Research Policy 42 (2013) 220–230

Contents lists available at SciVerse ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Between the global and the national: Organising European science

Maria Nedeva *

Manchester Institute of Innovation Research (MIoIR), Manchester Business School (MBS), The University of Manchester, Oxford Rd., Harold Hankins Bld., Manchester M13 9PL, United Kingdom

ARTICLE INFO

Article history:
Received 12 April 2010
Received in revised form 25 May 2012
Accepted 10 July 2012
Available online 16 August 2012

Keywords:
Science dynamics
Science change
Science organisations
European Research Council
Knowledge community
Research space

ABSTRACT

Change in policy and organisation is often presented as solely the outcome of a combination of social and political processes. Furthermore, these processes are, somewhat misguidedly it is argued here, presented as explanations or 'reasons' rather than historically specific social mechanism through which core tensions are resolved. In counter-distinction, this paper seeks to explore both the generative mechanisms and the specific social conditions behind the process of science organisation building at European level. Extending the organisation of science to the European level, it is argued, results from continuous attempts to alleviate the tension between inherently global research fields and largely localised research spaces by extending the latter. How this tension is resolved is historically specific and depends on the combination of three sets of social conditions. Intellectually, this paper draws on, and contributes to, the fields of sociology of science, science and innovation studies and political science. Empirically, the discussion is informed by interviews, secondary data analysis and the analysis of the publications trail relating to the debate about the ERC between 2002 and 2004.

1. Introduction

Research funding and support organisation building at European level can be traced back almost to the very beginnings of European integration. As early as the 1950s the idea of establishing a pan-European funding agency in the image of the National Science Foundation in the United States was in the air. But, for the next couple of decades, European level organisations were established only in very specific science areas, namely nuclear research (CERN) and molecular biology (EMBO). During the 1970s and the 1980s organisations seeking to co-ordinate national research effort, such as COST, the ESF and Eureka were set up, and in the 1980s the Framework Programme (FP) largely supporting collaborative research at the more applied spectrum was established. Europe took half a century to establish a pan-European funding agency supporting investigator driven 'frontier' research.

The European Research Council (ERC) was established as part of a large scale programme for re-shaping the research funding and support for science at European level. Ideologically framed by the notion of the European Research Area (ERA) that set a policy agenda for '. . .overcoming the 'harmful' fragmentation science in Europe', and achieving a 'better organisation of the European research effort' being conditional upon the development of a European research space (system) that went 'beyond the current static structure of "15 + 1" towards a more dynamic configuration' (COM (2000) 6, p. 7), this programme also included other funding mechanisms such as ERANets (Brummer et al., 2008; Horvat et al., 2006), Technology Platforms, and Networks of Excellence (Breschi and Cusmano, 2004; Luukkonen et al., 2006).[1]

The process of organising science at the European level is detailed by historical accounts (Guzzetti, 1995; Morange, 1995; Krige, 2006). It is also discussed under the banner of 'Europeanisation' of research (Van der Meulen, 2002; Trondal, 2002; Olsen, 2002). Furthermore, the decision to set up a pan-European research-funding agency aiming to support investigator driven 'frontier' research based of scientific excellence can be interpreted in a number of ways. For instance, it has been discussed as part of the much broader objectives of the European Research Area (ERA) for further research integration (Nijkamp, 2003; Luukkonen, 2009). Similarly, it can be seen as contributing to the achievement of the Lisbon agenda for transforming the European Union into the "most competitive and dynamic knowledge-based economy in the world" (ERA News). As a desired outcome of a policy process, the ERC can be interpreted as an example of policy-initiated change (Boden et al., 2004). Alternatively, the story of the establishment of the ERC can be told through the content, structure and tensions in the European policy debate. These to a large degree shaped the organisation it is today (Gronbaek, 2003; Nedeva et al., 2003).

* Tel.: +44 161 2755921; fax: +44 161 2750923.
E-mail address: Maria.Nedeva@mbs.ac.uk

[1] Many of these instruments were later limited (Networks of Excellence) or modified (ERANets).

0048-7333/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.respol.2012.07.006

Discussions of the establishment of the ERC, and the research support organisation building at European level more generally, tend to focus on the social and political micro processes, or on the 'how', in preference to un-packing their generative mechanisms. It is indicative, for instance, that the two best known papers on the ERC include in their title statements such as 'idea whose time has come' and 'a point of no return' (Nijkamp, 2003; Gronbaek, 2003).

This paper, seeks to explore both the generative mechanisms and the specific conditions behind the process of science organisation building at European level. Developing science organisationally, and setting up research funding organisations at European level, it is argued, results from continuous attempts to alleviate the tension between inherently global research fields and largely localised, mainly nationally bound, research spaces. How this tension is alleviated is historically specific and depends on three sets of framework conditions, namely the 'change champion' organising and driving the change process, the 'change agent' negotiating and legitimising the change, and the level of commensurability of research spaces shaping the organisational space and providing the framework conditions for the negotiations between actors at different political levels of aggregation.

Correspondingly, the paper is organised in three parts; the first part is more conceptual in nature, the second part contains the empirical discussion and the third part is a critical discussion of the case through the expectations of the theory.

2. (Re)conceptualising Europeanisation

This paper draws on a clear distinction between causal powers or generative mechanisms and the specific conditions through which these manifest. Analyses of the 'Europeanisation' of science, including the establishment of the ERC, generally focus on the specific conditions rather than causal powers (Trondal, 2002; Banchoff, 2002; Van der Wende, 1997). Here, the Europeanisation of science is (re)conceptualised by drawing on a notion of science dynamics as a relationship between research fields and research spaces and linking this to three reference points for discussing the specific conditions for change and organisation building.

2.1. Science as a relationship between 'research fields' and 'research spaces'

Conceptualisations of science and its dynamics mostly focus on the relationships between science and considerations for its use (Stokes, 1997), its orientation towards external goals (Böhme et al., 1983) or the links between the social and cognitive aspects of science (Whitley, 2000; Shinn, 1999). Attempts to bridge the lacuna between the social and the cognitive organisation of science offer considerable opportunities for the analysis and, in particular, cognitive dynamics. However, in terms of explicating the causal power(s) behind the processes of science organising, these concepts present two problems. First, these notions generally focus on the effects of social conditions on cognitive dynamics rather than on un-packing the social mechanisms of organisational change. And second, they generally take more institutionalist stand and do not address the organisational architectonic of science explicitly.

In this paper the continuous organisation building at European level, including the establishment of the ERC, is discussed in the context of a notion of science as a relationship between 'research fields' and 'research spaces' (Nedeva, 2010). 'Research fields' are empirically outlined by three inter-connected elements, namely relatively converging *knowledge communities*, coherent *bodies of knowledge* and *research organisations*. In this context, knowledge communities are defined as '. . .groups of researchers who share similar or commensurate epistemic assumptions, methodologies and have developed consistent systems of reputational control.' (Nedeva, 2010). Members of specific knowledge communities, by the virtue of sharing fundamental assumptions, methodologies and techniques, and rules and scripts, are involved in intensive interactions founded upon the exchange of information (Crane, 1972), knowledge flows (Knorr-Cetina, 1999) and reputational hierarchies. Hence, knowledge communities can be empirically accessed as relatively persistent social networks.

Research organisations are the lynchpin between 'research spaces' and 'research fields' in that on the one hand organisations are the legal unit of resource in science and, on the other, they enable researchers and scholars to be effective knowledge producer and participants in trans-organisational and trans-national knowledge communities.

'Research spaces' are defined by the 'essential' relationships of the research organisations and by notions of utility of knowledge. To the extent to which research organisations cannot function without resources, relationships between them and other organisations involving the exchange of money and people for knowledge are arguably 'essential'. Resources can, and indeed are, exchanged for knowledge embodied in science artefacts (academic paper, books, research reports, data sets, equipment and facilities, techniques, new molecules etc.) and/or knowledge embodied in people (competencies).

In a nutshell, research spaces are funding and policy environments within which the rules of knowledge production, knowledge legitimacy and knowledge use are negotiated. Fig. 1 is a graphical representation of the notion of science as a relationship between 'research fields' and 'research spaces'.

The conceptualisation of science as a relationship between 'research fields' and 'research spaces' has a number of implications for the study of science dynamics; discussing these here in any detail is likely to obscure the argument rather than contribute to it. This notion, however, brings attention back to organisations and by according similar status to the social and cognitive aspects of science[2] opens the (symmetrical) relationship between them to analysis.

A number of tensions between different aspects of science, understood as a relationship between 'research fields' and 'research spaces', can be identified. One such tension, for instance, is the tension between knowledge communities and research organisations resulting from these having developed different reward, control and evaluation systems. Another tension that potentially could have important consequences for policy and policymaking is this between highly differentiated research fields (e.g. Life Sciences, Financial Mathematics, Education etc.) and the usually non-differentiated research spaces (blanket policies). Yet another tension, one particularly relevant for the understanding of the processes of organising science at European level, is the tension between the inherently global nature of the research fields and the localised, mostly national, research spaces. This tension is discussed in some detail in the next section of the paper.

2.2. Global "research fields" and localised "research spaces": the tension

Research fields are, and have always been, inherently 'open' and global.[3] Science deals with problems that are mostly

[2] This means that in the context of this notion the social and cognitive conditions of science are not framed as 'independent' and 'dependent variables; there is an underlying assumption of symmetrical relationships.

[3] This statement obviously excludes special cases such as commercial and military science. Whilst the commercial and military science can be carried out in international collaboration the use of knowledge is subject to variety of restrictions.

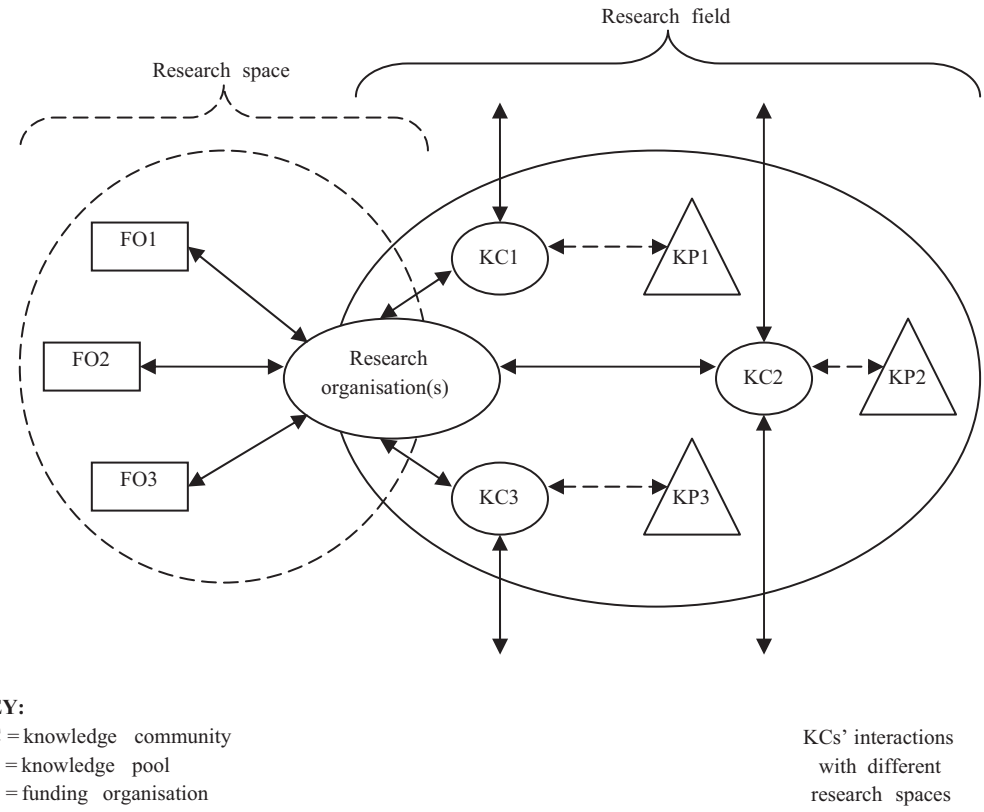

Fig. 1. Relationship between research fields and research spaces.

universal, trans-national knowledge communities collaborate, directly or not, to solve these problems and the solutions feed into universally accessible[4] knowledge commons (Merton, 1973). Markers for the global nature of the research fields are offered by the increased level of international collaboration in research, cross-country co-publishing and citations, the proliferation of international research associations, international conferences, international journals and international facilities and organisations.

Meanwhile, the research spaces are mostly grounded in national contexts. This is because resources for science and the rules for their exchange are specific to national contexts. National research spaces vary according to how science is discursively framed; the relationships between public funders and science as expressed by level of funding; funding modalities and funding intermediaries; and the nature of research institutions and organisations (Nedeva and Boden, 2006).

National research spaces differ greatly according to the relationships between public funders and science. More specifically, these differences can be registered empirically in four aspects. First, the level of financial support for science, research and innovation can vary dramatically. Second, funding can be allocated as block grants to large organisations, project support by funding agencies or some combination of the two. Third, there are differences in terms of the organisational set up for funding research. And fourth, national research spaces vary according to the accountability and evaluation systems these have developed to inform research funding decisions (Whitley and Glaser, 2007). These differences produce variance in terms of research organisations, national career structures and individual career paths.

There is a tension between the inherently global character of research fields and the largely national nature of research spaces whereby the latter can restrict the further growth and development of the former. This tension is particularly apparent in the case of knowledge communities and research organisations. Knowledge communities are likely to be restricted in their further development by the national spaces in a three important ways. First, the opportunities open to members of the knowledge communities for carrying out collaborative, co-ordinated or joint research programmes and projects can be rather restricted. Second, knowledge and infrastructure complementarities can be difficult to realise. And third, because of the differences between national research spaces discussed above, transnational (global) knowledge communities would tend to fragment and/or be dominated by members from particular national contexts. Research organisations, on the other hand, experience this tension as a contradiction between the national rules of funding, accountability and evaluation, the universal rules and criteria of knowledge and the global strive of their researchers and scholars.

This tension between global research fields and local research spaces can be resolved in two principal ways. One would involve restricting the global character of the research fields, which apart from difficult to implement is likely to affect the very nature of science and scientific knowledge.[5] The other, would demand the extension of the research space(s) beyond national boundaries.

2.3. Expanding research space(s) as a social process

Whilst the inherent contradiction between global research fields and localised research spaces is, it is argued here, the

[4] Even the possibility to build a nuclear bomb was published and accessible to all (see Perutz, 1998).

[5] There have been political attempts to do that throughout history and the development of science in the former USSR can provide an example here.

generative mechanism behind the continuous attempts to expand the latter, this itself occurs, or not, as an outcome of a set of complex social processes (Edler, 2003). It is important to note that a number of conditions, ascribed to both research fields and research spaces, shape the specific process(s) of organisation building and its outcome(s). Furthermore, the combination between the different conditions, it is argued here, provide the limits to the extension and to a degree determine the historically specific way(s) in which the tension is alleviated. Here, these conditions are discussed as falling under three broad groups that, we posit, capture the axes that may generate different outcomes.

First and foremost, organisation building as a process of extension of the localised research spaces is not likely to occur if there is no 'change champion'. The 'change champion' is the social group (or groups) that not only conceives and carries the initial idea but also has a necessary level of influence, in knowledge communities, research organisations and policy circles to promote, drive and mobilise support for the change process. In the specific case of extending research spaces the 'change champion' may be the international elite of one or more knowledge communities, political elites or industrial actors. It is reasonable to expect that the change champion is a social actor particularly constrained by the localised research spaces. Furthermore, it is likely that there will already be some experience of international organisation building, wider influence and some authority in the relationship(s) with political actors. The primary aim of the 'change champion' is to achieve consensus through building alliances and moderating and influencing public debates, and to get its preferred option on the agenda of the relevant policy actors.[6]

Second, at least some level of institutionalisation at the level of the expansion is necessary. This level of institutionalisation (and organisation building) also outlines the limitations of the intended expansion. In other words, if some institutions and organisations at European level did not already exist, expanding national research spaces may occur but this is unlikely.[7] Furthermore, any formal expansion of national research spaces demands a political actor(s) that is structurally and functionally in a position to negotiate and decide upon the expansion. This actor, or 'change agent' legitimises the change and anchors it into pre-existing structures and routines. Naturally, the 'change agent' ought to be at least sympathetic to the cause of the 'change champion' although not necessarily sharing their rationale and reasoning.

And third, the specific way in which the tension between global research fields and local research spaces is alleviated to a degree depends on two factors associated with the national spaces. These are the extent to which national research spaces are commensurate since this outlines the specific organisational space within which the extension occurs and, related to that, the degree of support or opposition of different national organisational actors.[8]

Whether national research spaces are commensurate or not depends on three of their characteristics, namely funding rules, organisational set-up for funding and organisational-set up for research. In terms of commensurability of funding rules the main distinction is the one between rules for allocating predominantly undifferentiated block grants to large organisations and predominantly project based support to principle investigators and research teams. Where the organisational set-up for science and research funding is concerned the distinction between the type of intermediary, namely research council or equivalent or a large research organisation, is important. And last but not least, historically, two framework organisational models for conducting research have emerged; one where research is carried out predominantly within universities or the other one where public research organisations are the dominant site for research work.

All three groups of conditions play when a process of extending research space(s) takes place. The form of organising resulting from the process depends on the combination of these conditions. In the next section of this paper, this is illustrated by a more detailed discussion of the process of expanding national research spaces at the European level.

3. Expanding the national research space(s) at the European level

In this section of the paper the historically specific processes of extending national research spaces at the European level are set out in chronological order. These began in the aftermath of the Second World War, when in the words of an interviewee '. . .the scientific community at large had been decimated by the war, especially the Jewish scientists' and '. . .Europe had to get going to regenerate. . .'. Setting up the ERC is only the latest of a string of expansions that, although caused by the same tension, have been shaped by somewhat different social conditions.

The story of the continuous expansion of the national research spaces at European level was constructed by using secondary data, tracing debates by looking at specialised publications and the ways in which these were presented by media and interviews with key participants. Thus the story of the establishment of the ERC is less schematic than the earlier histories by the virtue of time and much broader and public debate.

3.1. Early organisation building at European level

Historically, the process of expanding the research space(s) in Europe can be traced back to the aftermath of World War II. During the 1950s, science and research organisation building at European level proceeded under the shadow of the European Community institution building. This was the time of the first steps towards the establishment of an internal free market (Kapteyn, 1996) and of '. . .building common policies in a few related economic sectors. . .' (Gronbaek, 2003, p. 393).

As early as the 1950s, the scientific elites of some knowledge communities were already exerting pressure for the expansion of the national research spaces. They promoted the establishment of a pan-European funding organisation to support fundamental research and work on principles similar to these of the National Science Foundation in the USA (Darmon, 1995). This was largely an attempt to import science organisation structures from the USA with little regard for the local context. At the time, the process of organisation building at European level was restricted because of the generally under-developed European institutions, the insistence on national autonomy (Kapteyn, 1996) including the accelerated building and stabilisation of national research spaces, the low level of commensurability of national research spaces and broader factors such as the low level of market, including labour market(s), integration. Whilst Europe set out to create a 'stateless market' (Kapteyn, 1996) 'stateless science' was too much to consider at the time.

Instead, for the next couple of decades, European level organisations emerged in two very specific areas, namely nuclear research and molecular biology. Thus, in 1952 CERN, The

[6] In terminology closer to this of Marx, were these kind of processes to be seen as 'revolution' the role and functions of the changing champion would be very similar to these of the 'revolutionary power' which is different in the case of different societal transitions.

[7] Or this will be accompanied by and precipitate political organising at that level.

[8] When the national research spaces are too different in their rules and organising of funding and research it is politically difficult to promote very specific arrangements at transnational level. This probably can go some way towards accounting for the existence of the ESF: an organisation having little focus, funding and authority.

European Organisation for Nuclear Research, was established as an inter-governmental organisation followed in 1957 by EURATOM, which marked an important point in the building of the European Communities (Guzzetti, 1995). CERN was championed by an elite group of European physicists who procured the support of their national governments. It is not coincidence that the first European science organisation was in a research field that is explicitly global and demands large-scale co-operation, expensive equipment and the establishment of international standards for use and safety. Furthermore, nuclear physics at the time was a field that was sufficiently internationalised[9] and characterised by intense competition with the US.

Slightly over a decade later, the European Molecular Biology Organisation (EMBO) was set up in 1964, followed in 1974 by the establishment of a pan-European laboratory (EMBL) (Morange, 1995). Here two somewhat different accounts of the establishment of EMBO exist. Michel Morange presents the establishment of EMBO as an attempt to improve Europe's competitive position in the field of molecular biology and associates the initiative with Nobel Prize winner John Kendrew (Morange, 1995). Max Perutz ascribes the idea for the establishment of the EMBO to Leo Szilard, a physicist who was also instrumental for setting up the Manhattan Project. Szilard realised the great advantages CERN brought to the physicists in Europe and suggested that an organisation along similar lines can provide a stimulus to the molecular biologists (Perutz, 1998). The idea was adopted by the top molecular biologists in Europe who engendered the support of the Volkswagen foundation and established EMBO as an international science academy supporting fellowships and workshops.

Generally, this initial period of European organisation building is characterised by powerful, organised elites in few isolated research fields who exerted influence at national level. These elites acted as 'change champions' for the cause of European organisation building. There was no 'change agent' because of the embryonic level of development of European institutions and organisations generally and national level support was fragmented. Thus, a limited number of European organisations, operating in specific domains and with limited remit emerged during this period.

The 1970s witnessed the establishment of what Gronbaek refers to as 'diffuse' organisations (Gronbaek, 2003). These include the European Co-operation in Scientific and Technical Research (COST) established in 1971 and the European Science Foundation (ESF) set up in 1974. These organisations are different from the ones discussed above in that they cover the whole spectrum of research, including the social sciences. At the same time both organisations were designed to provide platforms for cross-national co-operation rather than to support science at European level. As a consequence, they either support only international meetings or, as in the case of the ESF, do not have funds as such but co-ordinate national research programmes by organising international peer review.

In parallel, different European Community research programmes continued to exist and/or to emerge. As Guzzetti points out however '...Great disorder reigned in Community research affairs at the beginning of the 1980s...' (Guzzetti, 1995, p. 83) and there was no European policy on science and technology. Governments were still jealously guarding their sovereignty and were opposed to any further extension of the role of the Community in science and technology. Hence, all programmes had to be approved separately and unanimously by the Council of the European Parliament. A way to offset this was the establishment, in 1983, of the Framework Programme, which brought under the same heading all research programmes in technological fields.

The impetus for these developments was provided by two sources: industry and the maturing European political elite. National support, however, stayed relatively low which was expressed in the co-ordination type organisations on the one hand and in the adopted principles of subsidiarity, on the other.

This broad-brush historical overview of science and research organisation building in Europe during the latter fifty years of twentieth century evidences continuous attempts to expand the national research space(s). The expansion, however, consisted of organisations (facilities) in specific research areas, platforms for co-ordinating national effort or funding mechanisms supporting the applied and development segment of the research spectrum. Thus, by the end of the twentieth century, the continuous attempts to expand the research space(s) in Europe produced a science support system that that at best provided temporary and partial solution to the tension between global research fields and local research spaces. These organisational developments, however, prepared the conditions for the realisation of an old dream of the scientists; the establishment of a pan-European funding agency to support investigator driven, path-breaking science and research and in charge of generous budget. This organisation is the European Research Council (ERC).

3.2. European Research Council: events, debates and framework developments

This part of the paper tells the story around the establishment of the ERC focusing on the events, debates and framework conditions in the period between 2002 and 2004. Our study starts in 2002 when the movement (and debate) properly gathered momentum following a conference organised and hosted by the Danish Research Councils and entitled 'Towards a European Research Area: Do We Need a European Research Council?'. Our story finishes at the end of 2004 by which time it was decided to include the IDEAS Programme and the ERC – as the body that implements it – in the official proposal for the EU's Seventh Framework Programme. This proposal was adopted in April 2005 and marked the shift of the debate from whether to establish an ERC to its missions, functions and governance.

Constructing histories involves necessary tradeoffs between detail and narrative. Here, we have chosen to offer a stylised story of the establishment of the ERC framed by a number of sequential official events (in the broad sense of the word) and debates as glimpsed through official documents, press articles and interviews.

3.2.1. Chronology of events and debates

Our interviewees placed the beginning of the politicking about the establishment of the ERC roughly in mid-1990s but events and debates are difficult to trace. Discussions were informal and took the form of general discontent with the research effort at European level; hence, recollection is questionable and histories dubious. However, interviewees singled out the early involvement of, the then Director General of the EMBL, Prof. Fotis Kafatos, and of Jose Mariano Gago – a physicist turned politician. Furthermore, an informal meeting that took place around 2000–2001 was hosted by the Royal Swedish Academy; this proved instrumental for the later developments. About ten people (biologists, physicists and some politicians[10]) were invited and the discussion focused on whether Europe should devote more effort to research. There was consensus that Europe is not doing enough but also that Europe is working from misguided notions and in the wrong direction. At the time scientists went with the political 'mantra' that 'Europe

[9] This internationalisation was partly achieved through the displacement and relocation of elite physicists during the Second World War.

[10] Since the meeting was informal and official records of it were hard to come by confidentiality is essential.

is excellent in science but not good in application'; at this meeting it was openly acknowledged that Europe is lagging behind in both.

The next event in the story, and indeed the systematic beginning of it, took place in October 2002; the Danish Research Councils organised and hosted a conference entitled 'Towards a European Research Area: Do We Need a European Research Council?'. The purpose of the conference was to discuss whether, and under what conditions, setting up a European Research Council could add value to the European Research Area (The Danish Research Councils, 2002). The conference attracted around 200 participants from national agencies for basic research, European-level research organisations, national governments and the European Commission and ensured representation from 29 EU, candidate and other European countries. Participants in the conference report that, because of the preceding informal organising events, at this conference there was already a group of scientists who had the conviction to state clearly the Europe ought to build its science capacity at European level instead of misguidedly believing that supporting application is sufficient. Despite some dissenting voices there was an overall consensus regarding the necessity for and timeliness of the establishing of an ERC.

Following that, in November 2002, the European Council of Ministers invited the Member states and the Commission to continue discussions on the purpose and scope of an ERC. At the end of the same year the Danish Minister for Science, Technology and Innovation initiated a small expert group the prime responsibility of which is to explore options for the eventual setting up of an ERC (ERCEG). This group consisted of eight members including an observer from the European Commission. It was chaired by Professor Federico Mayor, former Director-General of UNESCO and reported at the end of 2003. Their report was presented to the EU research ministers.

The next official stepping stone in the process of negotiating and establishing the ERC was the Paris meeting in February 2003. This was organised and sponsored by the European Life Sciences Forum (ELSF), and supported by the European Molecular Biology Organisation (EMBO), the Federation of Biochemical Societies (FEBS) and the UNESCO Division of Basic and Engineering Sciences. It provided a platform for over 300 leading life scientists and policy makers including three Nobel Prize Laureates. Prof. John Sulston, for instance, argued the need for developing and supporting European level science infrastructure and even mentioned the 'f' word, that '. . .Europe needs the concept of federal focus in its science. . .' (Van Dyck and Peereboom, 2003).

Soon after this meeting, evidence that what started as the initiative of a single research field has spread started to accumulate. So, in October 2003 an open letter in support of the establishment of an ERC signed by 45 European Nobel Laureates was presented to the then European Commissioner for Research Philippe Busquin. It is also indicative that 52 European scientific organisations in all research fields co-signed a letter launched by the Initiative for Science in Europe[11] and published in Science magazine on August 6, 2004. The letter clearly stated that '. . .The enlarged EU, a newly elected European Parliament, and a new Commission should now grasp the historic opportunity to establish without delay a European Research Council (ERC). . .' (Science, 2004, p. 776). This appeal also emphasised the importance of the continued '. . .involvement of the European scientific community in the organisation of an ERC and the need to adhere to strict criteria of scientific excellence.' (EurekAlert, August 6, 2004)

[11] This organisation was established with the explicit aim to coordinate the drive for further organisation of science at European level and officially launched in 2004.

It is also interesting that at the Paris conference (2003) the EC offered only lukewarm support to the move towards ERC. There, Peter Kind outlines conditions regarding duplication and 'added value', which among other things is indicative of the Commission still viewing science as a broadly national endeavour, and suggested that EUROHORCs or the European Science Foundation could be the founders of the ERC. According to some, at the same meeting, Philippe Busquin avoided even using the term ERC in his concluding remarks. More forgiving accounts tell of broad support for the idea of ERC, clear statement that the EC is not the appropriate body to set it up, and that any such organisation will in all likelihood need to be funded by the national Research Councils.

Within a year a dramatic change in the attitude and intentions of the Commission had occurred. This was signalled at the Dublin Conference (February 2004) by A. Mitsos, at the time Director-General of the EC's Research DG, who stated very strong support for the funding of basic science at European level and related this to the idea of an ERC. In October of the same year, at the second Paris conference, Mitsos went a step further and emerged as a passionate supporter and a stout defender of the ERC, of its autonomy and its suggested scope. In an interview for the Times Higher Education he argued the ERC's need for autonomy from the EC and pledged that he 'is not going to give an inch on autonomy'. He pointed out that the '. . .discussion is not basic vs. applied research. The discussion is policy-driven vs. science driven decisions.' (THE, 2004)

This dramatic, and some may argue fortuitous, change of the position of the European Commission, is attributed by interviewees to a re-framing of the notion of the European added value in research from, as Stampfer (2008) usefully summarised, subsidiarity, additionality and complementarity, to competition.

Traditionally, European policy was shaped by the 'principle of subsidiarity' (re-affirmed in 1992 by the Treaty of Maastricht) stating that the EU could act only in cases where action by individual countries was insufficient. In the context of science and research this translated into an objective for 'strengthening the scientific and technological bases of Community industry' and the call that this should be implemented through promoting co-operation. This led to an organisation of science and research at European level that 'might have reflected not only a belief in the effectiveness of selective R&D policies but also a desire to put bounds to integration at the discretion of the Commission' (Gronbaek, 2003, p. 394). During the months preceding the Dublin Conference, the notion of European added value in research was re-framed as follows:

> 'Until now European added value has been defined as the collaboration of research teams in different countries. It is now time to bring a new definition of added value, on that incorporates the principle of allowing a researcher in any European state to compete with all other researchers on the basis of excellence. Competition in order to achieve real excellence in research should become an essential part of a new, forward looking definition of European added value' (ERCEG, 2003, p. 4).

This is informally attributed to A. Mitsos who is also praised by participants in the process as 'a great reformer' and 'a man with the vision to revolutionise European research policy'.

In addition, by the beginning of this century, all national research spaces in Europe had undergone rather profound changes converging on the alignment of their funding rules, funding organisations and research performing actors. First, although there are still differences in terms of the framework funding rules an overall shift towards project rather than block grant funding for science and research can be observed (Lepori et al., 2007). Second, all EU member countries have either changed, or made moves towards changing, their organisational set-up for funding science and research. Currently, among the old EU member states only

Italy and Spain do not have a dedicated agency funding science on project basis,[12] and such agency is highly likely to be established in Spain in the near future.[13] And third, the place of the universities and role they play in national environments has been changing as well. Whilst the organisational differences of the universities in Europe cannot be underplayed it is probably more important that universities everywhere have been re-cast as the major research player in public science systems (Jacob et al., 2003; Marginson and Considine, 2000; Martin and Etzkowitz, 2000; Nedeva, 2008; Deem et al., 2007). Indeed, in many countries, such as France, Germany and Spain, for example, the universities have either recently usurped this position that traditionally belonged to large research organisations, or are in the process of doing so (Paradeise et al., 2009).

3.2.2. Chronology of support and opposition

The decision by the EC to propose the establishment of the ERC was preceded not only by 'negotiation' but also by a wide consultation involving European and national level actors. This part of the story is by its very nature harder to detail but it can be glimpsed through the official documents and recollections of participants: both in media and research interviews. Here, the positions of variety of actors have been structured by level of aggregation, namely researchers and scholars, research organisations and learned academies and national funding agencies and political actors.

Two European-wide consultations with *researchers*, one conducted by the ESF and another led by Euroscience, confirmed an overall support of the idea for the creation of an ERC. However, the researchers of Europe also expressed two serious concerns, namely that the ERC may become 'just another layer of bureaucracy' and second, that money may be re-directed from well-established and experienced national research councils to a unknown and possibly bureaucratic and politically affected European funding organisation (Sgard, 2004). These concerns were part of the debate in countries with long standing, transparent, efficient and peer review based research council funding systems.

An example in this respect is provided by the shape of debate in the United Kingdom, where scientists feared that their mature and established system will be diluted by the creation of a research council at European level (O'Neill, 2004). Evidence is provided by a fairly robust report prepared by the House of Commons (House of Commons, 2003a).

There is fairly limited evidence in the literature at the time about the position adopted by the *research organisations and learned academies* towards the establishment of an ERC. To the extent to which this can be traced, through the official statements and actions of their executives, it appears to have been positive with very few exceptions. Thus, Bernard Larrouturou, director general of the National Centre for Scientific Research (CNRS) in Paris at the time, was one of the overt and active supporters of the establishment of an ERC (O'Neill, 2004). Peter Gruss, professor of molecular cell biology at the University of Gottingen and president of the Max Planck Society in Munich, Germany, noted that to achieve science excellence in Europe to match the high standard in the US and stated that the establishment of '. . .a European Research Council seems to be the most adequate institutional response. . .' (Gruss, 2004).

Here again the best-documented opposition to the establishment of the ERC came from the Royal Society of London. On the 15 January 2004 the Royal Society published a working paper which deemed the creation of a European funding agency 'premature'. This paper voiced concerns that creating an ERC will mean a levy on national funding for research and the corresponding absolving of responsibility to Europe. There was also a warning against diverting attention from innovation and developing innovative capacity to basic research (Royal Society, 2004a).

In a follow on policy document prepared in response to the Mayor report the Royal Society reconsidered its position. Whilst enthusiastic about the establishment of a European Fund for Research Excellence from central EU resources, it offered only lukewarm support to the ERC. This document states that the ERC '. . .should, at least initially, have a more limited role than some would associate with a research council'. Furthermore, it was recommended that the ERC should focus on supporting the highest quality post-doctoral researchers in Europe (Royal Society, 2004b).

The position of the *national funding agencies* on the establishment of the ERC is probably best reflected in the position paper of the European Union Research Organisations Heads of Research Councils (EUROHORCs).[14] By May 2003, EUROHORCs had decided to support the establishment of an ERC (Anon., 2003) and by July 2004 have worked out and proposed the key principles for its foundation (EUROHORCs, 2004). Supportive of the idea to establish an ERC, EUROHORCs insisted that it ought to support investigator initiated research with the goal for advancing knowledge and understanding, cover all fields of research, be autonomous from the European Commission and government authorities and enhancement of the excellence of science through competition and peer review (EUROHORCs, 2004). These principles also provided the boundary conditions within which the moves to establish a pan-European basics research funding agency at European level would have been, and were, supported by the EUROHORCs.

Here again the position of the UK research councils was somewhat ambivalent. In 2003 Research Councils UK[15] was neither for nor against the possible establishment of the ERC, but they wished to be part of the debate. Concerns were expressed regarding the possibility of an ERC to become another European bureaucracy, the mechanisms for its funding and the level for priority setting in research. All these concerns hardly masked the fear of loss of national autonomy and influence in national research spaces. In fact, the UK research councils suggested that the co-ordination model is still best suited and that '. . .research councils are already pursuing interests in ERA-Net activity as a means of developing greater co-operation and integration between research funders in Europe.' (House of Commons, 2003a,b, p. 50).

Our interviewees reported that on the background of univocal support for the ERC from the Nordic countries[16] and the Netherlands,[17] there was early opposition at the level of national policy. This was particularly notable in the case of Germany, the UK and Italy. Reputedly, at the beginning of the process the German position was that the establishment of an ERC is against the subsidiarity principle and as such 'impossible'. Reframing the European added value in terms of competition dealt successfully with

[12] Dedicated research funding agencies were recently set up in France and Poland and in both cases the establishment of the ERC was used to support this change.

[13] An agency dedicated to funding basic science on project basis still has not been established in Spain which some observers attribute to the economic recession.

[14] EUROHORCs brings together the major publicly funded research organisations in the countries of the European Union and the Heads of national Research Councils. Membership is limited to six organisations per country and is only at senior executive level. Interestingly enough during 2004 Professor Ernst-Ludwig Winnacker, President of DFG, was the president of EUROHORCs. Professor Winnacker became the first Secretary General of the newly established ERC in 2007.

[15] Research Councils UK is a strategic partnership between the UK research councils. It was established in 2002 to enable them to work more effectively together.

[16] Sweden and Denmark were certainly ardent supporters of the idea but Finland was rather ambivalent at first.

[17] As early as the end of 2003, for instance, it was announced that the Netherlands would propose an ERC during their presidency of the European Council (the second half of 2004).

Table 1
Organisation building at European level.

	Change champion	Change agent	Commensurability of national research spaces
CERN	European Physic's elite returning from the US	National governments (European level low)	Very low
EMBO/EMBL	Molecular biologists; degree of isomorphism	National governments (European level low)	Very low
ESF, COST	National organisations (research and funding) National broad scholarly elites	Nationally based	Low
Framework Programme	Industry and maturing European political elite	Medium	Low
ERC	Life scientists; Organised scientific elite	EC	High (notable exceptions)

this and similar concerns. The position of the UK and Italy is more interesting.

The political elite of Italy was openly sceptical about the establishment of an ERC. The Italian Government expressed through the Ministry for Education, Universities and Research serious concerns relating to the proposal that the ERC funds PI based projects. This, it was argued, would encroach on the territory of the national funding bodies. Furthermore, it was suggested that Italy might be a net loser from such development since in '. . .a competition open to national teams, countries that are at the forefront of scientific and technological progress will pump resources from the least favoured.' (Tenenbaum, 2004). Similarly, the establishment in Spain belonged to the group '. . .of people [who] do not feel happy about it [the ERC]' (Banda, 2002). Interestingly, this debate precipitated calls for transforming the research funding system of Spain to provide the flexibility and comparability necessary to participate successfully in the ERC (Guinovart, 2004).

The UK also initially opposed the establishment of an ERC. According to a report by the UK House of Commons Science and Technology Committee[18] 'the UK Government retains an "open mind" on the subject [of the ERC]' (House of Commons, 2003a,b). The Committee, however, recommended that instead of creating a 'new bureaucracy' e.g. an ERC, the EC should aim to design a FP7 '. . .with the goal of 50:50 ratio of applied and basic research funding.' (House of Commons, 2003a,b, p. 53) In their response, the UK Government supported the recommendations of the Committee (House of Commons, 2003b).

Generally, the position in the UK was '. . .that science in the UK is not yet well-funded enough to say we would rather do this [the ERC] instead of the things that we're already trying to get done in the UK scene.' (O'Neill, 2004). One of the UK contributions to the debate on the ERC, just like in other instances, was to add equal doses of healthy scepticism and pragmatism. John Taylor, for instance, who in 2003 was the Director General of Research Councils UK and in this capacity was the British member of the Mayor's Panel confessed that his '. . .major input into the whole thing has been to get them to "get real" instead of just philosophising. . .' (O'Neill, 2004). Bob May, former Chief Scientific advisor, on the other hand stated '. . .I'm basically in favour of this European Research Council. . .provided it can be set up properly, which is by no means certain.' (O'Neill, 2004).

Serendipity played a great role for the change of British position regarding the ERC in 2004. The brief prepared for Lord Sainsbury, British Science Minister at the time, was negative. On his way to an informal discussion meeting on establishing a ERC Lord Sainsbury in his own words '. . .rather arbitrarily changed British policy: I gave a speech in which I outlined all the things that were wrong with the ERC – because by that stage it was too late to re-write the speech – but then explained that I would support it.' (BBC News, 2007).

Fig. 2 presents graphically the timeline of the events, debates and framework conditions presented in this part of the paper.

4. Discussion

In the previous parts of this paper we: (a) (re)conceptualised the process of organising science at European level as a result of two sets of factors, an inherent contradiction between global research fields and localised research spaces and historically specific conditions shaping organisational outcomes; and (b) traced the story of Europeanisation of science support and policy since the aftermath of World War II illustrating that whilst the process of organisation building persisted the organisations that were established and institutionalised varied substantively depending on a set of historically specific conditions. An overview of different combinations of the three groups of conditions set out elsewhere in this paper and how these relate to organisational outcomes is provided by Table 1.

In this part of the paper we interrogate the historical case through some expectations following from the (re)conceptualisation.

One expectation immediately linked to interpreting European level science support and policy organisation building as a string of attempts to alleviate the inherent tension between localises, in this case national, research spaces and global research fields would be that the driving force behind the process is a scientific elite, or elites. Furthermore, these elites would perceive themselves as particularly restricted by the national research space(s) and have the level of influence to act upon this perception.

Looking at Table 1, one notable exception is the FP which was championed by industry and the maturing European political elites; all other organisations were championed by scientific and scholarly elites. Throughout the story of expansion of national research spaces at European level the life scientists play significant role. Their role, however, is somewhat different in terms of the establishment of EMBO/EMBL and the ERC. In the case of the former, the life scientists acted as 'independent' scientific elite; in the case of the latter they used their experience and influence to organise the European scientific elite.

It should not come as a surprise that the life scientists were the initial driving force for organising the European scientific elite: they were the group that felt particularly restricted, had some experience of Europeanisation and had the influence to bring on board others and influence political will. This field is inherently international, relies on state-of-the-art equipment and laboratories which are as a rule concentrated at particular locations. Access to these laboratories is crucial for success of the field, both individual and collective, as is the free movement of researchers – which among other things required compatibility of carrier paths and reward, and promotions scripts. In addition, the field of life sciences has considerable authority with other academic fields and with political

[18] The Science and Technology Committee was appointed by the House of Commons to examine the expenditure, administration and policy of the Office of Science and Technology and its associated public bodies.

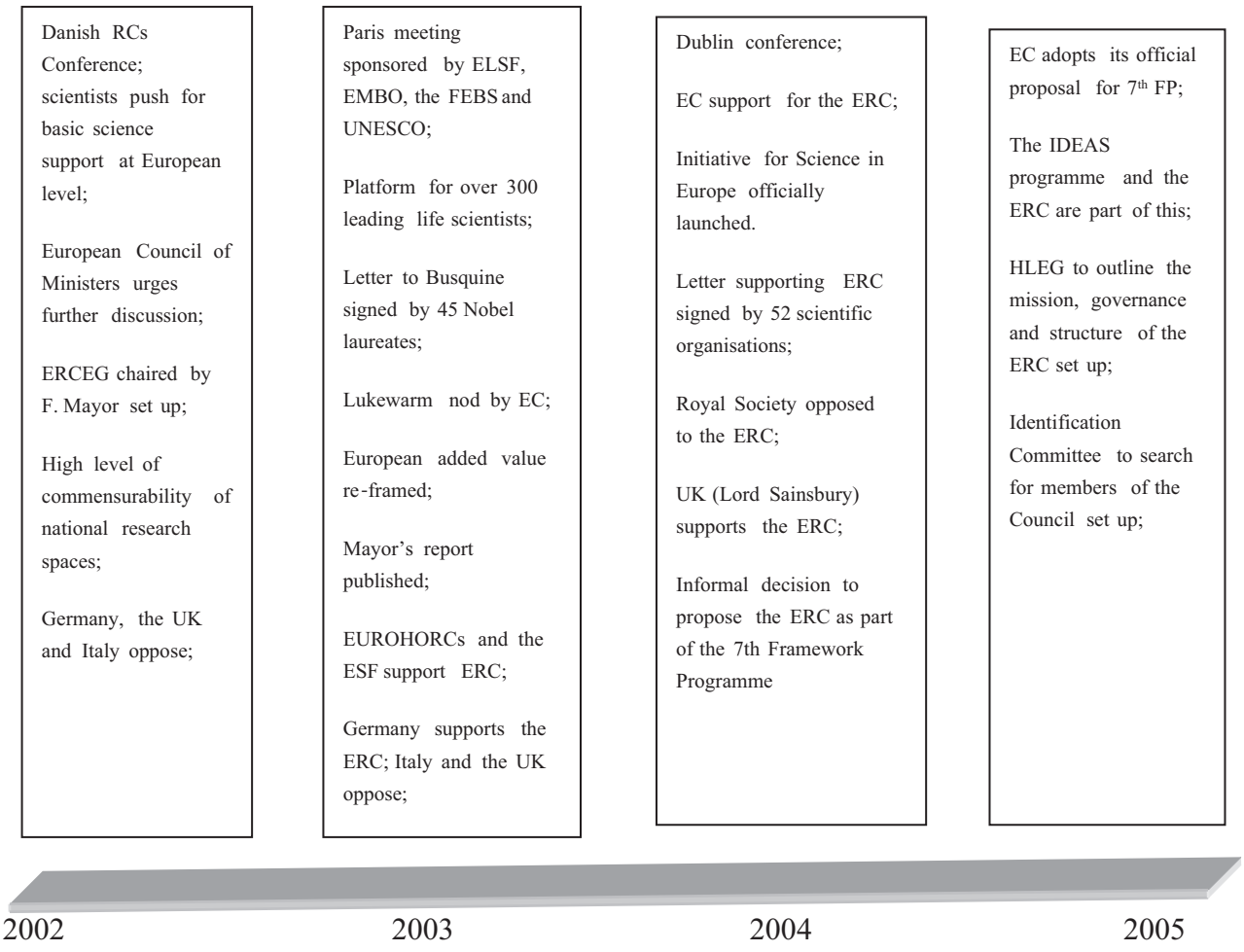

Fig. 2. Timeline of conditions for the establishment of the ERC.

actors at different levels to be able to build effective coalitions and exert the necessary pressure for driving organisation building. Finally, this field had considerable and prolonged experience in organisation building and was also to some, but insufficient, degree organised at European level. Organisations such as EMBO, successful as these may be, have fairly limited effect by providing research fellowships whilst access to support for basic research state-of-art equipment and facilities at European level was perceived as important[19] but still lacking.

Looking at Table 1, the organisations established at European level can be seen as representing an increasing level of 'Europeaness'. Hence, the very early organisations are more research facilities supported by the national level and enabling collaboration in research than European level funding organisation. The diffuse organisations move a step further in that, as in the case of the ESF, they organise European and global level peer review and evaluation systems, provide conditions for collaboration in research by co-ordinating national funding. The Framework Programme funds research at European level but this is a very narrow segment of close to application projects. The ERC is the first, and unique, organisation at European level funding investigator driven, risky research based solely on criteria for 'excellence' (Nedeva and Stampfer, 2012).

Whilst the initial stages of organisation building at European level could occur in the absence of European level change agent (with the exception of the FP, of course), establishing a pan-European funding agency to support basic research would have not been possible if the European Commission did not engage in the debate and act as a 'change agent'. In fact, this institution is the only one that has the authority and can be potentially sympathetic to such development (or such development can be in its interest albeit for reasons different from the ones that the scientists promoted). In this context, the evolution that the engagement of the Commission underwent is not only academically interesting but also crucially important for this latest stage of expansion of national research spaces.

The level of alignment of national research spaces has twofold implications. On the one hand, it frames the extent to which the establishment of European level organisations with clear identity is possible. Low level of commensurability is associated with setting up either field specific facilities, organisations that are platforms for collaboration or flexible and temporary funding programmes targeting specific developments (see Table 1). A research council for Europe is an organisation with a clear and strong identity; and as such is more likely to emerge when national research spaces are fairly similar in operating funding agency (research council) based and project funding systems.

[19] The field of life sciences develops in intense competition with developments elsewhere, most notably in the United States. By the beginning of the millennium, however, there were clear signs that the life sciences in Europe are falling behind. For instance, a study (Science Watch, January–February 2003) using impact factor analysis found only two European laboratories – the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany and the MRC Laboratory of Molecular Biology in Cambridge, UK – amongst the top twenty in the world.

Furthermore, the level of alignment between national research spaces on the one hand, and these and the emerging European research space is likely to affect the level of political support at national level. In this context, the strongest opposition should be expected from the national environments with the least level of alignment, e.g. France, Italy and Spain. In light of the empirical evidence, these expectations appear problematic on two counts.

First, France, instead of opposing the establishment of the ERC, used the debate about it to establish its own research council. At the beginning of 2007, and breaking away from a long-standing tradition in research funding, the French National Research Agency (L'Agence nationale de la recherche), or ANR was established to strengthen the project based principle of research funding allocation. Apart from signalling an overall transition from supporting broad science themes and large organisation to supporting teams of researchers to carry out specific research projects, this transformation also contributes to the alignment of the national research spaces in the EU countries and to making these commensurate.

And second, opposition to the ERC in the UK, at most levels of social aggregation, persisted till the late stages of the process. This position is difficult to interpret within the proposed framework since the UK research space is fully commensurate with the one emerging at European level and thus can be expected to give UK-based researchers clear advantages in the research funding game. The position of the UK political establishment is better understood in the context of a more general scepticism to 'all things European' and more specifically distrust in the ability of the Commission to rid itself of bureaucracy.

This discussion points out to the fact that although the conceptual framework proposed here goes some way towards understanding the processes of Europeanisation of science and framing expected developments, it still does not constitute 'proof of concept' and it probably needs to be developed further to include more nuanced aspects of research spaces and their interactions. Organising science at European level can be interpreted as a string of attempts to alleviate the tension between localised research spaces and global research fields; however, whether this tension is really a generative mechanism will become clear only after the emerging European research space stabilises. Move towards further expansion of research spaces under certain conditions will lend strong support to this assumption.

5. Conclusion

In this paper we sought to interpret the process of science organisation building at European level as a result of continuous expansion to alleviate the tension between global research fields and national research spaces, and an outcome of three sets of historically specific conditions. We argued that whilst the continuous process of science organising at European level should be expected, the specific characteristics of the organisations that were established depended primarily on the variations of the specific conditions. For instance, the efforts of isolated scientific elites in the absence of developed and influential European level institutions, and low level of commensurability of national research spaces led to the establishment of large infrastructure and/or field specific organisations largely relying on national funding and coordinating national scientific programmes. Similarly, mobilising the European scientific elites, working with European level policy organisations and building on the relatively high level of commensurability of national spaces made the establishment of an organisation as the ERC possible.

A particular analytical lens was used to interpret the process of science support and funding organisation at European level. Of course, alternative interpretations analysing only policy processes, rationales and motivations are also possible. Such analyses, however, whilst capturing the process dynamics as a snapshot, don't normally provide an explanation of the reasons behind this persistent, continuous and on-going process. Furthermore, the reasons why such processes of organisation building sequentially create further conditions for accommodating the demands of knowledge communities and their elites is somewhat oblique. We believe that the interpretation used here, although by far not perfect, goes some way towards providing such explanations.

This framework can also, potentially, be used to predict further waves of research spaces expansions and organisation building. For this, it needs to be developed further to account for much more nuanced relationships between research spaces and research fields as well as the interactions between research spaces at different political levels. To this effect it will be necessary to include in the analysis other levels at which research spaces can unfold like the regional and the global ones, for instance.

Using the proposed framework also allowed us to see the establishment of the ERC as the next step in a long and continuous process of organisation building at European level and extension of national research spaces. In early 21st century, all conditions for establishing a pan European research funding organisation supporting investigator driven path braking research came together; serendipity also played its role. But as a result in February 2007 the ERC was established officially by a decision of the European Commission (European Commission, 2007). Its primary aim is to '. . .stimulate scientific excellence by supporting and encouraging the very best, truly creative scientists, scholars and engineers to be adventurous and take risks in their research.' (ERC web-site). During Seventh Framework Programme (FP7) funding in excess of 7 billion euro was channelled through the ERC and this is expected to increase during the next FP.

The establishment of the ERC marks a major step in the process of science and research organisation building at European level. What is in its future and what would the implications of its existence be for the science system, national and global, only the future would tell.

What we can say is that because the tension between global research fields and localised research spaces can be alleviated but not resolved we should expect the process of expansion and organisation building to continue.

Acknowledgements

I am grateful to Philippe Laredo, Richard Whitley, Terttu Luukkonen and Andrew James for selflessly gifting their time and considerable knowledge to comment on earlier drafts of this paper. I am also deeply indebted to the three anonymous referees who by offering competent, sensible and valuable feedback helped me improve the article and made me re-think and clarify its key notions.

References

Anon., 2003. EUROHORCs support the creation of ERC as a tool for strengthening basic research. Available at http://cordis.europa.eu/fetch?CALLER=NEWS_ERA_EN&ACTION=D&QM_EN_RCN_A=20325.

Banchoff, T., 2002. Institutions, inertia and European Union research policy. Journal of Common Market Studies 40 (1), 1–21.

Banda, E., 2002. A European Research Council: more competition in science. Interview in PubMed Central, EMBO Reports, 15 April 2002. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1084069/ (accessed January 2010).

BBC News, 2007. European Research goes for gold. Available at: http://news.bbc.co.uk/1/hi/sci/tech/6399157.stm.

Boden, R., Cox, D., Nedeva, M., Barker, K., 2004. Scrutinising Science: The Changing UK Government of Science. Palgrave Macmillan, Basingstoke and New York.

Böhme, G., van den Daele, W., Hohlfeld, R., 1983. Finalization revisited. In: Schäfer, W. (Ed.), Finalization in Science. D. Reidel Publishing Company, Dordrecht, pp. 131–172.
Breschi, S., Cusmano, L., 2004. Unveiling the texture of a European Research Area: emergence of oligarchic networks under EU Framework Programmes. International Journal of Technology Management 27 (8).
Brummer, V., Konnola, T., Salo, A., 2008. Foresight within ERA-NETS: experiences from the preparation of an international research programme. Technological Forecasting and Social Change 75 (4), 483–495.
Crane, D., 1972. Invisible Colleges: Diffusion of Knowledge in Scientific Communities. University of Chicago Press, Chicago.
Darmon, G., 1995. European Science Foundation: towards a history. In: Krige, J., Guzzetti, L. (Eds.), History of European Scientific and Technological Cooperation. European Commission, Luxembourg.
Deem, R., Hillyard, S., Reed, M., 2007. Knowledge, Higher Education and the New Managerialism: The Changing Management of UK Universities. Oxford University Press, Oxford.
Edler, J., 2003. Change in European R&D policy as a complex consensus building process. In: Edler, J., Kuhlman, S., Behrens, M. (Eds.), The Changing Governance of Research and Technology: The European Research Area. Edward Elgar, Cheltenham.
ERA News, 2006. More research for Europe: towards 3% of GDP. Available at: http://europa.eu.int/comm/research/era/3pct/index_en.html#milestones (last accessed 10.04.06).
ERC Web-site. Available at: http://erc.europa.eu/ (accessed March 2009).
EurekAlert, 2004. Common call for action on European Research Council (ERC). Available at: http://www.eurekalert.org.pub_releases/2004-08/embl-ccf081204.php (accessed March 2009).
EUROHORCS, 2004. Key principles for the foundation of a European Research Council. Available at: http://www.eurekalert.org/pub_releases/2004-07/df-kpf070804.php (accessed March 2009).
European Commission, 2007. Commission Decision on 2 February 2007 establishing the European Research Council. Official Journal of the European Union, 24.2.2007, pp. 14–17.
Gronbaek, D.J.v.H., 2003. A European Research Council: an idea whose time has come? Science and Public Policy 30 (6.), 391–404.
Gruss, P., 2004. Conclusions of the conference 'Changes and Challenges for European Research Structures and Politics' on March 1st, 2004 in Berlin. Available at: http://www.mpg.de/pdf/statementGruss.pdf via the Internet (accessed 05.01.10).
Guinovart, J.J., 2004. Science in Spain. The Biochemist, December 2004. Available at: http://www.biochemist.org/bio/02606/0045/026060045.pdf (accessed January 2010).
Guzzetti, L., 1995. A Brief History of European Union Research Policy. Luxembourg, European Commission.
Horvat, M., Guy, K., Barreto, V.D., Engelbrecht, J., Wilken, R., 2006, December. ERA-NET Review 2006: The Report of the Expert Group. EC, Brussels.
House of Commons Science and Technology, 2003a. UK Science and Europe: value for money? Report Volume I. Available at: http://www.publications.parliament.uk/pa/cm200203/cmselect/cmsctech/386/386.pdf (accessed August 2003).
House of Commons Science and Technology, 2003b. Government response to the committee's sixth report: UK Science and Europe: value for money? Available at: http://www.publications.parliament.uk/pa/cm200203/cmselect/cmsctech/1162/1162.pdf (accessed January 2010).
http://www.timeshighereducation.co.uk/story.asp?storyCode=177021&sectioncode=26.
Jacob, M., Lundqvist, M., Hellsmark, H., 2003. Entrepreneurial transformations in the Swedish university system: the case of Chalmers University of Technology. Research Policy 32, 1555–1568.
Kapteyn, P., 1996. The Stateless Market: The European Dilemma of Integration and Civilisation. Abingdon and New York, Routledge.
Knorr-Cetina, K., 1999. Epistemic Cultures: How the Sciences Make Sense. Chicago University Press, Chicago.
Krige, J., 2006. American Hegemony and the Postwar Reconstruction of Science in Europe. MIT Press: Massachusetts Institute of Technology.
Lepori, B., van den Besselaar, P., Dinges, M., Potì, B., Reale, E., Slipersæter, S., Thèves, J., van der Meulen, B., 2007. Comparing the evolution of national research policies: what pattern of change? Science and Public Policy 34 (July (6)), 372–388 (17).
Luukkonen, T., 2009. Will the European Research Council become an integrative mechanism for European research? In: Atlanta Conference on Science and Innovation Policy, October 2–3, 2009. Georgia Institute of Technology, Available at: http://www.eurecia-erc.net/wp-content/upLoads/EURECIA-ConferencePaper01-TerttuLuukkonen.pdf.
Luukkonen, T., Nedeva, M., Barre, R., 2006. Understanding the dynamics of NoEs. Science and Public Management 33 (4), 339–352.
Marginson, S., Considine, M., 2000. The Enterprise University: Power, Governance and Reinvention in Australia. Cambridge University Press, Cambridge.
Martin, B., Etzkowitz, H., 2000. The origin and evolution of the university species. Journal for Science and Technology Studies 13 (3–4), 9–34.
Merton, R.K., 1973. The normative structure of science. In: Merton, R.K. (Ed.), Sociology of Science: Theoretical and Empirical Investigations (edited and with an introduction by Norman W. Storer). The University of Chicago Press, Chicago, London, pp. 267–278.
Morange, M., 1995. EMBO and EMBL. In: Krige, J., Guzzetti, L. (Eds.), History of European Scientific and Technological Cooperation. European Commission, Luxembourg.
Nedeva, M., 2008. New tricks and old dogs: the 'Third Mission' and the re-production of the university. In: Epstein, D., Boden, R., Deem, R., Rizvi, F., Wright, S. (Eds.), The World Yearbook of Education 2008: Geographies of Knowledge/Geometries of Power – Higher Education in the 21st Century. Routledge, New York.
Nedeva, M., 2010. Public sciences and change: science dynamics revisited. In: Mucha, J., Leszczynska, K. (Eds.), Society, Culture and Technology at the Dawn of the 21st Century. Cambridge Scholars Publishing, Cambridge.
Nedeva, M., Boden, R., 2006. Changing science: the advent of neo-liberalism. Prometheus 24 (3), 269–281.
Nedeva, M., van der Meulen, B., Barre, R., 2003. Towards a European Research Council: structured review of evidence. Report to the ERCEG, October 2003.
Nedeva, M., Stampfer, M., 2012. From "Science in Europe" to "European Science". Science 336 (May (6084)), 982–983.
Nijkamp, P., 2003. The European Research Council – a point of no return. Innovation 16 (1).
Olsen, J.P., 2002. The many faces of Europeanization. ARENA Working Paper, No. 2. http://www.sv.uio.no/arena/publications/wp02_2.htm.
O'Neill, B., 2004. The European Research Council – a European Renaissance. PLoS Biology 2 (5), http://dx.doi.org/10.1371/journal.pbio.0020161, Available at e161.
Paradeise, C., Reale, E., Bleiklei, I., Ferlie, E. (Eds.), 2009. University Governance: Western European Comparative Perspective. Springer, Dordrecht.
Perutz, M., 1998. I wish I'd made you angry earlier: Essays on Science, Scientists and Humanity. Oxford University Press, Oxford.
Sgard, F., 2004. Towards a European Research Council: the point of view of Euroscience, a grassroots scientists' association. In: Dublin Conference, 2004.
Shinn, T., 1999. Change or mutation? Reflections on the foundations of contemporary science. Social Science Information 38, 149.
Stampfer, M., 2008. European Added Value of Community Research Activities: expert analysis in support of ex post evaluation of FP6. WWTF Vienna Official Report, October 2008.
Stokes, D., 1997. Pasteur's Quadrant: Basic Science and Technological Innovation. Brookings Institution Press, Washington, DC.
Tenenbaum, A., 2004. The European Research Council. Analysis Scientifica: Rivista di cultura e politica. N 4/2004. Available at: http://www.crui.it/data/allegati/links/2076/Tenenbaum_ERC.doc (accessed March 2008).
The Royal Society, 2004. The future funding of the European science base: a Royal Society background working paper V1.0. Available at: http://www.royalsoc.ac.uk/templates/statements/StatementDetails.cfm?statementid=243 via the Internet (accessed June 2005).
The Royal Society, 2004. The place of fundamental research in the European Research Area: the Royal Society response to the Mayor report. Available at: http://www.royalsoc.ac.uk/policy via the Internet (accessed March 2009).
Trondal, J., 2002. The Europeanisation of research and higher education policies: some reflections. Scandinavian Political Studies 25 (4), 333–355.
Van der Meulen, B., 2002. Europeanization of research and the role of universities: an organizational–cultural perspective. Innovation: The European Journal of Social Sciences 15 (4), 341–355.
Van der Wende, M.,1997. Missing links. The relationship between national policies for internationalisation and those for higher education in general. In: National Policies for the Internationalisation of Higher Education in Europe. National Agency for Higher Education, Stockholm.
Van Dyck, L., Peereboom, E., 2003. Life sciences in the European Research Council. EuroBiotechNews, vol. 2, no. 1. Available at: http://www.elsf.org/elsfpubs/elsfpuba2.pdf (accessed August 2009).
Whitley, R., Glaser, J. (Eds.), 2007. The Changing Governance of the Sciences: The Advent of Research Evaluation Systems. Springer, Dordrecht.
Whitley, R., 2000. The Intellectual and Social Organisation of the Sciences. Oxford University Press, Oxford.