Humanities Scientific Committee Opinion Paper

Radical Innovation: Humanities Research Crossing Knowledge Boundaries and Fostering Deep Change

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Conceptual Framework and Aims

> Horizon 2020… promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.[1]

There is a paradox concerning innovation in European research. For centuries Europe has been the place of intellectual, economic and technological innovation, but recently there has been widespread discussion about Europe losing its leading position. Research-based innovation is presented as a fundamental principle for societal development, but the instruments for funding contemporary research remain largely mainstream and bound, in the best case, to forms of incremental innovation.

Interestingly, other cultural and economic regions where there is growing attention to innovation, such as Asia, are increasingly recognising the crucial role of the arts and humanities as part of the processes of innovation, whereas in Europe the arts and humanities tend to be given only a marginal role in interdisciplinary research.

This Opinion Paper shows how arts and humanities research is at the heart of innovation processes. In this paper the Science Europe Scientific Committee for the Humanities advocates the need for a wider and deeper understanding of the concept of innovation, in order to better prepare Europe to tackle global challenges. The Committee points out ways to achieve stronger European leadership through the promotion of radical innovation by highlighting the contribution of arts and humanities research.

This Opinion Paper addresses the challenges of innovation which, although commonly perceived as a technology-driven phenomenon, is present in all forms of research and human endeavour. Indeed, innovation is evident across the whole breadth of human experience including, for example, all cultural systems of thinking, belief and values that determine who we are and how we feel. In this respect, innovation emerges from a research environment that has the human condition at its very core.

Social innovation on the one hand and technology-driven innovation on the other are both essential elements in the creation of a new research-centred innovation ecology for the 21st century, which is essential for new emerging areas of study such as, for example, medical, environmental and digital humanities. These are the result of the successful interaction between disciplines that set the conditions for imagination and creativity and, therefore, for radical innovation to take place.

In this framework, the arts and humanities are helping not only to support the process of understanding how things happen but they are protagonists in explaining why they happen and, in so doing, they help to design the world.

The first part of this Opinion Paper addresses the concept and definition of innovation, according to the arts and humanities approaches, as a means to identify the tools to realise innovation, as well as identifying the existing patterns of innovation in humanities research around the world.

The second part of the paper is dedicated to different forms of innovation. Examples are given for types of innovation which are generated by scientific projects that take into account the actions of social actors in the world and that change their lives and ways of behaving.

Other examples concern those innovations that happen in the context of research itself (methods and organisation of the work in teams). The examples of existing projects and innovative humanities research initiatives will be used as cases at hand to highlight the different types of processes that drive innovation.

The third part of the paper focuses on recommendations and suggestions to indicate possible strategies to improve the ways in which scientific policies and funding strategies may support radical, as opposed to incremental, innovation.

Understanding the Definition of Innovation: a Deep Process to Tackle the Essence of Societal Challenges

Understanding innovation and the innovation process is a key responsibility for Europe to enable it to compete with other countries which are advancing more rapidly in creating the necessary conditions for radical innovation to be stimulated and nurtured from the ground. If Europe aims to nurture an innovation ecology where breakthrough answers may emerge in response to major societal challenges such as climate change, health, food security, or access to clean water, conditions need to be created that lead to the 'unanticipated' answers that are capable of producing radical innovation and hence radical changes.

In 2008 the British National Endowment for Science Technology and the Arts (NESTA) and the Arts and Humanities Research Council (AHRC) published a report entitled 'Arts and Humanities Research and Innovation'.[2] The report highlights the ways in which traditional understanding of science and technology based research have tended to overshadow the role of arts and humanities research and its contribution to innovation.

In particular, the report demonstrates how the legacy of technology transfer models and traditional definitions of research and development (R&D) have had "a damaging effect on the innovation system". It points out that research in the sciences, technologies, arts and humanities is not hierarchically ordered; rather the various elements complement each other in the creation of an innovation ecology.[3] Generally, innovation grows at a faster rate when this integration of research disciplines ensures that technological developments are linked to their cultural acceptance.[4]

In recent years the countries of Southern Asia have been working to transform their traditional cultures of reproduction into ones of innovation. In this respect they now see innovation as the key driver of economic growth and an agent for social change in the 21st century. Because innovation is given the highest priority in Southern Asia, the Organisation for Economic Co-operation and Development (OECD) convened an international workshop in 2013 in Singapore entitled 'Educating for Innovation in Asia: The Theory, the Evidence and the Practice'. Overall, this workshop demonstrated that the human qualities and competences most closely associated with arts and humanities are at the heart of a new education system in which cultivation of the human mind's capacity for innovation is a key priority.

In the context of Southern Asia it is now recognised that human capital, not technological development alone, is at the heart of innovation. Accordingly, Singapore gives "top priority to human capital formation policies" that encourage a "holistic education around four key outcomes: personal confidence, self-directed learning, active contribution and concerned citizenship". Overall, competences in critical thinking, creative practice, reasoned argument, social engagement, and teamwork and character formation are now central to this approach to innovation.[5]

From this perspective, it is striking to note that the historic centrality of arts and humanities research in Europe has recently been shifted to the outskirts of public investment in research at a time when competitor nations are prioritising such competences as the drivers of innovation. The OECD workshop in Singapore also highlighted a difference in appetite for innovation between developed and developing economies: the participants stressed that the former become complacent and satisfied with incremental, non-disruptive innovation. If this is true of the developed economies in Europe then this satisfaction with incremental innovation, at the expense of disruptive or radical innovation, needs consideration.

Incremental innovation dominates research cultures where technical advance has precedence over social and cultural innovation. Furthermore, the advantages of incremental innovation, in a world of publicly funded research, are that it provides higher degrees of certainty, predictability and accountability. This said, continuous refinements over time may not deliver the radical solutions needed to address major societal challenges such as climate change, health, food security, or access to clean water. These challenges cannot be solved through incremental innovation: they demand greater urgency in the quest to find those breakthrough solutions born out of radical thinking.

Most of the major challenges of our complex, dynamic societies are global in nature and require collaboration across the international research community. For this reason, research-driven robust solutions to identified problems need to be combined with transformative approaches, radical thinking and cultural–scientific environments where creativity and imagination can be nurtured. These contexts and approaches are the ones that solely can create genuinely 'game-changing' answers to the major challenges of our societies, transforming the ways in which we conceptualise, manage, study and co-exist in the world.

This transformative power is the source for new indispensable ways to orient and approach emerging and complex problems which imply, for example, that previously recognised ways of doing things become redundant or that radically new answers are needed to accompany innovation and change with concomitant social and cultural transformation.

Indeed, radical innovation is to be seen as a new guiding principle between the two more traditional ways of looking at problem-solving: the incremental and short-term responses given to specific identified problems on the one side, and the very abstract approaches looking at practical usefulness and general relevance of research and science on the other.[6] Radical innovation is a new way of designing the world for change.

Radical innovation can be considered as a system of critical and disruptive thinking about a specific condition or set of conditions in order to advance changes in practice. This can often transform previous approaches and action patterns through a paradigm shift. Disruptive, or radical, innovation has after-effects that stimulate human behaviour in often unanticipated and unpredictable ways. These changes bring risks and fresh opportunities in their wake: they bring deep change to the ways in which we live, interact, communicate, think and act. They are new ways of acting and doing things.

However, in order to be clear about the relevance and potential of radical innovation as compared to creativity, one needs to bear in mind a fundamental distinction: whereas creativity is the capability or act of conceiving something original or unusual, innovation implies a deeper and concrete further step, which is to put a process into action and create the conditions for the implementation of something new. In the same way, innovation has to be kept at a separate level of analysis from impact as there are processes of innovation that can only generate long-term impact, and there are forms and types of innovation that provide no direct result in terms of practical consequences or that can even generate negative impacts.

Besides, the impact of research-driven innovation may happen in ways that are either tangible or intangible. There is a process of nurturing thinking and research which sets up the conditions for the development of a highly innovative intellectual framework within which innovation of different kinds and models emerges.

This Opinion Paper highlights the fundamental changes that arise from a variety of examples in forms and types of innovation that influence the understanding of innovation processes with a wider and deeper reflection on the research areas and the scientific efforts involved, both within the humanities and within their interaction with other fields of sciences.

Types of Innovation: from Systemic Changes to New Paths for Knowledge Mobility and Exchange

As priorities shift from curiosity-based to challenge-driven research, so the urgency increases to create innovation ecologies that integrate research domains across the sciences, technologies, arts and humanities.

The formation of multi-disciplinary teams is, therefore, an essential element of future research if the skills needed to solve complex challenges are to be aligned.[7] In seeking answers for major societal and environmental challenges we need radical innovation to help propel us beyond the narrow confines of a disciplinary field.[8]

We need imaginative ways to pool and focus our collective knowledge in order to solve real-world challenges.

At the same time, behavioural changes and new systemic approaches to the organisation of science, or of disciplines within the same field of science, have a significant influence on the methods used by humanities scholars to work together and face problems or research questions in a fundamentally new way.

Furthermore, some of the most recent arts and humanities experiences show how creative, comparative and cultural or inter/transcultural practices – which are typical features of arts and humanities research – can be effectively combined with a technological dynamic approach to innovation.

The examples below showcase four main types of innovation in the arts and humanities. The examples may fit into one type of innovation, or may combine more than one form of innovation:

a) Successful *interdisciplinary collaboration* across the arts and humanities and natural/life sciences.
b) Successful *arts and humanities driven contributions*.
c) Innovative *ways of conducting research* within research teams, including ways of organising the work affecting the micro-practices of actually conducting research as well as the outputs of research, or involving the integration of lay participants in the research itself and/or in the process.
d) Innovative research in the humanities which *generates changes and societal impact*, either by transforming ways of thinking (reconceptualising issues and looking at problems in a different way) or provoking social change and practical outcomes in the way of acting.

At the end of each of the following case studies, a table shows the different aspects of innovation which have been undertaken by the project, according to the four main types of innovation identified above.

1. An Innovative Contribution to the Study of Psychosis with an Interdisciplinary Perspective

Understanding the Relations Between Psychosis and Urban Settings: an Experience-Based Approach

Ongoing Project, funded by the Swiss National Science Foundation. Led by the Institute of Geography at the Faculty of Humanities, University of Neuchâtel (Switzerland)

Since the end of the 1930s, a higher incidence of psychosis in urban areas has been observed.The scientific community has increasingly realised that this phenomenon is not only linked to a higher presence of people at risk in urban areas, but that there are also very important environmental and social factors that generate the illness itself.

Most of these dynamics are however still unknown and the level of interdependence between urban factors and the medical condition remains to be explored.

This interdisciplinary research, jointly led by the Institute of Geography at the University of Neuchâtel and the Department of Psychiatry at the Centre Hospitalier Universitaire Vaudois (CHUV) in Lausanne, and in collaboration with the Department of Linguistics at the University of Basel, aims to better understand the direct relationship between the urban milieu and psychosis in young people.

The project is based on an original collaboration between geographers, psychiatrists, and linguists aimed at studying together the effects of city life, and particularly of stressful urban environments, on psychosis.

The project represents a novelty for different reasons, notably for the radically new approach used to look at patients. Patients are generally observed and treated by medical and psychiatric teams in institutional healthcare centres. As a consequence, both from a clinical and scientific perspective, the way that patients experience everyday life escapes observation.

This project puts a strong emphasis on urban settings and on the social life of the patients and therefore introduces new conceptual categories that do not draw solely on well-known clinical categorisations. Consequently, the perspective shifts from the clinical and medicalised condition of the patients to the everyday life of young citizens, revealing not only how they cope with their illness but also how they live a normal life.

In addition, the new focus on the urban practices of these young people, the way they talk and bodily move in the city, allow the researchers to work on new diagnostic features. For these reasons the project reveals new diagnostic aspects that were unobservable within specialised healthcare settings. The outputs of the project are important both for developing new therapeutic treatments and for a better understanding not only of the pathology but also more generally of negative effects of urban stress and of the need to reorganise both urban structures and healthcare institutions and settings accordingly.

ASPECTS OF INNOVATION	
a) Interdisciplinary collaboration	Geography, Linguistics, Psychiatry, Sociology, Urban studies
d) Innovative ways of doing, generating social impact and transforming the way of thinking	New way of thinking about healthcare problems by reconceptualising the issue based on social–environmental factors

2. Learning from History and Archaeology to Assess the Use of Natural Resources such as Water and Soil

Memola Project: an Innovative Approach To Cultural Landscapes

MEMOLA (Mediterraneous Mountainous Landscapes), funded by the EU 7th Framework Programme for Research and Technological Development

Through the promotion and development of new methodologies for the study of cultural landscapes, combining the principles of archaeology with modern hydraulic and soil analysis techniques, the Memola Project is an example of a successful contribution of the humanities themselves to improve the conservation of cultural landscapes thanks to new approaches in resource-use efficiency traditions.

The key innovative aspect of this project is that it introduced the historical perspective in landscape studies by investigating a series of Mediterranean mountainous landscapes through the analysis of productivity and resource-use efficiency in four sample areas. This project highlights a radical approach to natural resources – namely water and soil, which are essential to generate agro-systems – based on the collection and examination, through archaeological fieldwork and ethnographic surveys, of the historical traces that remain fossilised in the landscape.

Activities and new methods have included: hydraulic surveys with archaeological excavation in specific sites strongly related to the performance of the productive activities; ethnographic studies of rural communities such as irrigators' communities; analysis of the area by remote sensing; comparative analysis of historical and current land parcels for the reconstruction of the old field boundary pattern and the changes that have been occurring over time; assessment of changes in land use and management from an historical perspective and with a specific focus on the recent changes induced by globalisation and economic crises.

Identification of limiting factors and of the drivers of changes via the development of alternative scenarios have been developed together with field surveys designed to collect a variety of data types, including archaeological artefacts, monumental ruins, geo-morphological elements, land and soil composition, hydrology, and other information regarding the cultural landscape of the area. The study areas (Sierra Nevada, Spain; Colli Euganei, Italy; Vjoasa Valley, Albania; Monti di Trapani, Italy)

have therefore been investigated from a social and environmental point of view, which has enhanced their heritage and natural value and helped to outline a historical trajectory of agroecosystems leading to the creation of a 'High Nature Value farmland'.[9]

"Landscapes and their structure are strongly conditioned by the need to ensure the livelihood of rural communities over time. Essentially they are the spatial representation of production and reproduction strategies of societies over time. Understanding them necessarily requires knowledge of the historical processes that have led to specific relationships with nature: mainly extraction and use of resources. These uses have largely shaped the medium, generating not only its shape, but also the culture that makes possible its management and maintenance."[10]

The project involved specialists from different disciplines and combined skills from both humanities and natural-scientific aspects, and in addition with a view to new forms of job creation. The project has also propelled innovative ways of organising such work by involving a wide partnership of both universities from the four study areas and local communities from different cultural and rural associations working on the ground within the sites involved in the project.

ASPECTS OF INNOVATION	
a) Interdisciplinary collaboration	Agronomy, Archaeology, History, Botany, Hydrology, Geology, Ethnography, Pedology (a + b)
b) Successful contribution of the humanities	
c) Innovative ways of doing and organising working methods	Local Development, Education, Cultural Thematic Routes, Documentaries, Exhibitions

3. Design and Environmental Humanities: Innovation with Real-world Impact

Microcab: Realising a Hydrogen Economy
Research leader: Coventry University (UK) – Research Excellence Framework (REF) 2014 Case Study[11]

By producing dual electric/hydrogen-powered vehicles to address urban pollution, 'Microcab' research has influenced policy decisions related to hybrid hydrogen and electric vehicles in the UK, Europe and South Africa.

The core innovation of this project consists in having pushed the boundaries of alternative fuels design and technology, by supporting the economic prosperity of the automotive industry and its supply chain and by influencing policy makers to invest in hydrogen.

Microcab addresses the need to increase the uptake of low-carbon vehicles and to improve urban air quality. To achieve this result Microcab has collaborated with a wide range of industrial partners.

The unique approach has delivered production versions of small, economical hydrogen-fuelled cars several years ahead of larger competitors. In doing so it has delivered economic benefits to a number of organisations by enabling them to diversify into this new market.

In addition, the research has had an impact on local, national and international policy, with respect to the adoption of hydrogen-fuelled cars and supporting infrastructure.

Highlights of the most significant results include: deployment of the UK's first hydrogen vehicle fleet in 2009, nomination for the Condé Nast Award: Innovation & Design in 2012, and an invitation to join the SWARM project (a demonstration of small four-wheeled fuel cell vehicles[12]) as a pan-European hybrid vehicle demonstrator, 2012. Beneficiaries include Horizon Fuel Cell, Westfield and Lotus (new products developed), and the South African and Scottish governments (hydrogen economy development).

To take the research from initial design to full EU-type approval in 2010 required a research and development (R&D) grant-funded budget of less than £3 million. This compares very favourably with larger Original Equipment Manufacturers (OEM), who have R&D spends typically in excess of hundreds of millions of pounds and are a long way behind Microcab. The R&D focused on usable design and ergonomics, availability, practicality, robustness, affordability, and avoidance of the risk associated with emerging 'exotic' technologies.

Government, energy, automotive and academic experts were engaged at international levels to leverage world class skills and expertise. These collaborations improved the speed of delivery and reduced the budget. Positive economic and social impacts from the research evidenced the feasibility of incorporating hydrogen vehicles into the global transport mix, and the potential for a new market opportunity for the platinum, fuel cell and wind energy sectors.

ASPECTS OF INNOVATION	
c) Innovative ways of doing and organising working methods	New approaches in the alternative fuel design methods and technology Involvement of non-research actors in the process
d) Innovative ways of doing, generating social impact and transforming the way of acting	Environmental impact/economic impact/ impact on policy makers (in the UK, the government allocated £400 million to deliver programmes intended to place the UK at the global forefront of ultra-low-carbon vehicle development, demonstration, manufacture and use)

4. A New Systemic Thinking of Heritage: a Common Space for Researchers and Cultural Actors

Iperion Ch: Integrated Platform for the European Research Infrastructure on Cultural Heritage

Ongoing Project,[13] *co-ordinated by the National Research Council of Italy (CNR)*

This project brings forward a deeply innovative integration of heritage-related research activities. In so doing, it transforms the previous boundaries between disciplines into a wider multidisciplinary scope, embracing all aspects of interpretation, conservation and restoration of material heritage.

By introducing a new and systemic approach to the study and significance of cultural heritage, the project combines a radical change in the way users will analyse heritage artefacts with new, practical applications in the field of museums, monuments and archaeological sites.

IPERION CH is an established consortium whose role is to fund a European network of research infrastructures dedicated to the study of cultural artefacts until 2019. Praised during the evaluation process for its scientific quality, this project has been selected by the European Commission in the framework of its Horizon 2020 Strategy. This project results from an in-depth dialogue between 23 partners from European Union Member States and from the United States.

In terms of impact, the project brings substantial innovation thanks to the sharing of advanced characterisation methods: large-scale facilities (synchrotron, neutron and ion beams), mobile laboratories, access to the scientific archives of the laboratories, and data analysis.

ASPECTS OF INNOVATION	
a) Interdisciplinary collaboration	Researchers and professionals from heritage science, cultural studies, diagnostics, experts in methodologies for exploitation and transfer of innovation to industry
b) Successful contribution of the humanities	Providing world-class scientific tools and knowledge to heritage scientists through the creation of integrated trans-national access platforms
c) Innovative ways of doing and organising working methods	Practices of collaborative interaction with the global heritage community, with special attention to SME competitiveness and growth, and to social and cultural innovation

d) Practical impact in new ways of acting within the cultural heritage sector community	Creating an extremely structured scientific community and innovative ways of reaching new communities of users. Organising periodic on-site training camps in selected locations, such as historical centres and sites, premises of large museums or graduate schools for conservation. Best practices and methodological approaches in heritage science using innovative mobile instruments are used to train new potential users, students and enterprises

5. Medical Humanities: a New Horizon for Ethical Challenges

Normastim: Research Addressing Fundamental Questions about the Human Being and Brain Function

NormaStim brings together a multidisciplinary team of 28 social sciences and humanities researchers, with the co-operation of deep brain stimulation (DBS) specialists; three partners well-known in the field of Law (UMR de droit comparé); Sociology, Anthropology and History of Health and Sciences (CERMES3); Philosophy and History of Care, Medicine and Neurosciences (SPHERE: CNRS–Université Paris Diderot)[14]

Emerging neuroscientific challenges have prompted a team of researchers from a variety of disciplines to work together on an innovative approach to very delicate care practices related to patients with neurodegenerative and neuropsychiatric diseases.

Bioethical issues are central to the research questions at the basis of this project, which deals with legal as well as philosophical and sociological issues in neurosciences, studied through a specific technology: deep brain stimulation (DBS).

DBS lies at the interface between experiment and daily clinic in the field of neurology and psychiatry. While DBS is a well-known therapy it remains a field of active research.

DBS is thus an interesting case for studying the links between clinical research and daily medical practice based on the understanding of care concepts and the way that social, human, medical and legal interventions connect and transform the discourse about responsibility and liability in complex healthcare contexts.

NormaStim addresses the problem of anticipating the future understanding of human development by exploring new ground-breaking potential of emerging research areas, on the border between

medical sciences and humanities where the multiple components of the essence of human life are investigated.

ASPECTS OF INNOVATION	
a) Interdisciplinary collaboration	Combination of disciplines looking both at brain function and at the essence of human beings from different angles (philosophical, clinical, etc.)
d) Practical impact in new ways of acting within the cultural heritage sector community	Innovative ways and methods of looking at the fundamental questions of human improvement and enhancement, involving different types of actors, including patients and experience-based analytics

The above overview of exemplar projects undertaken by humanities scholars shows how different mixes of innovative research patterns and actions are able to produce different forms and combinations of radical innovations. These represent the source of deep change in the ways the research questions are dealt with and, consequently, in the unpredictable outcomes that emerge in order to answer societal challenges.

All forms of innovation highlighted in the previous case studies are at the core of humanities approaches and trends in fostering a long-term perspective across the research landscape: from increasing interdisciplinary collaborations and stimulating research teams across the wide scientific spectrum, to pushing the boundaries of knowledge exchange within the humanities themselves. And from developing new methods of work to empirical humanities-driven initiatives, including ethical interventions with real-world impact in the way of thinking and acting.

All these forms of innovation are intrinsically radical as they deeply change the human approach to collective challenges, in the short- as well as in the long run, and they introduce new perspectives for tackling global challenges faced by our society.

Conclusions and Recommendations

For centuries Europe managed to sustain a rich research ecology that fostered innovation, much of which served to transform society and those systems in which human life was embedded. This research ecology had the humanities at its heart.

This Opinion Paper advocates and exemplifies the concept of radical innovation and its societal impact from the perspective of humanities research as a lever of deep change for a Europe faced by global challenges.

Therefore, managing and understanding the impact of radical innovation is essential in order to create new pathways to innovation and ensure both ethical and productive effects. Of key importance here are some fundamental definitions of innovation across the entire research ecology.

In particular, the Opinion Paper suggests that the following considerations and arguments are taken into account and embedded into innovation policy design:

- Europe is now being overtaken by other nations who seek to transform their cultures of reproduction through innovation-driven progress. They are doing this by bringing the humanities to the centre of technological and scientific developments.
- At the same time Europe's policies and funding programmes, in particular Horizon 2020, seem to be relegating the humanities to the peripheries of the research landscape.
- These developments have led to a research environment in which incremental developments have come to substitute for more radical forms of innovation.
- The challenges faced by contemporary societies will not be solved through incremental developments; rather they demand radically new approaches.
- As challenge-driven research comes to take priority over traditional forms of curiosity-based research this will stimulate a need to draw knowledge from across disciplines and so stimulate innovative approaches.
- The prevailing approach to innovation in Horizon 2020 reflects the legacy of traditional, curiosity-based research focused on the sciences and technologies. This generally sustains a prevailing culture of incremental development rather than integrating all research domains into a new ecology of radical innovation.
- When radical innovation does emerge it can be game-changing and can deliver impacts beyond the original challenge. In this respect the intended and unintended impacts on peoples and societies need to be managed and monitored within an ethical framework.
- Radical innovation is an essential element in translating research-led knowledge into real-world impacts that stimulate deep change.

Consequently, this Opinion Paper recommends the following actions and concrete measures to be undertaken by policy makers in charge of the innovation agenda in Europe:

- Policy makers have to take measures across the research ecosystem to support the integration of disciplines and stimulate a genuine interaction among all of them.

- A strong commitment towards the co-design of research questions and of their framing, between policy makers and scholars from the wide scientific spectrum, is needed in order to support research-driven innovation projects based on a common language and a shared vision of what innovation is.

- Emerging interdisciplinary areas of study, within the humanities themselves as well as those generated by the interaction between the humanities and the natural sciences, need to be deeply analysed and understood in order to address future societal challenges which are increasingly interdisciplinary in nature.

- National as well as trans-European research stakeholders need to nurture the establishment of innovation-focused programmes which support all aspects of innovation and which are also fertile for the development of non-linear and intangible innovation.

- The major challenge for Horizon 2020 is to create a new research ecology that is appropriate and coherent for the societal challenges faced by the 21st century. This will require explicit design and management of the programmes from the very beginning to ensure that a cohesive and integrated culture of innovation will emerge from a balanced and effective integration of all research disciplines.

The Science Europe Scientific Committee for the Humanities calls on all research actors to become involved in this process and to make an effective contribution to strengthening and promoting radical innovation in European research.

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