstein for the motto of my talk. And what could be a better way to start this conference than to look at one of the foundation stones of the Temple – A.Einstein’s manuscript on relativity which forms a solid basis for our knowledge.

The world is a complex place, where education, research, industry, society, environment, etc are linked locally and globally into complicated networks and patterns; it is through the proactivity of the single elements that new added values emerge. Research matters because it is “a vital part of the social tapestry of a modern state” as stated recently by LERU. Research not only contributes to innovation and to economic development, it is about man, society and the world, about culture and human perception, about inquiry into phenomena; it is a response to societal problems, to natural hazards and to climate change, a way of improving health and education and so on. Sometimes it is said that science makes a map of the world.

Indeed, our time is fascinating. New challenges in research – particle physics, molecular biology, brain research, climate research, energy research, complexity and many more are promising, and the results will give without any doubt new knowledge to mankind. Knowledge about man and nature, knowledge about society, knowledge to be used in practice. In this fast developing world, academies have an extremely

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\* Talk at the Jubilee Conference of the Israel Academy of Sciences, March 14-17, 2010, Jerusalem (reprinted with permission).

important role fostering top level research, furthering critical thinking in society and promoting independence and freedom of science. In what follows, the activities of academies are described based on recent achievements of the European academies and ALLEA – the Federation of European National Academies of Sciences and Humanities.

Some words about the very beginning. Viewed as the beginning of the Academies has been Plato's *Akademeia* in Ancient Greece, established in 387 BCE. It was a gymnasium (an upper secondary school) where young men were taught with the goal of educating philosophically thinking officials (sic!). It has been said about Plato's *Akademeia* that it was strongly connected with the political life of Athens. Curiously, by reference to the known materials *Akademeia* advised rulers and also the community in quite a few issues. Therefore the advisory role of the Academies is rather old, for that matter. Reportedly there were cases when *Akademeia* declined to discuss the problems. It is not known whether that gave rise to some sanctions. The existence of an independent and self-sufficient way of thinking is not always to the liking of the rulers, neither was it in the years long past, nor in the proximate past more familiar to us, nor is it in the present day, most deplorably. The *Akademeia* was closed in 529 CE by the order of the Roman Emperor Iustinianus. Although in Rome the school of *Akademeia* was a long time held in esteem, the Emperor is alleged to have said: "No one is allowed to teach the philosophy related to Athens and to interpret the positions coming from Athens". Hence the history of *Akademeia* abounds in phenomena which also occur in the present day.

The function of *Akademei*, related to teaching also found followers elsewhere. Like *Akademeia*, an Academy also came into being in Alexandria, under the protection of Ptolemy (Ptolemaeus) I Soter (367-283 BCE) and his son Ptolemy II. As a matter of fact, Ptolemy I established next to his palace the *Mouseion* (supposedly in 300 BCE) with a large lecture hall, living premises for the scientists and library. It gave birth to the famous Library of Alexandria, holding at the time of its splendour six to seven hundred thousand manuscripts in many languages. Ptolemy II was conspicuously known for inviting scholars to Alexandria. Their list is long including Euclid, Archimedes and many others. It is noteworthy that in terms of today's mobility, the incoming scholars were not taxed.

A similar Academy also appeared in Constantinople – under the aegis of Theodosius the Younger. The time, ca 5<sup>th</sup> C., was rather comp-

licated, which undoubtedly had an impact on the Academy's activity. Looking a bit forward, notice must be taken of Georgia and the 11-12<sup>th</sup> C. Under the leadership of King David II the Builder, an empire was established across the Caucasus region, uniting the tribes, and the King accorded much attention to knowledge and set up schools-academies, making use of the monasteries, which were well-established. Of greatest renown among them was probably the Gelati Academy, which used to be dubbed the second Athens (Metreveli 2006).

It took quite some time, before academies in the modern sense of the word evolved. It was as late as in the 15-16<sup>th</sup> C. that the immediate forebears of the academies *Academia Platonica* in Florence (1470) and *Academia Secretorum Naturae* in Naples (1560) came into being. It needs to be emphasised that at that time in Europe there were already famous universities in Bologna, Sorbonne, Oxford, Cambridge and elsewhere. The present day oldest working academies, however, sprang up in the 17<sup>th</sup> C.: in 1603 *Accademia dei Lincei* in Rome, in 1635 *Académie Française* (in the framework whereof in 1666 *Académie des Sciences*) in Paris, in 1652 *Deutsche Akademie der Naturforscher Leopoldina* (until 1687 *Academia Naturae Curiosorum*) in the free imperial city Schweinfurt (starting from 1878 in Halle), in 1660 the Royal Society in London (celebrating its 350<sup>th</sup> anniversary this year). The need for the Academies as promoters of scientific thinking and assemblies gathering knowledge into a mass was widely felt a century later and many present day Academies were created in the 18<sup>th</sup> C. A good overview about the history of the older Academies is available in the Proceedings of the conference held at the *Lincei* in 2002 (Le accademie... 2003). The conference was held to commemorate the four centuries long activity of Lincei.

Members of an Academy presented their research to the Academy either verbally in reports or in writing and those results were stored in columns of proceedings of the Academies. "Proceedings of the Royal Society of London", "Transactions of the Royal Society of London", "Comptes Rendus de l'Académie des Sciences de Paris", "Proceedings of the National Academy of Sciences of the United States of America" (PNAS) – those are publications of repute, which need no presentation, having been top journals through the ages and also the visiting cards of the respective Academy.

Much can be learned from the history of academies – their role in promoting knowledge, advising society, disseminating scientific ideas,

etc., but the world is changing fast. The aspirations of Europe agreed on about a decade ago in Lisbon and Barcelona to become the most competitive region of the world by creating the European Research Area are still widely discussed. The EC and its bodies have analysed the situation and issued several documents including the Green Paper 2007. The most recent ones are the ERAB Report “Preparing Europe for a New Renaissance” (2009) and the EC Report “Knowledge for Growth. Prospects for science, technology and innovation” (2009). The non-governmental organisations like EUA, LERU, ESF, et al. have all reacted with their visions and certainly the academies have not stayed aside. ALLEA has issued two statements on recent EU science policy (see below).

Nevertheless there are many problems we face today. Leaving aside the funding and the infrastructure, there are several deeper problems that are of concern for the academic community. And the reason of the concern is obvious: the responsibility of scientists. Some of those problems are:

- (i) starting from the ideas of ERA one must ask what should be a balance between competitiveness and cooperation? Should one follow the Darwinian principle on the natural selection of disciplines and research centres or should one find a suitable balance? The next question is obvious – who should decide about the balance? Actually there are many smaller problems starting from the individual level (careers), continuing on the institutional level (fights for funding and personnel) and coming to the governmental level (brain drain, for example). Once the ideas of ERA are based on competitiveness, then whether we like it or not, competitiveness is a part of our life.
- (ii) another circle of problems is related to performing research. There is increasing pressure towards project-based research and the attention paid to consistency and continuity of research is sometimes overshadowed by the need for ‘deliverables’. In Europe there is also much talk about the fragmentation of research but the advocates for moving to a homogeneous system usually forget that the changes towards lesser fragmentation need additional funding (cf. how Aalto University was launched in Finland).
- (iii) relations between science and society. This is a wide area where much must be done. An analogy of sign systems from semiotics

can be used here. By treating science and society as two quantities (this is just a simplified experiment of thought), it needs to be taken into account that the quantities overlap to a significant degree, however not entirely so. Science handles problems which are essential to society, but a part of science must be concerned with problems of which the society is unaware as yet. That is the unavoidable condition for creating new knowledge. If the quantities are fully coinciding, the constructive and propelling power of science would be lost and if the quantities were separate, the ivory tower effect would be generated. Both of those extremes lead to an impasse, before long. Hence the conclusion – science must see further than society and be able to give advice on new and existing knowledge. It needs transparency of research, science education and communication; surely trust between science and society is an important factor.

- (iv) last but not least, in the contemporary world the problems of knowledge-based actions are more acute than ever before. It is not simply following the ideas of Francis Bacon (knowledge is power), nowadays mankind faces nuclear power, stem cells, GMOs and GMFs, climate change, etc. and here the responsibility of scientists is of a decisive character to arrive at balanced solutions.

The activities of academies must be analysed against this general background. However, from the very beginning, academies have stated clearly their role in society. In the 17<sup>th</sup> C, Lincei said that their purpose was to discover the essence of things. What should be stressed is that Lincei was founded by young inquisitive minds! And in London, the Royal Society of London for Improving Natural Knowledge was founded. Two centuries later, the advisory role of academies was becoming more and more important. As mandated in its Act of Incorporation, the National Academy of Sciences in the USA has, since 1863, served to “investigate, examine, experiment, and report upon any subject of science or art” whenever called upon to do so by any department of the government. To sum up, the fundamental goals of academies, founded over last four centuries, are the following: advance top level scientific and scholarly research; further the critical scientific thinking in the society; promote science’s independence and freedom together with its responsibility.

The activities of contemporary academies reflect the diversity of the world. This is even more important in Europe where we witness diversity of cultures, diversity of languages, diversity of geographical differences and certainly also the diversity of ideas. And let us turn to the host of our conference. Although the Israel Academy is young compared to sister academies in Europe, the depth of history and culture, the wisdom of people in this country are all embedded in the pattern of science and knowledge. But we may point to every national academy and find a similar list of activities including science debate, science advice, science support, science promotion, sometimes also science production in those academies which run research institutes. How the accents are distributed, how the main activity lines are developed – all that depends on needs, traditions and societal links. As in all human activities, much more can be achieved if forces are joined. That is why ALLEA – the European Federation of National Academies of Sciences and Humanities, was launched in 1994. It is my pleasure to stress that the Israel Academy of Sciences and Humanities was one of the founding members of the Federation. The ALLEA mission is to facilitate exchange of information and experience between academies, to unite the voice of national academies in the service of society (advisory role), to address ethics, proper conduct and the responsibility of science and scientists. The main principles are independence, institutional membership and multi-science and multi-scholarship.

In 2010 ALLEA had 53 members – academies from 40 countries. I always like to stress that in some sense ALLEA represents an ‘ideal’ Europe compared to the EU. ALLEA assembles the academies in Europe that bring together the best researchers across all disciplines in all nations. The membership of ALLEA is diverse: from learned societies to research-performing organisations; from grant-givers to think-tanks; from leading G8 nations to emerging economies. This reflects also the diversity of Europe. Allow me to elaborate further on the activities of ALLEA.

The practical analytical work in ALLEA is carried out by Standing Committees and Working Groups. At present ALLEA has two Standing Committees: Intellectual Property Rights and Science and Ethics. The Working Groups analyse special questions and after their work is performed, they present their report to the Steering Committee or to the GA, and after the report is approved, the WGs will be dissolved. The recent WGs were, for example: Science Cooperation,

Science and the Media, Privacy in the Information Society. A new WG, namely the WG on Evaluation was launched in 2009. The reports of Standing Committees and WGs are published either in the ALLEA Yearbooks or in separate Report Series. The Yearbooks and Newsletters certainly cover all the events in ALLEA.

In short, ALLEA activities address the framework conditions that enable European research to perform at its best:

- exchange experience and develop best practice: changing regulatory and educational and publication cultures;
- address issues of (science) policy advice at European and trans-regional level;
- foster excellence in science and scholarship and high ethical standards in the conduct of science;
- support efforts ensuring the freedom of science and enhancing access to good science education;
- interact with policy makers, the media, and others for the benefit of science at large.

An important part of ALLEA activities is related to position papers and statements concerning European science policy. These documents are based on the opinions of the member academies which are collected and finalized by the Steering Committee and Presidency. Such position papers include reflections on the Framework Programmes and other EC activities. Two recent documents should be mentioned: “Challenges of the Future: Reflections of ALLEA on ERA” (2007); “Reflections of ALLEA on the EC Green Paper 2007” (2008). The first one was issued before the EC published the Green Paper 2007. It stressed that cooperation and complementarities were important issues and there should be a balance between exact sciences and technology on one side and humanities and social sciences on the other. The self-organization of research cooperation and clusters is important and regional cooperation should be supported. Certainly the barriers which still exist within the EU and on a larger scale should be removed for free movement of researchers and students. The second document of the EC Green Paper agreed on the instruments listed and explained in the Green Paper, but stressed the basics. This is really important: the ERA should be based on the understanding that research matters! It matters because it is a vital part of the social tapestry of a modern state and at this point ALLEA and the League of European Research Universities (LERU) have similar views on the importance of research

and know-ledge. And so ALLEA has stressed that such a position should be the basic one before the instruments are listed. ALLEA has also stressed that normatives in research must be avoided and that the EC should work as a catalyst. There are certainly many other points (for details see the document) but Academies have also an important role in ERA: they are strong advocates for excellence in research, they have an advisory role to society and to governments and they foster international cooperation. In this process of building up ERA, ALLEA is able to marshal the voices of its members and to speak with authority on behalf of the academic community. Recent joint efforts involve science evaluation, research integrity, science education and Young Academy/ies.

In all the scientific and scholarly studies, evaluation is an important tool for ensuring excellence and quality of research. This is so not only to understand the importance of research done but it gives an excellent platform for looking ahead. In 2009, ALLEA together with ESF evaluated the research institutions of the Bulgarian Academy of Sciences. This exercise can be in some sense compared to the exercises in the beginning of the 1990s when Danish, Norwegian and Swedish Academies of Sciences undertook the evaluation of research in the Baltic countries – Estonia, Latvia and Lithuania. As a result, this evaluation determined the potential of research in the Bulgarian Academy of Sciences and will contribute to the restructuring of the institutes if needed. In addition, ALLEA has launched a new Working Group on Evaluation with seven academies taking part in it. The WG will use the Bulgarian experience as background material to revise the ALLEA Self-Evaluation Protocol, possibly in order to modularise it. One important issue is to analyse the societal impact of the research evaluated. Additional tasks of the WG include reflections on the appropriate format of university evaluation and on specificities of evaluation of research output in social sciences and humanities. The WG will also connect Member Academies to other evaluation networks. There is a need to work out a comprehensive “European Evaluation Protocol”.

Science education is an issue for many academies in Europe and world-wide. Recently a constitutive meeting of the European Academies Network on Science Education was convened in Paris (June, 2009). The European network was born out of the need to find a partner for the IAP science education programme. It has been agreed that ALLEA, in close cooperation with the IAP, will coordinate the Euro-

pean Network aimed at identifying, developing and introducing novel approaches to science education across the continent. It is expected that participating academies would generate and join initiatives aimed at improving science education at the primary and secondary levels in their own country and cooperate with other academies and institutions in other European countries in raising the quality and efficiency of tertiary level science education. The ALLEA General Assembly Conference (Stockholm, 14-16.04. 2010) will have as its core theme “learning”. The theme will be pursued in several clusters: science education at primary and secondary school level; the changing regime at universities and life-long learning; the notion of learning (also in the sense of wisdom and scholarly knowledge) and the function of academies in a globalised world. I am extremely pleased that yesterday President Shimon Peres stressed the importance of science education and I could briefly explain the plans of academies in this respect.

ALLEA aims at strengthening the role of young scientists in the development of a vision for the European Research Area. An ALLEA study conducted in early 2009 showed that almost all Member Academies offer specific support to young scholars but very few offer a role in the science policy function of the academy. The same can be seen at the European level. However, the ice seems to start melting as some member Academies have established Young Academies (Germany, the Netherlands, and Austria) with others following them. Different in origin, in their relationship to the mother academy and in structure and remit, they almost all aim at enabling interdisciplinary research, establishing a network of future science leaders, encouraging members to enter science policy debates and to embrace responsibility for supporting early enthusiasm for science and scholarship.

ALLEA with its partners (ESF in particular) is now working towards a “European Young Academy” – EYA. The successful and diverse national Young Academies in Europe as well as other global young scholars’ venues (for example, WAYS; TWAS scholarship schemes, WEF young champions) provide very useful experiences to learn from. Nor should one forget the ERC starting grant awardees – a pool of excellent young scientists and scholars in Europe. ALLEA was invited to chair the programme committee that resulted in the participation of young scientists in the “Annual meeting of New Champions” in Tianjin, China (2008) where the World Economic Forum and IAP jointly supported the presence of some 50 young scientists selected

worldwide by academies. The 2008 initiative produced the Tianjin Statement of Global Young scientists “Passion for Science, Passion for a Better World”, which concluded: “Making a better world needs better science – we young scientists are ready to contribute our share“. In Europe, a brainstorming workshop “Towards a European Young Academy” was organised by ALLEA and ESF in Vienna (June, 2009). It brought together 20 early career researchers currently working in 11 European countries inside and beyond the EU, with research backgrounds in humanities, natural and social sciences and engineering. The statement of this workshop says: “Scholarly excellence and freedom across the full range of humanities and sciences depend upon enabling young scholars to actively participate in the shaping of the European research landscape of tomorrow“. It is quite clear that ERA 2020 and beyond will be shaped by the generation of these scientists and scholars who have stated their will in Tianjin and Vienna.

Academies and ALLEA have always stressed the importance of the responsibility of researchers and research integrity. In order to understand the present activities better, some past events should be listed. ALLEA has organized several conferences on general topics – like “European Science and Scientists between Freedom and Responsibility” (1997); “In Search of Common Values in the European Research Area” (2005); “The Ethical Commitment of Scientific and Scholarly Academies” (2005); etc., which all underlined the responsibility of scientists and, closer to the theme of this conference, the accountability of science. ALLEA together with the Royal Netherlands Academy of Arts and Sciences and other Dutch scientific organisations issued an important summary in 2003 – “The Memorandum on Scientific Integrity”. The Standing Committee of ALLEA recently convened a Symposium “Strengthening Scientific Integrity: Towards a European Code of Conduct? The role of the European National Academies” (Berne, 2009). At this symposium, several important issues were discussed: principles of scientific integrity, how to deal with allegations of misconduct, what could be recommended in rules and procedures, etc. The discussions showed that country case studies help to understand the current diversity of approaches and prepare the ground for joint actions – exactly in the spirit of ALLEA. With reference to preliminary discussions with UNESCO and OECD and within ESF, ALLEA has been working towards a European Code of Conduct on Scientific Integrity, reflecting on the necessary (minimal) institutional

and procedural requirements. So the work will continue, the follow-up meetings have been suggested and the results of this meeting will constitute the academies' input to the ESF process "Research Integrity" and will be presented at the 2<sup>nd</sup> World Conference on Scientific Integrity (Singapore, 2010).

Nowadays we speak more and more about the power of knowledge or soft power. But every power must be handled properly. In science this is directly related to research integrity and the responsibility of scientists. The principles of scientific integrity include not only objectivity, impartiality and independence of research but also honesty in reporting and communicating together with responsibility for future science generations. All the research organisations have a responsibility to promote a culture of research integrity. Looking back now at the activities of academies and ALLEA described above, it is obvious that research integrity is an important part of many lively actions and pursuits of academies. It is not only dealing with a Code of Conduct, it is related to science evaluation, science education, young academies, science-society relations, etc. The self-control of researchers and academics is strong and any misconduct if it happens is immediately discovered and condemned. After all, this is an integral part of public trust of science.

Competitiveness, which is a mantra for the EU policymakers, adds a lot of pressure on scientists, especially on early-career scientists. Indeed, the current career system means also the pressure to publish and the pressure to compete for funds. This means that early-career scientists need to learn to abide by high ethical standards and principles of research integrity. Actually research integrity is an ethical cornerstone of research and must be supported by all stakeholders in the scientific community: academies and universities, academic research organisations and industrial labs, and certainly by all governmental (UNESCO, OECD,...) and non-governmental (ALLEA, EUA, IAP, ICSU,...) organisations.

I did not elaborate much on science for policy but focused my attention on policy for science, as Prof Harvey Fineberg explained. In the EU, academies have launched the European Academies Science Advisory Council – EASAC and its activities will be explained by Prof Volker ter Meulen at the next Session. Science and diplomacy is another important field where academies may play an important role. The experience of the Royal Society described by Prof Lorna Casselton

is an excellent example of achievements along this line. ALLEA Standing Committee on Science and Ethics has called on academies to cooperate with Palestinian scientists, which could pave the road to wider contacts. Surely the relations between Israel and the Palestinian Authority are a delicate issue, but the Israeli-Palestinian Science Organisation may be one of the leading forces to enhance scientific cooperation.

Science is not only a body of knowledge, but also a way of thinking. ALLEA and its Member Academies take a challenge – to strengthen the academies as vibrant institutions which are able to touch the nerve of society either by leading the way to new knowledge or by bringing in knowledge to solve the acute problems of society. Let me finish with two quotations. George Bernhard Shaw said once: “Activity is the only road to knowledge”. And we know that actions must always be accompanied by responsible freedom as Thomas Mann said – “verantwortungsvolle Ungebundenheit”.

I would like to finish by thanking the Israel Academy of Sciences and Humanities for this extremely interesting conference. Thank you for your attention!

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## **European academies and research\*** **European Research on the Move, Wrocław, 4-5 September, 2009**

*Jüri Engelbrecht*

Academies are knowledge institutions with old traditions, which can be traced back to Plato in ancient Greece and were developed over the Renaissance period to contemporary academies. Lincei celebrated its 400<sup>th</sup> anniversary some years ago, Royal Society will celebrate its 350<sup>th</sup> anniversary in 2010, Bavarian Academy of Sciences had its 250<sup>th</sup> jubilee in 2009 – just to name some important dates.

The European Federation of National Academies of Sciences and Humanities, shortly ALLEA – All European Academies – was launched in 1994 as an independent non-profit organisation and in 2009 ALLEA has 53 members – academies from 40 countries. I always like to stress that in some sense ALLEA represents the ‘ideal’ Europe compared to the EU. ALLEA assembles the institutions in Europe that bring together the best researchers across all disciplines in all nations. The membership of ALLEA is diverse: from learned societies to research-performing organisations; from grant-givers to think-tanks; from leading G8 nations to emerging economies. This reflects also the diversity of Europe. From 2006 on, ALLEA has been legally incorporated under Dutch law; the Office is hosted and supported by the Royal Netherlands Academy of Arts and Sciences (KNAW) in Amsterdam.

The role of academies in the contemporary world is multifaceted. Academies are the strongholds of knowledge, they represent independence of thought, they generate new ideas, and they advise society on complicated issues of nature, technology and societal problems. Some academies are also research-performing organisations. The ALLEA mission is to facilitate the exchange of information and experience between academies, to unite the voice of national academies in service of society (advisory role), to address ethics, proper conduct and the responsibility of science and scientists. The main principles are independence, institutional membership and multi-science and multi-scholarship. The practical analytical work in ALLEA is carried out by

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\* Talk at the conference “European Research on the Move”, September 4-5, 2010, Wrocław. Published in “Science and Society”, 2010, 5, pp. 87-92 (reprinted with permission).

Standing Committees and Working Groups. At present ALLEA has two Standing Committees: Intellectual Property Rights and Science and Ethics. The Working Groups analyse special questions and after their work is performed, they present their report to the Steering Committee or to the GA, and after the report is approved, the WGs will be dissolved. The recent WGs were, for example: Science Cooperation, Science and the Media, Privacy in the Information Society. A new WG, namely the WG on Evaluation was launched in 2009. The reports of Standing Committees and WGs are published either in the ALLEA Yearbooks or in separate Report Series. The Yearbooks and Newsletters certainly cover all the events in ALLEA.

In short, ALLEA activities address the framework conditions that enable European research to perform at its best:

- exchange experiences and develop best practice: changing regulatory and educational and publication cultures;
- address issues of (science) policy advice at European and trans-regional level;
- foster excellence in science and scholarship and high ethical standards in the conduct of science;
- support efforts ensuring the freedom of science and enhancing access to good science education;
- interact with policy makers, the media, and others for the benefit of science at large.

In order to understand present activities better, some past events should be listed. ALLEA has organized several conferences on general topics – like “European Science and Scientists between Freedom and Responsibility” (1997); “In Search of Common Values in the European Research Area” (2005); “The Ethical Commitment of Scientific and Scholarly Academies” (2005); etc. A more targeted conference “Emerging Regional Cooperation: South-eastern European Academies of Science and Humanities in the ERA” (2007) shared the experience from many Academies from the North, West and Central Europe to Academies in the Southeast Europe which still face serious economic and structural challenges to solve. The materials of this conference are published in the ALLEA Report Series (2008).

An important part of ALLEA activities is related to position papers and statements concerning European science policy. These documents are based on opinions from the member academies which are collected and finalized by the Steering Committee and Presidency.

Such position papers include reflections on the Framework Programmes and other EC activities. Two recent documents should be mentioned: “Challenges of the Future: Reflections of ALLEA on ERA” (2007); “Reflections of ALLEA on the EC Green Paper 2007” (2008). The first one was issued before the EC published the Green Paper 2007. It stressed that cooperation and complementarities were important issues and there should be a balance between exact sciences and technology on one side and humanities and social sciences on the other. The self-organization of research cooperation and clusters is important and regional cooperation should be supported. Certainly the barriers which still exist within the EU and on a larger scale should be removed for free movement of researchers and students. The second document on the EC Green Paper agreed on the instruments listed and explained in the Green Paper, but stressed the basics. This is really important: the ERA should be based on the understanding that research matters! It matters because it is a vital part of the social tapestry of a modern state and on this point ALLEA and the League of European Research Universities (LERU) have similar views. Research not only contributes to innovation and to economic development, but is also about man, society and the world, about culture and human perception, about inquiry into phenomena; it is a response to societal problems, to natural hazards and to climate change, a way to improving health and education and so on. And so ALLEA has stressed that such a position should be the basic one before the instruments are listed. ALLEA has also stressed that normatives in research must be avoided and that the EC should work as a catalyst. There are certainly many other points (for details see the document) but Academies have also an important role in ERA: they are strong advocates for excellence in research, they have an advisory role to society and to governments and they foster international cooperation. In this process of building up ERA, ALLEA is able to marshal the voices of its members and to speak with authority on behalf of the academic community.

In order to make European research advance, a view ahead is needed from all the stakeholders. And here ALLEA has considerably activated its efforts based on wide consultation with the Member Academies. It is clear that joint efforts bring more added values – “the whole is more than the sum of the parts”, this is as Aristotle understood more that two millennia ago.

Below just some recent joint efforts are described which involve science evaluation, research integrity, science education and Young Academy/ies.

In all scientific and scholarly studies, evaluation is an important tool for ensuring excellence and quality of research. This not only to understand the importance of research done but gives an excellent platform for looking ahead. At present, ALLEA together with ESF is in the progress of evaluating the research institutions of the Bulgarian Academy of Sciences. An independent team of evaluators has been formed and the work should be finished in 2009. This exercise can be in some sense compared to the exercises in the beginning of the 1990s when the Danish, Norwegian and Swedish Academies of Sciences undertook the evaluation of research in Baltic countries – Estonia, Latvia and Lithuania. As a result, such an evaluation will determine the potential of research in Bulgarian Academy of Sciences and will contribute to the restructuring of the institutes if needed. In addition, ALLEA has launched a new Working Group on Evaluation with seven academies taking part in it. The WG will use the Bulgarian experience as background material to revise the ALLEA Self-Evaluation Protocol, possibly in order to modularise it. One important issue is to analyse the societal impact of the research evaluated. Additional tasks of the WG include reflections on the appropriate format of university evaluation and on specificities of evaluation of research output in social sciences and humanities. The WG will also connect Member Academies to other evaluation networks. There is a need to work out a comprehensive “European Evaluation Protocol”.

Academies and ALLEA have always stressed the importance of the responsibility of researchers and research integrity. The Standing Committee of ALLEA recently convened a Symposium “Strengthening Scientific Integrity: Towards a European Code of Conduct? The role of the European National Academies” (Berne, 2009). With reference to preliminary discussions with UNESCO and OECD and within ESF, ALLEA had been working towards a European Code of Conduct on Scientific Integrity, reflecting on the necessary (minimal) institutional and procedural requirements. At this symposium, several important issues were discussed: principles of scientific integrity, how to deal with allegations of misconduct, what could be recommended in rules and procedures, etc. The discussions showed that the country case-studies help to understand the current diversity of approaches and

prepare the ground for joint actions – exactly in the spirit of ALLEA. The work will continue, the follow-up meetings have been suggested and the results of this meeting will constitute the academies' input to the ESF process “Research Integrity” and will be presented at the 2<sup>nd</sup> World Conference on Scientific Integrity (Singapore, 2010).

Science education is an issue for many academies in Europe and world-wide. Recently a constitutive meeting of the European Academies Network on Science Education was convened in Paris (June, 2009). The European network was born out of the need to find a partner for the IAP science education programme. It has been agreed that ALLEA, in close cooperation with the IAP, will coordinate the European Network aimed at identifying, developing and introducing novel approaches to science education across the continent. It is expected that participating academies would generate and join initiatives aimed at improving science education at the primary and secondary levels in their own country and cooperate with other academies and institutions in other European countries in raising the quality and efficiency of tertiary level science education. The ALLEA General Assembly Conference (Stockholm, 14-16.04.2010) will have as its core theme ‘learning’. The theme will be pursued in several clusters: science education at primary and secondary school level; the changing regime at universities and life-long learning; the notion of learning (also in the sense of wisdom and scholarly knowledge) and the function of academies in a globalised world.

ALLEA aims at strengthening the role of young scientists in the development of a vision for the European Research Area. An ALLEA study conducted in early 2009 showed that almost all Member Academies offer specific support to young scholars but very few offer a role in the science policy function of the academy. The same can be seen at the European level. However, the ice seems to start melting as some member Academies have established Young Academies (Germany, the Netherlands, and Austria). Different in origin, in their relationship to the mother academy and in structure and remit, they almost all aim at enabling interdisciplinary research, establishing a network of future science leaders, encouraging members to enter science policy debates and to embrace responsibility for supporting early enthusiasm for science and scholarship.

ALLEA with its partners (ESF in particular) is now working towards a “European Young Academy” – EYA. The successful and di-

verse national Young Academies in Europe as well as other global young scholars' venues (for example, WAYS; TWAS scholarship schemes, WEF young champions) provide a very useful pool of experiences to learn from. One should also remember the ERC starting grant awardees – the pool of excellent young scientists and scholars in Europe. ALLEA was invited to chair the programme committee that resulted in the participation of young scientists in the “Annual meeting of New Champions” in Tianjin, China (2008), where the World Economic Forum and IAP jointly supported the presence of some 50 young scientists selected worldwide by academies. The 2008 initiative produced the Tianjin Statement of Global Young scientists “Passion for Science, Passion for a Better World”, which concluded: “Making a better world needs better science – we young scientists are ready to contribute our share”.

In Europe, a brainstorming workshop “Towards a European Young Academy” was organised by ALLEA and ESF in Vienna (June, 2009). It brought together 20 early career researchers currently working in 11 European countries inside and beyond the EU, with research backgrounds in humanities, natural and social sciences and engineering. They had been selected in a pan-European competition by ALLEA and ESF to come together and develop their ideas regarding the concept, usefulness, format and function of the future European Young Academy, to think about new forms of interdisciplinary collaboration, and to reflect on formats for intervention on science policy issues from a position of recognised authority and with independence. Common aspirations and ambitions that emerged were cast in a statement that will contribute to the project development. It is said in the statement: “Scholarly excellence and freedom across the full range of humanities and sciences depend upon enabling young scholars to actively participate in the shaping of the European research landscape of tomorrow“. It is quite clear that ERA 2020 and beyond will be shaped by the generation of these scientists and scholars who have stated their will in Tianjin and Vienna.

ALLEA will continue the discussions with institutional stakeholders and partners and hopes officially to launch the EYA project during the ALLEA General Assembly in the spring of 2010.

ALLEA and academies are not alone in the European Research Area. Together with partners in Europe (ESF, EASAC, *Academia Europaea*, etc), in other continents (NASAC), and worldwide

(IAP/IAC, ICSU, UNESCO), ALLEA aims to share experience and work together along common interests. A good example is the ESF and ALLEA cooperation in evaluation and research integrity issues. Two joint ESF/ALLEA workshops have established strong links in those and other prospective areas.

Above only a part of ALLEA activities is described. Much more is going on in Member Academies and in ALLEA as a whole. We know that science is not only a body of knowledge, but also a way of thinking. This is a challenge for us – to strengthen the academies as vibrant institutions which are able to touch the nerve of society either by leading the way to new knowledge or by bringing in knowledge to solve the acute problems of society. ALLEA's intention is to specify and enlarge all the activities where academies can join forces between themselves and other partners, where academies can complement one another, where the links to society and policy-makers can be strengthened by joint activities, etc. Sometimes it is said that the science – society interface needs lubrication; academies are excellent places for such continuous dialogues.

In preparing this overview, materials from the ALLEA Quarterly Newsletter Q2-2009 were used ([www.allea.org](http://www.allea.org)).

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## **Positioning the humanities and social sciences for a Europe in transition\***

*Nicholas Mann*

Traditionally, Academies brought scholars together to share and debate progress and perspectives for the further advancement of knowledge. This they did across all fields of scientific inquiry: in what we would now call the Humanities, Social Sciences and Natural Sciences, but what in earlier times may have been known as letters, moral and political sciences and the exact sciences. As the diversity of Academy structures evolved across Europe – a process that has been referred to elsewhere in this volume – in a number of countries the overarching title of ‘Academy of Sciences’ therefore came to include also the social and human sciences. In some countries, however, for instance in Spain, Sweden and the United Kingdom, distinct academies have been established to unite leading scholars in these fundamental areas of enquiry about the human past, present and future. The presence of these academies among the members of ALLEA is one of the hallmarks of the federation: ready access to the expertise of scholars in the Humanities and Social Sciences (hereafter: HSS) is of particular importance in the twenty-first century, when scientific policy advice is more and more in demand. HSS researchers and their Academies can ensure that the values and approaches that they represent are properly articulated in statements and recommendations that aspire to reflect the collective wisdom of scholars and scientists in all disciplines.

Nowhere is this collective wisdom more essential than in the arena of European science policy, with its current emphasis on knowledge and innovation. The Humanities and Social Sciences are, after all, the disciplines that address questions such as how innovation can come about, what can be done with it, how knowledge is created, structured, articulated, used and above all communicated. They are also the disciplines that enable us to understand ourselves and our society and to reflect on our place in the world – both in the sense of humans in the natural world and Europeans in the globalising world.

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\* Not published before.

A recent British Academy booklet, entitled “Past Present and Future: the Public Value of the Humanities and Social Sciences” (2010), offers the following definition: “The humanities explore what it is to be human: the words, ideas, narratives and the art and artefacts that help us make sense of our lives and the world we live in; how we have created it, and are created by it. The social sciences seek to explore, through observation and reflection, the processes that govern the behaviour of individuals and groups”<sup>1</sup>.

If we are to understand and address the issues that accompany the emergence of a new Europe, in particular demographic challenges (the aging of society; migration, etc.), diversity and inequality, and all sorts of cultural and institutional transitions, we need to encourage curiosity- and problem-driven research and cultivate the insights of the various sub-disciplines of the Humanities and Social Sciences.

ALLEA and its member academies observed – first with interest, then with concern – the development of the policy-driven priorities under the new Common Strategic Framework (the initial denomination for the new Framework Programme for Research and Innovation of the European Commission). These priorities were to focus on the Grand Challenges that society faces – some of which are mentioned above – and scientists expected that the advice of HSS researchers would be sought to design the future programme components. Yet, it seemed far from evident that the voice of the humanities and social sciences was to be heard in the design process; worse, there was a real danger that there would be no HSS-led component in the future programme at all.

ALLEA therefore particularly welcomed and supported the initiative of the British Academy in proposing a meeting to bring together representatives of a number of European academies to discuss the position of these disciplines in the current and future Framework Programmes. The meeting took place at the British School in Rome in early December 2010, and launched at the same time the work of the ALLEA Interest Group SSH.<sup>2</sup> Representatives of 16 academies from across the

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<sup>1</sup> Past Present and Future: the Public Value of the Humanities and Social Sciences, London 2010, p.2

<sup>2</sup> See for the work of the ALLEA Interest Group Social Sciences and Humanities: <http://www.allea.org/Pages/ALL/29/760.bGFuZz1FTkc.html>; see for the relevant documentation of the British Academy: The Social Sciences and Humanities in Framework Programme 8: enabling Europe to tackle its Grand Challenges: A meeting orga-

European Union and other European countries attended, covering a wide range of expertise across the HSS, and including experience in a variety of roles in relation to Framework Programme policy matters, application and assessment, as well as to national priority setting exercises.

### **The EC Framework Programme and the inclusion of HSS approaches from the whole of Europe**

The starting point for the discussions was the recognition that historically, in the transition from FP6 (2002-2006) to FP7 (2007-2013), progress had been made in the inclusion of HSS research in the agenda of the European Research Area. On the other hand participants admitted that not all opportunities had been fully exploited: notably the take-up of offers to engage in projects led by other sciences had always been less than satisfactory, as there had been a tendency for the HSS to consider themselves (and to be regarded) as merely providing ancillary services in such projects.

With this in mind, a number of issues were explored. The first is one not specific to the HSS but affects all disciplines, and relates to the unevenness of integration into the European Research Area of people pursuing research across different parts of Europe. Yet this would seem to be an important element of the mission of the Framework Programmes, given their ambition to promote the economic and social development and cohesion of the European Union, and to foster research that could guide such policies. Some argue, when considering the geographical spread of FP-awardees across all areas of research, that there is reason to be concerned at a continuing marked divergence between the numbers from EU15 and from EU12 countries, and likewise at the very low number of FP-supported projects that are coordinated by researchers from public research institutions in the EU12. If there is indeed, as it appears, a significant risk of perpetuating a two-speed ERA, the design of any future Framework Programmes – which will inevitably

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nised by the British Academy and ALLEA, British School of Rome, 2-3 December 2010. This paper draws substantially on the Declaration issued after that meeting, which can be found at [http://www.britac.ac.uk/intl/european\\_framework\\_programmes.cfm](http://www.britac.ac.uk/intl/european_framework_programmes.cfm)

speak of inclusiveness – must take specific measures to enhance the integration of scholars and scientists right across the ERA, and to develop and harness in particular the research potential in the EU12 countries, in so far as this is compatible with a continuing emphasis on excellence.

It should also be recognised that there are real financial obstacles in the way of applicants from the EU12: in particular, a lack of funding for the preparatory work, including the development of research networks, required for presenting convincing projects, and the problems faced by institutions in those countries in hosting successful projects. This could be to some degree offset by seed funding for less well-resourced countries, enabling them to support small-scale network-building meetings and to facilitate the development of contacts and experience.

Another observation that gave rise to concern is the imbalance of national representation among the designers for different European funding schemes, and in the panels and committees that assess applications. While it is understandable that large EU countries such as Germany, France and the UK are routinely represented on such panels, there is some evidence of a significant under-representation of many countries across Europe. Such imbalances may be of less relevance for the natural sciences, but can become crucial when the potential of research teams from EU12 countries in HSS fields are being assessed.

### **Interdisciplinarity, innovation and blue-sky research**

One challenge in earlier FPs had been the difficulty of establishing a genuinely interdisciplinary approach involving a meaningful consideration of the human, social and cultural aspects of the research undertaken. The signs now were that the future Common Strategic Framework was to redirect the emphasis of the “Cooperation” projects of the future FP towards meeting the so-called Grand Challenges (GCs) in order for the Vision “Europe 2020” vision to become reality. There was agreement that it was essential to ensure that the HSS were fully involved and appropriately funded. If for example the national governments and European institutions (Parliament, Commission) were to agree that climate change as a major GC should be addressed in a structured manner, appropriate attention would need to be paid to all its

impacts on society and culture, and to consider how these might be mitigated by suitable policy developments. What is true of “Cooperation” applies equally to the other three pillars of FP7 (Ideas, People, Infrastructure), which are equally crucial in developing research capacity and strength in Europe, and in enhancing Europe as a knowledge-driven economy.

The interim review of FP7 had in particular advocated the importance of excellence and of curiosity-driven or ‘blue sky’ research, and had suggested that these should not be limited to the ERC, but that ‘blue-sky’ components should also be opened up or strengthened under programmes for which there are politically predefined themes (‘Cooperation’) in order to stimulate the emergence of new points of view and, perhaps, unexpected questions and responses. The meeting was in agreement with this analysis and request: from the perspective of HSS, initiatives that bring together the foremost researchers in Europe around common questions, irrespective of their disciplinary, institutional or national affiliations, are highly desirable. The reintroduction of a research funding mechanism to promote collaboration in this way is the most likely means of laying the foundations for future innovative and ground-breaking research on a grand scale.

### **A Grand Challenge for SSH research: understanding Europe in transition**

It is gradually becoming accepted that effective policies for Europe’s future economic and social well-being and viability require an understanding of the deep changes taking place in European society and culture. As a consequence it should be possible to take advantage of the very notion of the Grand Challenges to secure the intellectual and analytical contributions of HSS research for the future of Europe. The Rome meeting took the view that there should be a challenge that would be especially designed to solicit input from these disciplines. It would draw primarily on the distinctive qualities of HSS research, and would by definition seek to involve scholars from all EU countries, as well as associate, neighbourhood and non-European countries. The proposed title for such a challenge might be “Understanding Europe in Transition”. Research would focus upon social and cultural change inside Europe, between its regions, and with a strong emphasis on the

relationships between Europe and other world regions. The Rome meeting identified three pillars for such a research programme.

Challenge “Understanding Europe in Transition” (sub-themes)

Memory, identity and cultural change

A central challenge facing Europe over the next decades is to create an environment in which European, national and ethnic identities can coexist and be mutually enriching. This requires an enhanced awareness of the historical context of current social and cultural changes, the critical role of language, communications and technologies, and an understanding of conflict, past policy failure and future policy needs as essential preconditions of more effective future policies.

Employment, education and working lives

With increased economic internationalisation and new technologies exploiting the potential of superfast broadband, the world of work is likely to be transformed in the coming decade. Policy-makers will need a close understanding of the rapidly changing structure of employment and work, and its implications for education, skills and training, and for people’s experiences of their working lives, including risks of precariousness, unemployment and social exclusion.

Inequality, families and the quality of life

As the constraints on ever-growing material prosperity become more severe, social progress is likely to be increasingly assessed in terms of the quality of people’s lives. Research needs to focus on the changing extent and distribution of inequality and its implications for personal well-being and the quality of life. Enhancing social mobility will become an ever more urgent issue if Europe is to make full use of its talent. This requires a deeper understanding of the determinants of the intergenerational transmission of inequality, in particular the role of changing family structures and the potential for policy to offset early disadvantage.

**Scope and scale of funding modes**

The question of appropriate funding was also discussed during the meeting. It was found that the funding models in previous FPs, with budgets easily reaching into the tens and hundreds of millions of Euros,

may well serve the hard sciences; they are not, however, necessarily well-suited to research in the HSS. Often, this latter still takes the form of projects operating on a smaller and more participative scale, with a clearly-focused research activity. Bearing in mind the arguments developed earlier, such smaller projects may also have a further advantage in view of European integration: they require relatively lower levels of administrative and infrastructural support and are thus more likely to be successfully led by smaller research institutions from EU12 countries, where the lack of such institutional support can act as a deterrent to engagement with larger projects. At the same time, smaller projects also provide greater opportunities for younger researchers to gain experience of project leadership, thus enhancing research capacity within the ERA. The specific paradigms of scientific production in the HSS need to be taken into account when determining the most appropriate funding model; it would seem clear that the two-tier model successfully applied in FP7 should be adopted for the future, allowing for budgets for both larger and smaller scale projects.

### **Research infrastructures**

There are, on the other hand, areas in which also HSS research requires very large scale funding – this is notably the case for research infrastructures. It is true that it is a fairly recent perception, not least among those pursuing research in the HSS, that the libraries, archives, repositories, museums and other collections upon which their disciplines have for centuries relied can be rightly assimilated to the category of research infrastructures. With the digital revolution now also touching research practices in the HSS disciplines, the growth and increasing use of datasets, databases, digitised resources and analytical tools bring together virtual research teams across Europe and indeed worldwide. The picture is changing dramatically: access to these resources, which makes the development of a new paradigm of e-science research in the HSS possible, will undoubtedly in turn transform the ability to undertake research and integrate resources and facilities across the European Research Area and beyond. If the tools essential for access to and analysis of the products of research (publications and the underlying data) are becoming increasingly sophisticated – many have been co-developed by researchers from across Europe through FP-

supported actions – development of and access to research infrastructures are powerful tools to break down the economic and institutional barriers that are still keeping European, and global, research communities apart. Furthermore, the potential use of structural funds for this purpose is not to be underestimated.

A good beginning has been made with the integrating activities for HSS research infrastructures, and in particular with the five specific ESFRI roadmap projects: CESSDA, CLARIN, DARIAH, ESS and SHARE, with total estimated construction costs of around 256 M€, to be generated with the help of seed money provided under FP7. Further support of this kind through the CSF should be encouraged, as should the comprehensive mapping of research expertise, for example through decentralised but compatible research information systems.

At the follow-up workshop in Brussels on 31 March 2011, when the Rome conclusions were discussed with the European Commission, speakers from the Directorate Research and Innovation emphasised that new RI projects are being approved. It is encouraging to recognise that after method-driven RIs of the first generation of ESFRI-roadmap projects (for example: social surveys; lexicography etc.), the new batch of projects will also be issue-driven (e.g.: archaeology and heritage issues; holocaust research)<sup>3</sup>

### **Indicators, visibility and evaluation**

Against the background of demands for a larger share of research funding for the HSS disciplines, we have in recent years witnessed increasing pressure on researchers pursuing work in the HSS to demonstrate the quality of their work and its impact in quantitative terms. It is well known that in the humanities and many areas of the social

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<sup>3</sup> See also for the current integrating activities: Enhancement and Access Improvement of the SHARE RI (SHARE-LEAP); Multinational Advancement of Research Infrastructures on Ageing (SHARE-M4); Cultural Heritage Advanced Research Infrastructures: a Multidisciplinary Approach to Conservation/ Restoration (CHARISMA); The European Social Survey – Data for a Changing Europe (ESS-DACE); Data without Boundaries (DwB); European Holocaust Research Infrastructure (EHRI). Details of all these can be found via the EC Research and Innovation Research Infrastructures website:

<http://ec.europa.eu/research/infrastructures>

sciences, the bibliometric assessment of research results still faces a major unresolved challenge in the shape of the many national languages used for top-quality research in Europe. Compared to the article-based publication culture in the natural sciences, the different publishing formats adopted by HSS also represent a formidable obstacle to traditional bibliometric methods. Existing dedicated bibliometric databases primarily capture articles published in journals in English and a mere handful of other languages. They do not cover scholarly monographs and collections of essays, which both frequently carry much of the most innovative and accomplished work in the fields of study covered by the HSS, and generic tools such as Google Scholar are but poor proxies. The whole issue of the application of bibliometrics to these disciplines will remain a deeply controversial one until and unless these very severe shortcomings are addressed. What is required, the meeting agreed, is the development of indicators which are more appropriate to the areas of study and modes of scientific output (formats and languages), and are above all based on quality, even when their aim might be to measure forms of impact. It is to be hoped that the future Framework Programme will make funding available both for this development and for a bibliographic quantum leap that will give better access to scientific production in HSS across all linguistic communities. The challenge therefore is not simply to capture articles and monographs in languages other than English, but to develop an infrastructure for recording research achievements that includes acknowledgment of the multiple ways in which HSS research impacts on public debate in just about all those areas of the grand challenges that have been discussed above, and that are of central concern for a Europe in transition.

### **Towards a European research information and infrastructure system for the humanities and social sciences**

Recognising that much has already been achieved in ESFRI, and taking into account the many medium- and small-scale national research infrastructures that need to be networked at a European level, the Rome meeting saw the need for a strategy which could eventually provide the HSS fields with a comprehensive European research information and infrastructure system. The development of such a system would need to

bridge at least three directorates (Research and Innovation; Information Society; Education and Culture), as it would have also to involve the multiple existing repositories of cultural and scientific treasures. Tentatively, the Rome meeting drew up the following list of necessary elements to be reflected in such a large-scale project:

- “Cataloguing of journals, monographs and other HSS publications: a searchable database of contents, with multilingual input and output.
- Ensuring standards and meta-data for digitised records and tools for analysing objects within texts, pictures, tones and multi-modal media.
- Open and, as far as possible, free access to published outputs and controlled access to primary data.
- Enduring support for the conservation of data and the migration of data to different platforms.
- Incentives for participation and maintaining comparability of information within longitudinal research.
- Incentives for national data collection to ensure high levels of country participation in ESS and similar databases.
- Mapping of research expertise across Europe and in other regions.”

### **People: Marie Curie Programme**

A key question for the development of the ERA, and of the next generations of European researchers in all disciplines, is that of mobility. Mobility of researchers (as of any class of professionals) is the best way to harness the diversity of European institutional and cultural traditions. There is an undeniable personal enrichment for future researchers arising from exposure to other learning and teaching methods, and to institutions that may organise research and higher education differently from the way it is done at home. This is particularly true for early career researchers, but should not be underestimated as a welcome challenge for senior researchers either. While it has been fostered by the Marie Curie Programmes among others, the material obstacles (particularly in terms of health care, social security and pension rights) are still considerable, and are real deterrents for transnational careers. If mobility is to be encouraged, to the benefit of the development of ex-

expertise, research capacity and strong research networks across countries and disciplines, than there is no doubt that funding for the Marie Curie Programmes should be enhanced in the coming FP.

In relation to the EU15/EU12 imbalance referred to earlier, the interim evaluation of FP7 foresaw the need to use the “People” programme as a means to invest in strengthening the participation of EU12 researchers in the ERA. But as it is currently articulated, the programme also exposes the EU12 countries to a not insignificant degree of risk arising from the danger of brain-drain. For the future, it would be important to develop mechanisms to offset this danger, for example by allowing awards distributed by institutions hosting Marie Curie Fellows to be used proactively, and by strengthening the returnee component of the scheme, which could be redesigned and expanded so as better to support such national schemes as exist to achieve the same effect.

The Rome meeting endorsed these views, but also emphasised practical issues that would make new measures effective. In particular it agreed that in order to broaden the range of applicants, and to encourage those who would for personal or professional reasons otherwise find it difficult to embark upon a one- or two-year Fellowship, there should in the future be greater flexibility over both the duration and the timing of the research visits. Participants at the meeting were also concerned about the need to open up industry-academia lateral mobility schemes for institutions outside the manufacturing sector that would typically absorb scientifically trained staff from HSS disciplines (NGOs; cultural service providers; etc.), and explicitly to include the public sector too in such schemes. They argued that in a similar way, CO-FUND proposals should also explicitly include openings for HSS research.

### **Ideas: European Research Council**

The most significant addition that FP7 has made to the building of the European Research Area is probably the European Research Council. The ERC has also added a substantial new dimension to support for HSS research, and one that has truly changed the funding landscape for European science and scholarship, pressing as it has for the establishment of pan-European criteria of excellence. We have witnessed the be-

ginnings of an explicit, Europe-wide understanding of how to proceed with the assessment of excellence of promise and achievement across linguistic and disciplinary boundaries. Operating in responsive mode and therefore supporting curiosity-driven research, including projects with an interdisciplinary and transnational focus, the ERC has understandably already found great favour with the HSS research community. The Academies hope that it will be allocated a significantly increased budget in the new FP.

The meetings in Rome and Brussels rejected a position that would see HSS research ‘covered’ by ERC funding. An expansion of the ERC must not be seen as replacing the opportunities for the HSS to contribute to solving the challenges to be included under the future FP’s ‘Cooperation’ pillar – whether those challenges that can only be dealt with through HSS research, or those where other sciences need support from HSS research.

The meetings did not discuss the new measure of support for the exploration, for discoveries made in the course of ERC projects, of entry points to product development and market creation (‘proof of concept’). It might however be argued that the community should make proposals on how similar support schemes can be created for HSS research results that are capable, *mutatis mutandis*, of providing significant insights and even of changing practices.

### **Towards a European alliance in defence of HSS for “Horizon 2020”**

The conclusions of the Rome meeting referred to above were enshrined in a statement that was intended as a first input from the research community represented by Europe’s national academies to the process of the development of the Framework Programme. The Academies represented at the meeting, as well as numerous others that could not attend the Rome meeting for scheduling or meteorological reasons, subscribed to the positions taken. The statement was submitted to the European Commission and triggered a coordination of actions between a number of European level actors in defence of HSS in the new Framework Programme, or “Horizon 2020” as it has come to be called. This coordination occurred through a series of strategy meetings (Bonn, Brussels and Athens) and the agreement on a number of programmatic

texts between academies (ALLEA), research councils (ESF Standing Committees SCH and SCSS), university-based Humanities research institutes (ECHIC) and the network of government-appointed and ministerial contact points and coordinators for Social Sciences and Humanities in the Framework Programme (Net4Society).

Having reached this stage, ALLEA convened with very generous support from the British Academy's international programmes a day-long meeting (referred to briefly above) for the Interest Group SSH at the Royal Academies in Brussels on 31 March 2011<sup>4</sup>, at which some 25 Academies and representatives of these various parties exchanged views with several senior representatives of the Directorate Research and Innovation, who attended together with a sizeable number of their staff members. The clear message – that the largest researcher community in Europe would not accept being marginalised in the process of building the European Research Area – was well-received.

The positions of the academies on the future of Humanities and Social Sciences in the future Framework Programme – as articulated and communicated through the ALLEA Interest Group and further developed in exchanges with the other relevant organisations – were subsequently chosen as the launch presentation for the stakeholder workshop on the Common Strategic Framework for Research and Innovation convened under the title “Towards more inclusive, innovative and secure societies” by the DGs Research and Innovation, Information Society and Media and Enterprise and Industry<sup>5</sup>, and were also presented to the workshop that these DGs held with member states and associated states.

The British Academy is the lead academy of the ALLEA Interest Group Social Sciences and Humanities, which will be pursuing the future of HSS in Europe after FP7. To this effect it would certainly be desirable for London to host, as requested by Brussels, a half-day meeting with the Commissioner for Research and Innovation that would allow for a frank exchange on the role of the Humanities and Social Sciences as Europe's societies prepare to invest in tackling the grand challenges they are facing.

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<sup>4</sup> Humanities and Social Sciences in Europe: Beyond the EU Framework Programme 7.

<sup>5</sup> Brussels, 27 June 2011.

**ALLEA General Assembly Business Meeting**  
**April 13, 2011, Amsterdam\***  
**Opening Address**

*Jüri Engelbrecht*

Dear colleagues, Ladies and Gentlemen!

It is an honour and privilege for me to welcome all of you here to the Tinbergen Hall of the Royal Netherlands Academy of Arts and Sciences and to the ALLEA General Assembly Business Meeting. We have extremely important questions on our Agenda which need the utmost attention from all of us. At this moment we have representatives of 38 academies attending the Business Meeting.

Allow me some introductory words about academies, ALLEA, and Europe.

**Academies** are strongholds of knowledge in the most general sense of the word. They unite top scientists, they are strong advocates of excellence in research, they issue statements on the basis of scientific evidence, advise governments and society and so on. Many academies are also research performing organisations with world-class research institutes. One might add that academies are also cultural institutions because all their activities including direct research are a part of human culture. The mission of every National Academy is to serve its country, and its actions are very much shaped by the traditions, history, educational system, economic situation, and perhaps most of all by science-society relations in the country. The latter means how knowledge is valued by society. The main assets of academies are: independence, excellence and authority.

**ALLEA** unites the academies of Europe in assisting its members by offering a platform to discuss and coordinate their multilateral science and science policy engagements, by promoting the exchange of experience; as the independent voice of science in Europe, ALLEA proposes analysis and advice on many issues of science policy at the European and world level.

**Europe** as a whole is developing fast. Much is going on in science and society: globalisation and Grand Challenges, new technological

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\* Not published before.

ideas and new social problems. We speak about the Innovation Union and the Common Strategic Framework, about Joint Programming Initiatives and FET Flagship Programmes, about Europe 2020 and the recent EC Green Paper. The stakeholders in science policy, such as EUA and LERU, Euroforum and JRC, are intensifying their efforts; the ESF and EuroHORCs want to merge in order to unite the voice of Research Councils.

It is quite clear that academies cannot stand aside when the joint voice of academies is needed and requested by the EC and our partners. As every organisation, we must constantly ask ourselves whether we are doing our best to follow the aims of academies and to justify the hopes of society. As George Bernard Shaw said: “Activity is the only road to knowledge!” In preparing this GA meeting, I checked the minutes of our past meetings, our publications and Newsletters. If we take the last three years, you will be convinced that ALLEA has been doing very well. The activities of academies are visible, joint meetings have resulted in many new ideas, ALLEA is participating in many EC activities and so on – the Newsletters document it all. I need scarcely remind you that for last three years our meetings have been properly prepared with cover sheets and additional materials at a high professional level, for we now have a strong and dedicated Secretariat with an Executive Director who is a proficient expert in science policy.

But no one ever said that life was easy. At the present time we face difficult problems – to agree on the budget and the strategy or the other way around – on the strategy and the budget. As you all know, until now we have had a generous subvention from the Dutch government and through the Royal Dutch Academy. From 2012 on we will have to live without that. I would like to thank our Dutch colleagues very much for this support, which has made it possible to develop ALLEA into a modern and vital institution. But it is quite clear that all our Member Academies must lend a hand to our joint work. This was first discussed at the GA meeting in 2008, and the relevant information was disseminated. In parallel, the ALLEA Strategic Plan was drafted on the basis of the Academies’ proposals. Here too we face difficulties because not all the member Academies welcomed this Plan. I will not go into the details, since the discussions are reflected in our documents. But I would like to stress the following. Compared with other similar organisations (such as ESF, LERU, etc.), our staff is very small – only two persons paid out of the budget. Next, while many other organisa-

tions – IAP for instance – are funded by a single source – to my knowledge ALLEA is the only one that, in the face of the present financial constraints, is moving from a single source of funding to shared support by its members.

We have had several discussions – at general meetings in Amsterdam 2009 and in Stockholm 2010, at a recent brain-storming meeting in London 2011, not to mention direct consultations. The fact is that the situation is alarming, and that is why we must all find an answer here to the question: what kind of ALLEA do we want? The facts clearly show the discrepancy between the present level of activities and the possibility of supporting them.

Ladies and Gentlemen, with this short introduction I would like to open the ALLEA General Assembly Business meeting.

**ALLEA General Assembly Business Meeting**  
**April 13, 2011, Amsterdam\***  
**Closing Address**

*Jüri Engelbrecht*

Ladies and Gentlemen!

I very strongly believe in the potential of academies. There is no doubt that they have an enormous potential to analyse the complexity and predictability/unpredictability of the world, a potential to understand the hidden mechanisms of nature and society, a potential to create new knowledge, and last but not least – academies also have the courage (and responsibility) to inform society about unpleasant things. ALLEA's remit is to specify and enlarge all the activities where academies can join forces between themselves and with other partners, where academies can complement each other, where the links to society and to policy-makers can be strengthened by joint activities, etc. National experience may feed the international community, international activities enhance the national community.

A hidden question behind our discussions has been: were we moving too fast? I would like to remind you of what the Red Queen said to Alice in Wonderland: "It takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

For an organisation to be active, it must have active members. Academies are certainly active, and it is our responsibility to give added value to those activities. We should be looking for more opportunities, not for threats: mistrust and misunderstanding are serious stumbling blocks. The Presidency and the Secretariat have done their best to draft the Strategic Plan(s) and to build up a consistent budget, but they have failed. This means that their vision of an ambitious inter-academy organisation in Europe does not currently appear viable. That is the reason why on April 4, 2011, I and the Vice-President Prof Nicholas Mann sent a letter to all the member academies announcing that we propose that a new Presidency be elected this year.

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\* Not published before.

This new Presidency will then be able to consider new steps aimed at restructuring the whole organisation. In the meantime, the outgoing Presidency will of course honour its responsibility to prepare the way for the new one.

Whatever the reasons, I personally cannot accept that ALLEA must restrict its activities; my strong feeling is that it should even expand them. It is not only because we need to react to all the changes around us and to the proposals of the EC; it is also because we need to disseminate academic values. It is the responsibility of all scientists and scholars to foster research and disseminate knowledge in today's very pragmatic world, to support values, to oppose the ambitions of profit-makers and bureaucracy, and to decrease the perplexity of our complex society. I know that it all sounds very idealistic, but one of the questions at the turn of the millennium was how humanity would cope with what we now call Grand Challenges. To do so, we need knowledge, and who is better equipped to lead the way in this respect than academies? From those academies, ALLEA derives its main assets: excellence, independence and authority.

The future starts today. The road forward may not be smooth, but we all are convinced that this is right and proper to pursue it. *Vivat, crescat, floreat ALLEA!*

At this point, we would like to thank all the academies for their support.



**Part III**  
**Research papers**



## Posterity replies to Petrarch\*

*Nicholas Mann*

“Only ghosts wrestle with the dead”.  
(Petrarch, quoting Pliny, quoting Plancus)

You will not be altogether surprised to learn that you were right when you said in the letter to Posterity that you drafted in the 1350s and then retouched towards the end of your life: ‘Perhaps you will have heard something of me, though it is doubtful whether my obscure little name will have been able to come down to you across space and time. And perhaps you will want to know what kind of a man I was, and what has become of my works, especially those of which you have heard tell, however vaguely’. Despite the naked rhetoric of your modesty, you took care to ensure that we would indeed hear of you, and read your works, and be curious to learn more of you and of them. Your letter thus deserves an answer.

We have had time to discover, and to appreciate, what you wrote. It has not always been easy: when they are no longer there to defend themselves, men are frequently misunderstood; their deeds forgotten or travestied, their words carried away, as you and others have said, by the wind. You were fortunate not to live in our self-obsessed age, where the most trivial of our transactions are relentlessly recorded in our autobiographies, our reality TV shows and our blogs, for the benefit or otherwise of ourselves and the audience that you most despised: the general public. No doubt some Herculean electronic current will sweep all our preposterous Augean stables clean one day and relieve our posterity of any obligation to attend to them, but in the matter of self-promotion you were both skilled and discriminating: you could choose what you wanted to leave, and you did so, very carefully. Yet what you could not control was who read it and how. You admired Socrates, who

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\* This paper, written in English, was originally published in Dutch under the title “Het nageslacht antwoordt Petrarca” in *Europees humanisme in fragmenten. Grammatica van een ongesproken taal*, ed. R. Riemen (= *Nexus*, 50), Amsterdam, 2008, 518-528; the author is grateful to Mr Riemen and the publishers for permission to publish it in English. A French translation also exists: “Lettre de la postérité à Pétrarque”, *Conférence*, 2009, 28, 193-208.

called himself a citizen of the world. And that is what you have become: your name and your image and even your works have travelled far further than ever you managed to do, and are resident in countries that were unheard of in your day, where cultures that you knew nothing of have adopted or appropriated you in their own image and likeness. Each of them has reinvented you according to its own lights, usually on the basis of what you left behind. The irony is that two of your most consistent traits – moulding and shaping your own image as you went along, and yet constantly stopping short of definition and conclusion – have left us with the liberty to reinterpret you at will, in ways that you would not necessarily have appreciated.

We need to get your love out of the way first. In your letter you pass briefly over it, saying that it was passionate and unfulfilled, and that you laboured under it in your youth. And while we cannot, however hard we try, reconstitute the realities of those labours, we can read the poems that they produced. You sometimes referred to these as mere trifles. That was surely disingenuous: if you did not want us to be drawn into their net, you should have destroyed the evidence of the huge effort that over many years you put into perfecting those 366 poems and the story that they tell: this was no trifling endeavour. But you would probably be dismayed to learn that for succeeding generations they came to stand metonymously for you, and that your love-life, or lack of it, and your Laura real or imagined, were the almost exclusive concern of several centuries of romantic imagining and memorialising in books, images, busts and even statues. There must be some lessons for us all here: how can a part of posterity have been so thoughtless as to privilege this passion, which you portrayed as flawed and sinful, over the far greater one that lay behind the vast majority of what you wrote? For if you had a grand design, it was surely not to go down in history as another lover, particularly not an unsuccessful one.

Our twentieth- and twenty-first-century perspective is different: better informed perhaps, though not for that reason necessarily exempt from error; more aware of the strategies of authors and thus more critically inclined towards your statements about yourself; and more concerned to compose a picture of you that encompasses the whole range of your activities and achievements, not just your amorous pursuit. Above all, that means taking into account what for us is now a dead language, but was for you more of a living mother-tongue than the exquisitely literary vernacular in which you composed your love-songs.

What you wrote in Latin is both immensely more abundant and usually more directly informative, however much it too was subject to your linguistic and rhetorical designs, and your persistent editorial scrutiny. As we read your letters, your historical and moral treatises, your passionate public invectives, and even your private wrestlings with the books that you were reading and with your own conscience, we believe that we encounter the man behind the poetic lover, endowed with a quite different range of passions and something approaching a grand design.

Latterly we have come to call that design, or the urge to realise it, humanism, but the abstraction would have meant nothing to you. When we speak of you as one of the fathers of humanism, we conflate two elements which succeeded each other over the centuries separating us from you: the active study of antiquity, and a belief in the dignity and self-sufficiency of man. Over time, the former has ceased to nourish the latter, which has acquired a life of its own. Our secular world has largely lost sight of the divine purpose which for you was the ultimate reality; our supposedly democratic and increasingly populist world has no sympathy with the educational hierarchies and linguistic elites of the past. And many of our classical scholars have lost sight of any goal other than the self-seeking and ultimately self-destructive one of preserving their discipline unchanged in a rapidly changing world.

You were a classical scholar, the finest of your day, but you believed in the potential of your studies (not yet organised into anything so constrained as a discipline) to change the world. And that was probably your major passion, driving the grand design of restoring a glorious past that had never quite existed as you thought. We will return to this. You were also (and perhaps foremost) a believing Christian, for whom the pagan literature of Antiquity was not wholly unproblematic, and while the dignity of man was certainly one of your favoured themes, so too was the insignificance of man and the misery of his condition in the wider scheme of God's creation. The medieval world lives on in your writings alongside the classical past and the promise of a new era.

You did not see yourself as the founder of anything new, but rather as the inheritor of a tradition (and a very old one), with the duty to further it and to pass it on, and as an investigator in search of truth. In one sense, Antiquity had always been there: you and your contemporaries lived surrounded by the remains of ancient Rome. But not many bothered, as far as we can tell, either to explore them or to seek to

understand them so as to bring them into the present. In that age before archaeology you were a true innovator. You frequently marshalled monuments and artefacts in the service of what we would describe as a primarily philological method: the search for and comparison of ancient writings, known and unknown. You subjected whatever came to your attention to meticulous scholarly scrutiny, with a view to establishing and understanding a correct text, restoring or improving it where necessary. We owe you a real debt for some pioneering work of this kind, in particular in relation to Livy's "Roman History". In a letter written long after the event, you declared that Cicero and Vergil were your companions – a father and a brother, you said – from childhood; you came to know both intimately and to absorb their lessons, their language and their style. But there were many others, notably Livy and Horace, who came to influence you deeply, and in your later years you even attempted to read Homer in Greek. You were one of the first to move back towards classical Latin expression, paradoxically a movement of progress, to be refined and completed by the generations that succeeded you. And all this without for one moment abandoning the study of Christian literature, and above all that most classical of the Church Fathers, Augustine.

But scholarship alone is hardly likely to endear anyone to posterity, and we need to set it in a broader context. You frequently (especially in your later writings) express your dislike of the world in which you lived, and allege that it was a cause of your study of Antiquity, though to us with hindsight it seems more likely to have been an effect; on one occasion you go so far as to say that you stand at the border between two peoples, looking both forwards and backwards. Whether or not the qualified optimism with which you seemed to view the future was justified – and one could be forgiven for thinking that you would dislike our century even more than your own – the effect of escape into the past was to conjure up a vision of an idealised age which you were uniquely well qualified to explore and acclaim. Your grand design was to restore it, but that design was flawed.

First, there were limitations in your understanding of Roman history which seem obvious enough to us, but for which you cannot be held responsible. Despite your remarkable command of the historical texts available to you, and your ability to use evidence derived from them for practical as well as scholarly purposes, there was much that you did not know, and could not have known. Your enthusiastic (and of

course partly Vergilian) vision of a golden age, a myth which was to become a commonplace of subsequent humanist historiography, laces literary history with a fair dose of high-minded fiction.

Second, the practicalities of restoration fell far short of ‘Realpolitik’. To revive the Roman Republic, however imperfectly understood, in the context of a fragmented version of the Holy Roman Empire was misconceived, as your support for the failed revolution of Cola di Rienzo was unfortunately to reveal. A popular uprising against the baronial rulers of Rome, led by another admirer of antiquity whose grasp of history was less sure than yours, and distorted by eschatological visions, might have seemed to you the ideal opportunity to reinstate the glories of the past. But the burden of a thousand years or more of other history, including the Papacy, could not so lightly be set aside, and in the end you had to admit that your dream was indeed a dream. Even so, we admire you for the tenacity of your vision and for working assiduously until the end of your life on a politically far more realistic aim: to persuade the Pope to return from Avignon to Rome, and thus to restore at least one element of the grandeur of the Eternal City. On this particular point, subsequent history has proved you right.

Apart from what we might describe as your historical research, exemplified not only by your study of Livy, by your collections of lives of great men and of memorable deeds from antiquity, but also by the countless marginal notes you left in your copies of the classical texts that you read, there is another and perhaps more fundamental aspect of your engagement with those texts: the way in which your scholarly reading translated itself into creative writing. These days, literary imitation is sometimes difficult to separate from plagiarism, which in turn is considered theft of intellectual property. Courts of Law are asked to adjudicate whether a writer is using another writer’s words in such a creative way as to justify the appropriation; university students are penalised for failing to acknowledge their sources. Things could not have been more different in your day: part of the very substance of the tradition that you admired and handed down to us was the transcription and redeployment of the texts of antiquity. The more that you could write like Vergil or Cicero, the better your writings would become.

This could be achieved in one of two ways. Broadly, by adopting classical models for your own works – and we note that the majority of your writings were shaped in imitation of Roman ones, and in particular that you were one of the originators, with your *Bucolicum carmen*

and your *Africa*, of a lasting fashion across Europe for bucolic and epic poems in the Vergilian manner. Then more narrowly, in incorporating into those works the words and the style of those whom you were imitating. Many generations of scholars have occupied themselves with sniffing out the classical truffles buried in your prose and verse, both in Latin and Italian; the result is a rich compost of borrowing which bears tribute as much to the diligence of the scholars' efforts as to the breadth of your reading. But the footnotes of posterity (and indeed some of your own letters) reveal something more: that you were actively concerned, in a way which is unexpected in the context of the tradition, but which is nonetheless part of it since it derives from a Senecan example, with the quality of imitation and the need to avoid servile dependence on your models. You were not content to use another man's words, but strove to ensure that you made them your own. In so doing, and in writing to tell your friends, and now us, how you undertook this and how important you considered it, you set an example that we may still follow. And your own writings have become an essential part of the tradition that we associate with humanism, transmitting to later ages the values and cadences of a distant past.

Some of these values are medieval rather than classical, though paradoxically the nearer they are to us in time, the more they may distance us from you. That is the case of religion: life without God was inconceivable in your day except as heresy. You had no choice and no specifically religious dilemmas: your Christian faith was fundamental to your thinking and to your perception of yourself; it guided you through life and prepared you for death. It was also the source of copious reading, much of which is reflected in what you wrote, especially in two treatises which touch explicitly on matters of practice: on the Solitary Life and on the Repose of the Religious. From the Church Fathers, and from Pliny among other classical sources, you knew something of the rites and practices of other distant times and lands, but simply considered them erroneous. You would not understand our desire to accommodate other faiths: you believed that the best of your Roman heroes would simply have been Christians if they had had the chance, and that even Hermes Trismegistos anticipated certain Christian beliefs. On the other hand, your knowledge of the Scriptures was enriched by your constant interrogation of Augustine, Jerome and others: not blind belief but an enquiry into the nature and meaning of your own faith and its significance as an inescapable element of your iden-

tity. Even if we do not identify with that enquiry, it stands as a model of profoundly intelligent religious observance.

We can come closer to sharing with you some of the earlier values. Our age is still indebted to Classical thought, and implicitly to you for having played a role in transmitting it to us. But the nature of that role is not entirely straightforward. You distance yourself very clearly from the arid concerns of the professional philosophers of your day, and in particular from those of the scholastics and disciples of Aristotle; you were at most, in your own words (quickly taken up by your immediate successors) a moral philosopher, more concerned with the practical issues of daily life than with the niceties of logic and distinctions, or indeed with ideas in the proper sense. In this you are more clearly aligned with Seneca and Cicero and that great intermediary Augustine than with what little you knew of Plato. It is however a measure of your real interest in the application of philosophy that you devoted over a decade of your mature years to the compilation and composition of an encyclopaedic guide to right-thinking, the *Remedies for Fortune*.

You made this into a vast repository for your classical knowledge, in the form both of information drawn from ancient history, and of quotations from the Roman writers who most influenced you. But the repository is not a random one, for this enigmatic work, which was a European best-seller, and far more widely known than your love-lyrics in the century after your death, is also what comes closest in your writings to being a systematic meditation upon ethical issues. It is systematic enough in its rhetorical structure to be used as a manual, which no doubt goes some way towards explaining its popularity; it defies a global reading in search of any clearly articulated philosophical purpose. In two books, divided between, and balancing, the attributes of prosperity and adversity, you provide us with over two hundred and fifty topics, most usually drawn from aspects of the everyday such as wealth, public recognition, book-collecting and pride in children on the one hand, loss of friends, ugliness of wives, toothache, exile and fear of death on the other. Each of these is debated between Reason and protagonists representing the passions, borrowed from Cicero's *Tusculan Disputations*: Joy and Hope in the first book, Sorrow and Fear in the second. The passions are on the whole characterised by a lack of argumentative skills: they simply repeat their delights or their regrets, their hopes or their fears, in a series of scarcely modulated assertions.

Reason has all the best lines, and a formidable battery of examples in support of her point of view.

What did you intend by this? If we read a single dialogue in search of practical guidance for particular circumstances, we quickly sense the stoical nature of your, or Reason's, solutions; a more sustained reading confirms our first impression: right thinking, by out-arguing and even abolishing the passions, provides a rule for life. Stoicism is not much in fashion these days, and your version is in any case not a purely classical one, being strongly modulated by St Augustine, and by your desire – with which we are no longer concerned – to square a pagan ethic with a Christian one. But you have nonetheless handed down to us a significant amount of practical antique wisdom in this compendium, and in a sense our gratitude is the greater because you have done so without the rigour of the philosopher or the dull insistence of the teacher. That you were at heart a poet can be seen from your paean to universal change and the fragility of all things in the preface to the second book. And that too is rooted in the tradition or traditions that you embody.

Earlier, we set poetry aside so as to respect your own hierarchy of your activities, but as we continue to probe “what kind of a man you were and what has become of your works”, we must return to it as an area of creative activity in which you excelled, and for which you remain rightly famous. We need to distinguish, though not entirely to separate, your Latin from your vernacular writings. While they are different in their means of expression, and to a large degree in their subject matter, they are united by your concern with language and by the constant presence, under the surface, of echoes of the ancient world. Vergil and Horace, for instance, are as active in your Italian lyrics as in your Latin verse epistles; the perpetual perfectibility (the phrase is Gianfranco Contini's) of your vernacular verse is sought by the same process of filing and polishing (as Horace has it) that we encounter in the emerging versions of your Eclogues. The search for the definitive form of works constructed of many separate elements composed at different points in time is characteristic of your strategic approach to your writing. If for no other reason, we must stand in awe of the integrity of your authorial efforts, and of the vital and vibrant nature of your language.

These are very much modern concerns, though whether they will survive into the post-modern age remains to be seen. Earlier centuries

were more impressed by your poetic themes and structures. Not just, that is, by the love of the *Canzoniere*, initially only favoured in Italy, but by the very way in which it creates an extended story from a sequence of sonnets and other relatively short lyric forms: a narrative structured by a symbolic chronology and sensed as much as it is told. Not just the historical and mythological pageantry and moral message of the *Triumphs*, which were to sweep Europe about a century after your death, but their potential for endless elegiac and iconographic extension. As we suggested earlier, the very idea of an epic Latin poem – even if yours was never finished – excited admiration and the wish to emulate; your Eclogues helped to shape those of your friend and disciple Boccaccio, and stand at the beginning of a whole new tradition of bucolic verse; your Latin verse Epistles, like all your correspondence, set the tone for generations of humanist letter-collections.

However much that correspondence was edited by you to make it conform to the ideal chronology that you were gradually establishing for your life (and even for your love), and to ensure that it both portrayed you as you wished to be seen and provided discourse of an exemplary rather than a personal kind, it still reflects, or rather helps to constitute, a further aspect of your role that speaks directly to us today. More than any other figure of the medieval world, you appear to us as what we would call a public intellectual. Your international standing, for instance among the familiars of King Robert of Sicily and of the Emperor Charles IV, not to mention of the foremost noble families; your vast network of friends and acquaintances: prelates and politicians, statesmen and rulers, soldiers and scholars, religious and laymen; and of course your reputation, much enhanced by the news of coronation, guaranteed you an audience, and your works a circulation. When you served as an ambassador – from the Visconti to the French King, or in the strife between Venice and Genoa for instance – it was as a disinterested scholar and man of letters, but with a political message. That that message should frequently have concerned the need for peace, a theme that also rings out from certain of your lyric poems, gives it continued resonance.

There is another aspect to this public role, which explicitly springs from the same concern with ascertaining the truth as lay behind much of your historical work, and that is your acerbic criticism of the corruption of the Papal curia in Avignon. “I shall write”, you say, “Truth will dictate, and all mankind will be witness. You, Posterity,

will judge, unless you are so overwhelmed by the evils of your own day that you cannot be bothered with ours". Faced with this challenge, we can today read the letters in your *Book without a Name* in the full knowledge that they are yours, despite the care that you took to anonymise them, and with a fair understanding of the figures and issues to which they refer. We can also situate your satirical zeal in the context of your political aim to see Rome restored as the seat of the Papacy. Our judgement is likely to be positive, both for the consistency of your aims and for the moral integrity that underlies them.

And that moral integrity has its own fascination, since it is mirrored, and in a way guaranteed, by the scrutiny of the soul that is the subject of your *Secret Book*. This is a unique record, which you seem to have intended no one to see in your lifetime, of self-questioning and self-awareness; it is in certain respects closely related to the no doubt partly fictitious account you give, in an overtly public letter of much the same date, of the ascent of Mont Ventoux. You analyse your motives and your state of mind through a dialogue between two characters representing yourself and St Augustine. It is no accident that this discussion takes place in the presence of a mute allegorical figure representing Truth. Yet, with the benefit of hindsight, we are aware that your Augustine quotes classical texts known to you but not to his historical counterpart, and that in other respects he speaks for one part of you rather than from the detachment of the distant past. But his moral and patristic authority nonetheless enables you to cast a semi-detached eye upon your dilemmas, to understand them, and yourself, better, and to demonstrate the fragility of our perceptions: the elusiveness of truth, and how little we know for sure. We would like to be able to ask you whether or not you intended us to see this work; it does not seem to us unreasonable to conclude that you did, and that you thereby gave us a privileged insight into the self-conscious workings of your mind which can only enhance our appreciation of you and them. But if our conclusion were wrong, and you had truly intended the book to remain secret, then our appreciation would only be all the greater.

When we started to reply to your letter, we were picking up a gauntlet that you had playfully cast down to us, and our response has largely been in your terms: what you did, and what you wrote. Behind this there is a more challenging interrogation, not just of you, but of ourselves: why should we still take an interest in you, and read your works? You lived, after all, in a profoundly different medieval world,

before the seismic shift produced by Gutenberg's invention, which itself is now overshadowed by the advanced technologies of the electronic age. You lived a socially privileged life, even if you claimed to prefer the solitude of your country retreats to the courts of your patrons; the studies that fascinated you, and for which you are famous, were the exclusive occupation of a small literary elite, even if you managed to bring them to the attention of statesmen and rulers. We do you a disservice if we try too hard to make you into the first modern man.

Imagine for a moment that instead of writing to posterity, you suddenly joined us now as a member of a network of international scholars with a research project on the ancient world supported by some European funding agency. We would welcome you as a seasoned scholar conducting curiosity-led research, and perhaps as a fine example of life-long learning. But we would soon come to blows: you would not understand our need for 'outcomes' delivered by deadlines: you would (and indeed did) perish rather than publish an imperfect work; you would doubtless be horrified by the indiscriminate information available to us on the internet and the demotic nature of our electronic conversations, not to mention the infinite fragility of the digital text. You would not wish to impart your knowledge in university lectures: only the most selective seminar could possibly appeal to you. Better a lifetime of cautious study and even more cautious composition; better limited but focused resources; better to read and absorb a single oration by Cicero than to scan the whole of his opus in seconds in search of a quotation, and then pass on to a quite different author or topic. Better to gather a personal library and enter into close communion with its contents than to have access to all the major libraries of the world: your dialogue on books in the *Remedies for Fortune* says it all. Yet you did intend your personal library to become a public one after your death...

You might possibly welcome our relative ease of travel (though today's hazards, while different from those that faced your age, are no less grave) yet the thoughtless and almost obligatory exploitation of that ease in the conference season would rob the activity of what for you was its profoundest purpose: the exploration of the self that was a direct consequence of journeying through space, and in the mind through time. You would certainly shun most of the required mechanisms of dissemination of research outcomes. You would, in short, rapidly be labelled an old-fashioned scholar.

There is the same blend of truth and travesty in this label as there is in that of the first modern man. And so we finally return to the challenge to ourselves. We have tried to give circumstantial reasons for continuing to read and study you; we have tried to point to some of the obvious differences that separate our age from yours. But there is also an obvious parallel: you were fascinated by the past, and passionately involved in the attempt to ascertain the truth of it for the benefit of at least the enlightened among your contemporaries and for posterity; in all of this you had an eye to the future. In engaging with your writings, and your life, we too are fascinated by the past, and probably, though we are less willing to admit it than you, have half an eye to the future. But our concern – if we have one – with the truth of your past is mediated by many distorting mirrors: our own self-consciousness which finds yours so fascinating and leads us to question not only your motives in writing but our own; our understanding of the rhetorical constraints under which you worked, and our inability to be sure where you elude them; our sense of the polyvalence of the written word, above all in poetry but also in prose compositions and even historical records; our anxiety at the relativity of truth; our awe at the literary monument and its creator.

Few of us today could match your achievements as a scholar, a man of letters, an intellectual, a diplomat, a cultural icon. So in the end, we find it difficult not to fall back on the temptations of our own ingenuity. To establish the perfect and definitive version of one your writings; to unearth a previously unknown borrowing by you from another author, classical or medieval; to catch you out changing dates or editing letters to suit your wider purpose, quoting without acknowledgement or even at second hand – all of these second-order activities save us from the much greater challenge of creating our own literary monuments. You were a scholar and a critic, but you were also a poet. Most of us can only manage to be one of these things at a time, and that is why you remain so fascinating, and so elusive, to us.

# Nonlinear wave motion and complexity\*

*Jüri Engelbrecht*

## **Abstract**

Contemporary complexity science deals with problems which involve many variables interacting with each other in such a way that a new quality appears. An important cornerstone of complex systems is nonlinearity. In this paper nonlinear wave motion in microstructured solids is analysed from the viewpoint of complexity. The basic models are derived by using the concept of internal variables which are related to dissipation inequality. The scale dependence results in wave hierarchies where dispersive effects are important. In such nonlinear models solitary wave structures may emerge – a typical sign of a new quality characteristic of complexity. In addition, examples from biophysics are presented, which demonstrate clearly the similarity to the ideas of complexity shown for waves in solids.

## **Key words**

Microstructured solids, Mindlin model, solitary waves, solitons.

## **1. Introduction**

The history of mechanics is full of remarkable ideas which have shaped the modern understanding of nature and technology. The list of celebrated examples is long: the movement of planets, a three-body system, movements of a pendulum and vibrations of a string, waves on a free surface of fluids, etc. A remarkable physical feature, called nonlinearity (i.e. additivity does not work), is naturally related to many physical phenomena and therefore it is not surprising that mechanics together with thermodynamics is a cornerstone of an interdisciplinary field of knowledge – complexity science. Complex systems, as a rule, are nonlinear. They are far from the equilibrium and exhibit the properties of the emergence of coherent structures.

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Typically such systems involve many variables (constituents) which interact with each other in such a way that a new quality appears. In terms of mechanics, we may recall that nonequilibrium systems are controlled by thermodynamics, the microstructure of solids (i.e. internal structure of materials) brings in the interaction effects, and constitutive laws or interaction forces are in many cases nonlinear. In terms of complexity science, mechanics has revealed many emergent and qualitatively new phenomena like solitons, attractors, phase transformation, coherent wave fields, etc. The analysis of complexity, however, faces a certain caveat. Said A. Toffler in his preface to the book by Prigogine and Stengers (1984): “One of the most highly developed skills in contemporary Western civilization is dissection: the split-up of problems into their smallest possible components. We are good at it. So good, we often forget to put the pieces back together again”. However, the idea of putting things back again is not new. Said Aristotle: “The whole is more than the sum of the parts”. And it is mechanics that has brought this old knowledge to our contemporary understandings. The basic notion which has “changed the world” is nonlinearity. Although the inverse-square law of gravitation was introduced by Newton, it was much later when H.Poincaré understood its importance when he solved the three-body problem. But only in the mid-twentieth century the concepts like solitons, chaotic attractors, and other members of the nonlinear ‘zoo’ made clear that a new quality is born when constituents of a whole interact with each other nonlinearly. Nonlinear dynamics has brought many new ideas not only to mechanics but also to many other fields – biology and chemistry, econophysics and social studies, etc., not speaking about many other physical processes. The reason is simple – the world around us is nonlinear and similar patterns emerge in different processes, similar methods can be used in studies of different fields, and the language of different studies is more understandable to the general community of scientists. Shortly, the world is complex and complexity research, as it is understood now, is an intrinsically transdisciplinary enterprise. The citation above by A.Toffler reflects the general view, but the monograph by Prigogine and Stengers (1984) itself is a proof of the contrary and describes the earlier ideas of complex systems. More recently, Nicolis and Nicolis (2007) summed up the main features of complexity science, but the full and state-of-the-art description of complex systems is presented in the “Encyclopedia of Complexity and System Science” (Mayers 2009).

Besides the main characteristics of complex systems mentioned above, the following should be stressed. First, an important issue in complex systems is their multi-scale structure: a system behaves differently at the macroscopic level than at the microscopic level. This leads to certain hierarchies which are linked physically and should also be reflected by proper mathematical models where scaling is of importance. Second, nonlinearity is also a prerequisite to chaos. But complexity does not mean directly a path to chaos; emergence usually occurs at the edge of chaos (Holland 1998; Taylor 2003). In this context it means that both order and chaos must be properly analysed. Mechanics is full of examples of chaotic motion starting from the three-body system and nonlinear pendulums to the celebrated Lorenz attractor which describes the convection in the atmosphere. In this paper the focus is on the analysis of waves in microstructured materials by taking the viewpoint of complexity. Attention is on the proper modelling of microstructure and the effects which follow from scaling and interaction between macro- and microstructure. In addition, some parallels are drawn from biophysics: the modelling of cardiac contraction where mechanics is interwoven with physiology and the ideas of internal variables derived in mechanics are used. In general, the paper reflects the studies of the Centre for Nonlinear Studies, Tallinn, in this field.

## **2. Waves in microstructured solids**

### **2.1. General theory**

The conventional theories of continua describe the behaviour of homogeneous solids resp. materials. In reality, however, materials are always characterized by a certain microstructure at various scales. The character of a microstructure can be regular (like in laminated composites) or irregular (like in polycrystalline solids or alloys). Even more, regularity and irregularity may be combined like for some FGMs. The characteristic scale  $l$  of a microstructure must always be compared with the spatial scale  $L$  of an excitation. Intuitively speaking, if  $L \gg l$ , then the excitation ‘does not feel’ the microstructure; if, however,  $L \sim l$ , then the excitation ‘feels’ strongly the microstructure. In general terms, the starting point for describing a microstructure could be either the discrete or the continuum approach. In the discrete

approach the volume elements are treated as point masses with interaction forces between them described by using assumptions on energy embedded into the system (Askar 1985; Maugin 1999). The system of governing equations is extremely large, creating enormous difficulties in numerical simulation, if it is altogether possible. The discrete approach is often used for laminated composites and then the effective stiffness theory may be useful (Santosa, Symes 1991). From the viewpoint of continua, the straightforward modelling leads to assigning all physical properties to every volume element  $dV$  in a solid, which means introducing the dependence on space coordinates. Thus, the governing equations are so complicated that only numerical simulation is possible. Although the discrete approach seems to be appropriate for modelling the microstructure, the question of how to determine the interaction forces in order to reflect material properties is difficult to answer. This is why generalized continuum theories enter. Generalized continuum theories extend conventional continuum mechanics for incorporating intrinsic microstructural effects into governing equations (Eringen, Suhubi 1964; Mindlin 1964; Eringen 1999). A leading concept is to separate the macro- and microstructure in continua and to formulate the balance laws for both structures separately (Eringen, Suhubi 1964; Mindlin 1964). However, a more sophisticated way is to introduce the microstructural quantities into one set of balance laws (Maugin 1993, 2006). It seems that such an approach is useful for two reasons: (i) it reflects clearly the mechanical structure of a solid; (ii) it allows further generalization in order to include internal variables and to cast more light on the thermodynamic character of wave motion. Here we refer to longer papers by Engelbrecht (2009) and Berezovski et al. (2010). First, Maugin (1993, 2006) has shown that on the material manifold  $M^3$ , the balance of the canonical (material) momentum reads

$$\left. \frac{\partial \mathbf{P}}{\partial t} \right|_{\mathbf{x}} - \text{Div}_R \mathbf{b} = \mathbf{f}^{\text{int}} + \mathbf{f}^{\text{ext}} + \mathbf{f}^{\text{inh}}, \quad (1)$$

where  $\mathbf{P}$  is the material momentum (pseudomomentum),  $\mathbf{b}$  is the material Eshelby stress, and  $\mathbf{f}^{\text{inh}}, \mathbf{f}^{\text{ext}}, \mathbf{f}^{\text{int}}$  are the material inhomogeneity force, the material external (body) force, and the material internal force, respectively. The energy balance is governed by

$$\left. \frac{\partial(S\theta)}{\partial t} \right|_{\mathbf{x}} + \nabla_R \cdot \mathbf{Q} = h^{\text{int}}, \quad (2)$$

where  $S$  is the entropy density per unit reference volume,  $\theta$  is the absolute temperature,  $\mathbf{Q}$  is the material heat flux, and  $h^{\text{int}}$  is the source term. The dissipation inequality in these terms is

$$S\dot{\theta} + \mathbf{S} \cdot \nabla_R \theta \leq h^{\text{int}} + \nabla_R(\theta \mathbf{K}), \quad (3)$$

where  $\mathbf{S}$  is the entropy flux and  $\mathbf{K}$  is the extra entropy flux which actually vanishes for most cases.

The free energy function  $W$  together with the first Piola-Kirchhoff stress tensor must be known in order to determine the needed variables  $P$ ,  $b$ , and forces and the source. Although the structure of the momentum equation shows explicitly how the forces are accounted for, the question of how to construct the free energy function remains.

One step forward to answer this question is to separate variables into observable and internal (Maugin 1990; Maugin, Muschik 1994). The observable variables are the usual field quantities like elastic strain or displacement, which are observable in the real sense of the word. Internal variables, however, are supposed to describe the internal structure of a solid (or a body, in general) and are observable but not controllable. This means that internal variables should compensate for our lack of a precise description of a microstructure. There are several examples (Maugin, Muschik 1994) which demonstrate how liquid crystals, damage, or dislocation movements can be described easily using the concept of internal variables. Recently the concept of internal variables has been used for describing the dynamics of microstructured continua (Berezovski et al. 2009).

The main idea is to introduce the internal variables into the free energy function. Then we can easily calculate all the needed forces but we need also governing equations for internal variables. This is obtained by satisfying the dissipation inequality. So we have followed the main idea – one balance law and all what is to be added come from the energy considerations. Let us consider first a single internal variable of state  $\alpha$  as a second-order tensor. Then the free energy  $W$  per unit volume is specified as a general sufficiently regular function

$$W = \overline{W}(\mathbf{F}, \theta, \alpha, \nabla_R \alpha), \quad (4)$$

where  $\mathbf{F}$  is the deformation gradient. Following Berezovski et al. (2009), it is possible to show that after calculating all the needed forces, the simplest choice for the governing equation for  $\alpha$  is

$$\dot{\alpha} = k(\mathbf{A} - \text{Div}_R \mathbf{A}), \quad (5)$$

where  $k \geq 0$  and

$$\mathbf{A} := -\frac{\partial \bar{W}}{\partial \alpha}, \quad \mathbf{A} := -\frac{\partial \bar{W}}{\partial \nabla_R \alpha}. \quad (6)$$

This is actually a reaction-diffusion equation which can be found in numerous applications. It means that the microstructure is not inertial. If we introduce dual internal variables  $\alpha$  and  $\beta$ , then the situation is different (Ván et al. 2008). We now assume

$$W = \bar{W}(\mathbf{F}, \theta, \alpha, \nabla_R \alpha, \beta, \nabla_R \beta). \quad (7)$$

In order to satisfy the dissipation inequality, the simplest forms of evolution equations for  $\alpha$  and  $\beta$  are

$$\begin{pmatrix} \dot{\alpha} \\ \dot{\beta} \end{pmatrix} = \mathbf{L} \begin{pmatrix} \tilde{A} \\ \tilde{B} \end{pmatrix} = \begin{pmatrix} \mathbf{L}^{11} & \mathbf{L}^{12} \\ \mathbf{L}^{21} & \mathbf{L}^{22} \end{pmatrix} \begin{pmatrix} \tilde{A} \\ \tilde{B} \end{pmatrix},$$

$$\tilde{A} = \mathbf{A} - \text{Div}_R \mathbf{A}, \quad \tilde{B} = \mathbf{B} - \text{Div}_R \mathbf{B}, \quad (8)$$

$$\mathbf{A} := -\frac{\partial \bar{W}}{\partial \alpha}, \quad \mathbf{B} := -\frac{\partial \bar{W}}{\partial \beta},$$

$$\mathbf{A} := -\frac{\partial \bar{W}}{\partial \nabla_R \alpha}, \quad \mathbf{B} := -\frac{\partial \bar{W}}{\partial \nabla_R \beta},$$

where the components of the linear operator  $\mathbf{L}$  are dependent on state variables. Let us consider a non-dissipative process and assume a quadratic dependence of the free energy with respect to  $\beta$ . Then from

$$\dot{\alpha} = L^{12} \tilde{B}, \quad \dot{\beta} = -L^{12} \tilde{A} \quad (9)$$

that provides the vanishing dissipation, we obtain

$$\ddot{\alpha} = (\mathbf{L}^{12} \cdot \mathbf{L}^{12}) \cdot \tilde{A}, \quad (10)$$

which is a hyperbolic evolution equation for the internal variable  $\alpha$ . In physical terms it means that the inertia of the internal variable is taken into account.

## 2.2. Mathematical models

Based on arguments in Subsection 2.1, we present here the mathematical models for longitudinal waves in the 1D setting. It has been shown by Engelbrecht et al. (2005) that the Mindlin model can also be

represented by the approach using the material momentum (cf. Eq. (1)). Recently Berezovski et al. (2009, 2010) have shown that, by using the concept of dual internal variables again, the same result can be obtained. Therefore, here we shall omit the details of derivation and focus on the analysis of models. The governing system is then the following:

$$\rho_0 u_{tt} = a u_{xx} + N u_x u_{xx} + A \psi_x, \quad (11)$$

$$I \psi_{tt} = C \psi_{xx} + M \psi_x \psi_{xx} - A u_x - B \psi. \quad (12)$$

Here  $u$  denotes the longitudinal (macro)displacement and  $\psi$  – the microdeformation (according to the Mindlin model) or the internal variable (according to the concept of internal variables). Further,  $\rho_0$  is the density and  $I$  inertia of the microstructure, while  $a, A, B, C, N, M$  are the material parameters specifying the free energy function (see Engelbrecht et al. 2005). We need to introduce a scale parameter  $\delta \ll 1$  which characterizes the smallness of the microstructure and another parameter  $\varepsilon \ll 1$  which emphasizes that the displacement  $u$  is small compared to the reference length. After introducing the dimensionless variables  $U, X, T$  and applying the ‘slaving principle’ (see for details Engelbrecht et al. 2005), system (11), (12) is reduced to one equation

$$U_{TT} = \left(1 - \frac{c_A^2}{c_0^2}\right) U_{XX} + \frac{1}{2} k_N (U_X^2)_X + \frac{c_A^2}{c_B^2} \left( U_{TT} - \frac{c_1^2}{c_0^2} U_{XX} \right)_{XX} + \frac{1}{2} k_M (U_{XX}^2)_{XX}, \quad (13)$$

where  $c_0, c_1, c_A, c_B$  are velocities and  $k_N, k_M$  are the parameters expressing the strengths of physical nonlinearities on macro- and microscale, respectively. The small parameters are embedded into the coefficients of Eq. (13). The linear approximation

$$U_{TT} = \left(1 - \frac{c_A^2}{c_0^2}\right) U_{XX} + \frac{c_A^2}{c_B^2} \left( U_{TT} - \frac{c_1^2}{c_0^2} U_{XX} \right)_{XX}, \quad (14)$$

demonstrates clearly the hierarchical nature of the process: if  $c_A^2/c_B^2$  is small, then waves are governed by the properties of macrostructure; if, however,  $c_A^2/c_B^2$  is large, then waves “feel” more microstructure. In the absence of interaction between macro- and microstructure (i.e. when  $A = 0$ ), the wave operator in terms of  $U$  is simply  $U_{TT} - U_{XX}$ . It is possible to develop such a hierarchical modelling further by introducing multiple scales. Following the Mindlin ideas, it means that every deformable cell of the microstructure includes new deformable cells at a

smaller scale (Engelbrecht et al. 2007a). The nonlinear effects in the models above include also dispersive effects caused by the microstructure. This means that soliton emergence is possible when there is a balance between nonlinear and dispersive effects. Indeed, it has been shown (Janno, Engelbrecht 2005a; Engelbrecht et al. 2007b) that the models like Eq. (13) lead to the emergence of solitary waves. As Eq. (13) is a two-wave equation, it is possible to show that left- and right-going soliton trains emerge from a single initial excitation. The influence of nonlinearity on the microlevel affects the emergent waves, making them asymmetric (Janno, Engelbrecht 2005a).

### 3. Mechanics to biophysics

Mathematical modelling of biological processes and biomechanics means describing the physiological phenomena and structural behaviour of living tissues, organs, cells, neuronal networks, etc. There are many specific features which must be taken into account (Vendelin et al. 2007):

- biological systems need energy exchange with the surrounding environment and represent the systems far from the thermodynamic equilibrium;
- the processes operate over different time scales, are spatially extended, and include many hierarchies;
- in physical terms, the models should account for nonlinearities, dissipation, activity/excitability, spatiotemporal coupling, etc.

These features are characteristic of complex systems and biophysics, nowadays clearly a part of complexity science under the chapter “systems biology” (Kitano 2001). The existence of scales and, consequently, hierarchies must, however, be explained in more detail (Vendelin et al. 2007). Namely, in biological tissues one should distinguish two possible types of hierarchies: (i) a *structural hierarchy* which involves strong dependence on length scales like in mechanics (see Section 2) and (ii) a *functional hierarchy* meaning that at various levels of scale, various dynamical processes are of importance, all of which influence the behaviour on the macroscale. *Structural hierarchies* actually reflect the enormously rich architecture of biological tissues. The fundamental structural hierarchy is *atom*  $\rightarrow$  *molecule*  $\rightarrow$  *cell*  $\rightarrow$  *tissue*

→ *organ* → *human*. But tissues have themselves a complicated structure which should be taken into account when stresses and strains in tissues are calculated. In this sense living tissues resemble microstructured man-made materials. For example, for heart contraction the structural elements in the hierarchy are: *sarcomeres* → *myofibrils* → *fibres* → *myocardium* → *heart*. *Functional hierarchies* reflect the complexity of functioning biosystems. The same example of heart contraction has the following functional hierarchy: *oxygen consumption* → *energy transfer* → *Ca<sup>2+</sup> signals* → *cross-bridge motion* → *contraction*. The concept of internal variables, explained briefly above and used for microstructured materials, can effectively be generalized for description of hierarchies in biotissues. A structural hierarchy can be easily described by the theory presented in Section 2; a functional hierarchy needs a generalization (Engelbrecht et al. 2000). The idea is the following (Engelbrecht, Vendelin 2000; Vendelin et al. 2007). In addition to an observable variable  $\chi$ , there is a set of internal variables  $\alpha, \beta, \gamma, \dots$ . Any dependent variable, say  $\sigma$ , is then calculated by an expression

$$\sigma = \sigma(\chi, \alpha). \quad (15)$$

The internal variable  $\alpha$  is governed by an evolution equation

$$\dot{\alpha} = f_1(\chi, \alpha, \beta), \quad (16)$$

the variable  $\beta$  by

$$\dot{\beta} = f_2(\chi, \alpha, \beta, \gamma, \dots), \quad (17)$$

and  $\gamma$  by

$$\dot{\gamma} = f_3(\chi, \alpha, \beta, \gamma, \dots). \quad (18)$$

Clearly the internal variables  $\alpha, \beta, \gamma$  form a hierarchy which corresponds to the physical/chemical processes in the functional hierarchy. Such an approach is used for modelling cardiac contraction (Engelbrecht et al. 2000; Engelbrecht, Vendelin 2000). Here the *structural hierarchy* starts from myofibrils which are composed of repeating units of myosin and actin filaments, called sarcomeres. The actin filaments are made of a double helix of actin molecules with troponin molecules localized in certain intervals. The myosin filament consists of myosin proteins with certain spatially localized meromyosin molecules with heads resembling ‘golf-clubs’. These heads are called cross-bridges. The excitation of a muscle is triggered by an action potential from the conducting system. This potential in its turn releases Ca<sup>2+</sup> ions in the

sarcotubular system, which then activate the troponin molecules so that they will be able to attach the heads of myosin molecules. This attaching means swivelling of myosin molecules that cause sliding the actin and myosin filaments against each other, and as a result stress is created. An ingenious mechanism, indeed.

The *functional hierarchy* starts from the cross-bridges producing force. Two states produce force and the relative amounts of those cross-bridges,  $\alpha_1$  and  $\alpha_2$ , are the internal variables of the first level. The next level is the number of all activated cross-bridges  $\beta$ , which is the second-order internal variable. This internal variable in its turn depends on the  $\text{Ca}^{2+}$  signal, which is the third-order internal variable. The calculations start from the bottom, i.e. from the third level and work step by step up to dependent variable, which in this case is the active stress.

The calculations for contraction of the left ventricle by such an approach have shown good matching with measured results (Vendelin et al. 2000). Another good example of how the notions of mechanics can put biophysical studies into a wider context is the nerve pulse transmission. A nerve pulse is actually an action potential which is transmitted down the axoplasm core of a nerve fibre. The process is accompanied by ion currents through the membrane between the core and the surroundings. These currents actually ‘feed’ the process with energy and as a result, a stable asymmetric solitary nerve pulse propagates along the fibre. The celebrated Hodgkin–Huxley model has specified the ion currents by introducing three variables called ‘phenomenological’ (Hodgkin, Huxley 1952). These variables govern:  $n$  – the potassium conductance (turning on), and  $m$ ,  $h$  – the sodium conductance (turning on and off, respectively). A very useful simplification of the model is called after FitzHugh–Nagumo, which includes only one ion current called ‘recovery’ variable. These phenomenological and/or recovery variables are actually internal variables in terms of continua. Maugin and Engelbrecht (1994) have shown how to use the formalism of internal variables for the Hodgkin–Huxley and FitzHugh–Nagumo equations.

#### **4. Final remarks**

Nonlinearities in wave motion are important because nonlinear models are able to describe important physical effects like distortion of wave

profiles (spectral changes), amplitude-dependent velocities, interaction of waves, etc. going also beyond the elastic limit. However, nonlinear effects are usually combined with other effects – dispersion, dissipation, forcing, and coupling with other fields (Engelbrecht 1997). These combinations will in many cases bring in even more effects and the signatures of complexity are clearly seen. So, for example, nonlinearities combined with dispersive effects lead to coherent wave structures, scale dependence, hierarchies, etc. Characteristically to complexity science, the different fields are related by phenomena, methods, and language. The concepts elaborated in mechanics can be generalized, as shown above, to biophysics. The waves in solids and fluids are similar in many respects, as explicitly demonstrated by solitons. Besides general analysis of complexity of waves in solids, the applications are important. For example, the knowledge of the influence of the microstructure on phase velocities or asymmetry of solitary pulses opens new ways for solving the inverse problems (Janno, Engelbrecht 2005bc, 2008). Certainly there many challenges for further studies. A great challenge is to build multiscale models which relate mesoscopic physics to continuum mechanics reflecting the existence of nonlinearities over the scales, dispersive/dissipative effects, and thermodynamical consistency.

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**Annex**  
**Selected talks 2006-2011**



## Selected talks 2006-2011\*

*Jüri Engelbrecht*

*European research perspectives in the new countries of the EU.* Conference “European Science: a Modern Interpretation of Basic and Applied Research”, Vienna, January, 2006.

*Science, technology and talents.* Conference Urban Futures 2.0, Stockholm, May, 2006.

*Academia and society.* Conference on occasion of the 40<sup>th</sup> Anniversary of the Konstanz University, Konstanz, June, 2006.

*European research policy.* Talk at the Royal Society Edinburgh, Edinburgh, October, 2006.

*ALLEA activities.* IAP General Assembly meeting, Cairo, November, 2006.

*Cooperation and clusters.* Conference of European Organisations on Cooperation in ERA, the Hague, December, 2006.

*Excellence in science.* ERC Launching Conference, Berlin, February, 2007.

*ALLEA activities.* US National Science Board Roundtable, Brussels, March, 2007.

*ALLEA activities.* Seminar on the Role of Research Councils in ERA, Budapest, April, 2007.

*Changes in society and values.* Symposium on Science, Technology and Human Values, Academy of Athens, Athens, May, 2007.

*ALLEA unites the voice of European academies.* Conference “Foundations and Associations for Innovation and Economy: Europe and Italy”, Milan, May, 2007.

*Striving for excellence in the ERA.* Talk at the Xian Jiaotong University, Xian, August, 2007.

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\* The talks at the ALLEA GA meetings and other ALLEA events, the scientific talks at various conferences as well as the talks at the meetings of the Estonian Academy of Sciences are not included.

*ALLEA activities.* IAP Executive Committee meeting, Canberra, October, 2007.

*Optimising research programmes and priorities.* EU Conference “The Future of Science and Technology in Europe”, Lisbon, October, 2007.

*ALLEA activities.* Meeting of European Academies, Institute de France, Paris, October, 2007.

*Address on behalf of ALLEA,* the 40<sup>th</sup> Anniversary of the Macedonian Academy of Sciences and Arts, Skopje, November, 2007.

*Advisory role of academies.* Conference “Promoting Science in the Service of Society”, Berlin-Brandenburg Academy of Sciences, Berlin, January, 2008.

*The role of ALLEA in uniting European academies.* General Assembly of the Academy of Sciences of the Czech Republic, Prague, April, 2008.

*The role of ALLEA in ERA.* Mediterranean Scientific Conference, French Academy of Sciences, Paris, June, 2008.

*Address on behalf of ALLEA.* South-Eastern European Forum and Ministerial Round Table, Budva, July, 2008.

*The role of frontier science in shaping society.* World Economic Forum Annual Meeting of New Champions, Tianjin, September, 2008.

*ALLEA unites the national academies.* Conference “Role of National academies in the 21<sup>st</sup> Century”, Podgorica, October, 2008.

*Research universities in ERA.* Conference in Tartu University, Tartu, November, 2008.

*Globality in research needs concerted actions.* Conference “Scientific Research as a Global Challenge”, NWO, the Hague, December, 2008.

*ALLEA activities in ERA.* EU Conference “The Role of Basic Research in the Process of Structuring the ERA”, Prague, April, 2009.

*Perspectives of Young Academies.* EU Conference “Researchers in Europe without Barriers”, Prague, April, 2009.

*European academies and research.* Conference “European Research on the Move”, Wroclaw, September, 2009.

*Has the ERC fostered the scientific excellence so far.* Seminar on the Mid-term Review of the ERC's Structures and Mechanisms, Brussels, September, 2009.

*Introductory address.* Conference "Silverwhite Route: following Pytheas and Lennart Meri", Tallinn, October, 2009.

*Academies in the world of science and knowledge.* Jubilee Conference for Celebrating the 50<sup>th</sup> Anniversary of the Israel Academy of Sciences, Jerusalem, March, 2010.

*Complex systems and the complexity of state.* Seminar on the Complexity of State, Tallinn, April, 2010.

*ALLEA activities.* OECD Seminar on the Role of the Independent Analysis, Tallinn, June, 2010.

*Young researchers in ERA.* Meeting of Vyšehrad Academies, Třešť, September, 2010.

*Academia and scientific integrity.* Conference "Current Challenges in Medical Communication: Diagnosis and Curing Unethical Practices", Warsaw, October, 2010.

*Criteria for mapping academic excellence.* Conference "Mapping of Academic Excellence in the Context of Quality Assurance", Maribor, October, 2010.

*Importance of basic research.* EU Conference "Joint Programming in Research", Brussels, October, 2010.

*ALLEA role in uniting academies.* The 12<sup>th</sup> Baltic Conference on Intellectual Co-operation, Vilnius, November, 2010.

*Synergy between science policies of European countries: ALLEA experience.* Conference "Research and Development as the Basis for Innovation in Creating the Competitive Region", Podgorica, November, 2010.

*Science policy in Europe and the role of academies.* Talk at the Academy of Sciences Lisbon, Lisbon, November, 2010.

*Complex systems.* Talk at the meeting of the Academic Council of the State President of Estonia, Tallinn, March, 2011.

*Address on the behalf of ALLEA.* Meeting on the occasion of the 70<sup>th</sup> Anniversary of the Lithuanian Academy of Sciences, Vilnius, March, 2011.

*Address on behalf of ALLEA.* Meeting on the occasion of the 150<sup>th</sup> Anniversary of the Croatian Academy of Sciences and Arts, Zagreb, April, 2011.

*Research in Estonia over 20 years.* Conference on the occasion of the 20<sup>th</sup> Anniversary of Re-Instating the Independence of Estonia, Tallinn, August, 2011.