Chapter 6
Centers and Peripheries Revisited: STEP and the Mainstream Historiography of Science

Agustí Nieto-Galan

Abstract This chapter describes the history of the international research group "Science and Technology in the European Periphery" (STEP). It analyses STEP's genuine academic culture, its complex relation with the mainstream historiography of science and the crucial role that Professor Kostas Gavroglu has played in the making of the whole project, from its foundation in Barcelona in 1999 to its further intellectual, academic growth. It also describes in detail STEP's main achievements through conferences and publications on subjects such as scientific travels, scientific textbooks and their circulation, national historiographies of science, science popularization in the periphery, scientific controversies, with the most recent meetings covering different topics organized into thematic sessions. Taking "centers" and "peripheries" as flexible and dynamic categories, the STEP research agenda has enriched the study of circulation of knowledge in the past and shall also contribute to a new multicultural approach to a truly European history of science in the future.

Keywords Centers • Peripheries • STEP • Circulation of knowledge • Appropriation • Academic hegemony • History of science

6.1 Introduction

On September 22, 1997, on a sunny, beautiful day in the gardens of the European Cultural Centre of Delphi (Greece), the coffee break was particularly enjoyable and upbeat. It was the last session of the final European Science Foundation (ESF) Conference on "The Evolution of Chemistry in Europe, 1789–1939"—a 4-year project that had brought together historians from different European countries to work on several fruitful topics: the reception of the new French

A. Nieto-Galan (✉)
Centre d'Història de la Ciència (CEHIC), Universitat Autònoma de Barcelona, Barcelona, Spain
e-mail: agusti.nieto@uab.cat

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chemical nomenclature in the late eighteenth century, the circulation of chemistry textbooks throughout the nineteenth and twentieth centuries, the professionalization of chemistry in the nineteenth century and the making of the modern chemical industry and its technological networks across the continent. For that purpose, academic expertise from the "center" (mainly France, Germany, the UK and the US) was put to work in collaboration with "peripheral" groups (mainly from southern Europe, but also integrating the Scandinavian countries and some colleagues from the East).

Although the scholarship and academic traditions were varied and sometimes uneven, the 4-year project bore fruit with the publication of a series of important collective volumes.[1] But more than that, it managed to build new personal and academic ties that have lasted for decades and have probably contributed to the making of a more "European" history of chemistry and history of science in general. In fact, that late summer 1997 still belonged to a time in which the dream of the political, social and cultural construction of Europe—beyond crude business and explicit economic interests—was still on the agenda. Those were happy times and friends and colleagues had lively discussions during that coffee break on the future avenues of historical research, as well as on local constraints, potential comparative issues and collaborative enterprises that could contribute to the continuity of the project.

Kostas Gavroglu had helped with the local organization in Delphi—actually we were all picked up in the center of Athens and brought to Delphi by quite a long coach journey along narrow roads under the tacit "oversight" of the gods of Olympus. Two years earlier in 1995, under the scientific leadership of David Knight and Helge Kragh, Kostas had already organized one of the workshops of the ESF project in Delphi, in that case, on the making of the chemist as a profession in Europe in the nineteenth to twentieth centuries. Some months earlier, I met Kostas for the first time in London at 21 Albemarle Street at the entrance to the Royal Institution. Not much later, I soon noticed how, from Mayfair's urban cosmopolitism to Delphi's delightful landscape of olive trees, Kostas seemed able to masterfully synthesize the best of both worlds.

In that coffee break at the final ESF conference in 1997, we were chatting once again on the troubles and challenges of "peripheral" historians of science who have neither Faraday's, Darwin's or Newton's stories to tell. We avidly discussed the need to develop a genuine, original historiographic framework to properly place supposedly "marginal, obscure and provincial" case studies into mainstream international historiography. We aimed to enrich traditional research subjects and priorities with new questions, new languages and new cultures, in a word, to try to give a voice to scholars who, for linguistic, cultural and even political reasons, faced serious difficulties in being heard in mainstream European historiographic

[1] The main volumes worth mentioning are Bensaude-Vincent and Abbri (1995), Knight and Kragh (1998), Fox and Nieto-Galan (1999), Bensaude-Vincent and Lundgren (2000).

forums dominated by Anglo-American scholarship. This was probably the seminal *omphalos* of STEP.[2]

After Delphi, further informal discussions gradually gave birth to the idea of gathering a small group of colleagues to found a new research group that would be dedicated in particular to reflecting "peripherally" on the history of science and technology. It took some time until we met for the first time in Barcelona in 1999. After some discussion, the new group was finally named "Science and Technology in the European Periphery" (STEP). The core of founding members included: Ana Simões, Maria Paula Diogo, Ana Carneiro, Marco Beretta, Anders Lundgren, Arne Hessenbruch, Anders Lundgren, Berna Kilinc, José Ramón Bertomeu-Sánchez, Antonio García-Belmar, Agustí Nieto-Galan, Manolis Patiniotis and Kostas Gavroglu. After producing a very short, programmatic text and opening a very simple webpage (http://www.uoa.gr/step) and an e-mail list (nodus@uv.es), the group began to work on a small scale with the original purpose of organizing thematic workshops on subjects that could potentially help to analyze "center-periphery" problems in the broader sense. Excerpts of the 1999 founding document are worth quoting here:

> The history of the transmission of the new scientific ideas from the "centre" to the "periphery", especially during the last five centuries, is a subject which deserves further investigation. Europe is going through profound transformations and these changes create a new context for (re) examining a host of issues associated with the transmission of the sciences. Recently, new nation states have come into being, new borders emerged, new institutions appeared, and old institutions restructured themselves. These changes will induce many scholars to look again at the past, and science in Europe will be among the subjects to be systematically examined. The work that has already been done, as well as the newly available sources, combined with a more open intellectual environment and increases in funding for trans-national and trans-cultural contacts might offer an unprecedented opportunity for a critical re-examination of the historical character of science and its institutions in regions and societies in Europe for which there has been little or no work at all. How should we try to study the long-standing question of the tension between particular local practices and the trends of the progressive homogenization of an international scientific community? How has this tension been particularised in the framework of a Europe aiming to dictate global policies, while at the same time was facing the shifting of boundaries among nations and cultures? And, in addition, how should we deal with the old problem of the transfer of scientific knowledge, in a historiographical context offering a great variety of approaches?".[3]

After that formal and probably too optimistic declaration, the main research aims of the group were stated in detail through six main points:

1. Reconsidering the "centre-periphery" model which has been the dominant mode of dealing with the studies on the transfer of scientific knowledge;
2. Bringing to the fore the concept of scientific appropriation and attempting to study various local discourses;

[2] In 1994, the rationale of STEP had already been outlined and developed by Kostas Gavroglu in the European project "Prometheus": European Community Project, Human Capital and Mobility, Scientific and Technical Cooperation Networks *Project Prometheus—The Spreading of the Scientific Revolution from the countries where it originated to the countries in the Periphery of Europe, during the seventeenth, eighteenth, and nineteenth centuries*, CHRX-CT93-0299, 1994–1996. For more details, see Ana Simões's chapter in this volume.

[3] STEP, first Meeting. Barcelona 1999. Unpublished manuscript.

3. Examining systematically the relationship between science, politics and the rhetoric of modernization in societies at the European periphery;
4. Joining forces to find out more about scientific travels;
5. Using networks to further our understanding of the dynamics of the various scholars from the societies in the periphery of Europe;
6. Intensifying the efforts to catalogue and make available to the international community the archival material in the peripheral countries.[4]

Since all the founding members considered travels to be a good topic for the kick-off, the next step was to quickly organize a workshop on "Scientific Travels" the following September 2000 in Lisbon. In 2002, on the island of Aegina, the group tackled the problem of scientific textbooks and their circulation; in 2004, in Aahrus, the national historiographies of science; in 2006, on the island of Minorca, the popularization of science in the periphery; in 2008, in Istanbul, the problem of scientific controversies in the periphery, as well as a revision of old STEP subjects. Galway in 2010 and the island of Corfu in 2012 hosted the next STEP meetings, both covering different subjects and organized into thematic sessions. Lisbon 2014 aimed to provide continuity to the STEP conferences, but also to reassess the main aims and objectives of the group 15 years after it was founded in Barcelona.

In the following sections, I shall describe in more detail STEP's main achievements through all these conferences, and also what I think still remains to be done in the near future. But let us first begin by sketching the academic spirit that the group has created over these years and the crucial role that Kostas has played in the whole endeavor. During a good part of its short history, STEP has developed a particular organizational style, which has only been seriously impaired by the recent draconian cuts to research budgets—mainly at the European periphery. I think that this style deserves to be known by and spread to our fellow historians of science and scholars at large.

6.2 A Genuine Academic Culture

Ever since it was founded—and here, again, is Kostas's invaluable contribution—STEP was conceived as an informal, flexible but efficient network of scholars working together without the constraints of formal scientific societies. It also aimed to help its members to overcome bureaucracy and the frequent academic provincialism of their local institutions. Admission to STEP only required, and still requires today, a simple e-mail with a short paragraph introducing the new member's main research interest and his/her potential links with the group. After acquiring a password, any member can be active in the webpage by providing information on meetings, events and new publications.

[4] STEP, first Meeting. Barcelona 1999. Unpublished manuscript.

STEP has never had stable research funding. It has mainly relied on the dynamism of each group or member and their own ability to raise money. At least up to the meeting in Istanbul in 2008, the local organizers always paid full accommodation for all STEP members attending and giving papers at the conference, who only covered the cost of their flights. In our present times of economic and political crisis in Europe and the growing commoditization of knowledge, this framework might sound naïve or utopian. Actually, the continuing growth of the group and progressive cuts in public research funding have made this ideal endeavor almost impossible. As a result, the conferences in Galway (2010), Corfu (2012) and Lisbon (2014) became closer to standard international meetings, with registration and accommodation fees, official web pages, private sponsors and so on.

I have to admit that my expression of nostalgia of a supposed "golden age" of academic solidarity may cause certain uneasiness among many colleagues, and even STEP members. This is obviously a controversial issue and probably another sign of the difficulties that Europe as a whole is facing today in building up a consistent political project for the future. Once the academic hegemony of the Anglo-American model has been taken for granted, we risk forgetting that the plurality of cultures and languages across Europe is inevitably associated with academic plurality. I am not debating the usefulness of English as "lingua franca" for our present Republic of Letters, but in my view STEP has contributed to encouraging historians of science to deal with academic plurality, accepting that, perhaps for the best, there is still a certain cultural "incommensurability" between a paper published in English in *Isis*, for instance, and another article appearing in Italian in *Nuncius* or in Spanish in *Dynamis*. From its founding, STEP has been designed to deal with linguistic plurality, to fight against linguistic barriers and cultural traditions and to try to build up a new European framework from peripheries to centers and vice-versa. We use the concept of "periphery" in two senses, as a topic of study in the past but also as a scholarly condition.

One could consider that the gradual metamorphosis from the old STEP meeting style to a more standardized academic conference is a sign of maturity and success. Nevertheless, in those 15 years some virtues have sadly disappeared: to frankly share, discuss and compare case studies from different countries in different periods; to encourage the use of a plurality of languages and cultures; to establish new ways of working on comparative history; and even to develop a schema of analogies and differences between travelers, teachers, instruments-makers, university professors and professional scientists in different countries, regardless of their "peripheral" nature in terms of science and technology.

Since its foundation, STEP has also struggled with the renewal of its leadership. There is no doubt that, among the founding members who gathered in Barcelona in 1999, Kostas played a very important role. I still remember him flying in from the US to Barcelona during his stay at the Dibner Institute in Boston and soon after his father's death, to support the old, "crazy" idea that emerged in the coffee break in Delphi 2 years earlier. However, this initial driving force by a close circle of Kostas's friends and colleagues was not in contradiction with the idea of giving voice after its 1999 inception to the new generations, to such an extent that I dare

say that the group is already led today by a third wave of scholars. In all these years, a vaguely defined Steering Committee charged with the main basic tasks needed to maintain the STEP network and the organization of the biannual conferences has sufficed to keep the pace. Even though at first the Steering Committee was mainly made up of national representatives from the different countries—one has to admit that the groups in Spain, Portugal and Greece have played a very active role in the project—it later shifted, after 2008, to representatives from the different research groups, and now, in the present, it has a more pragmatic arrangement. This includes STEP members in the SC, regardless of their national origin, but ones who are personally committed to leading the group in a horizontal, tacit organization with a reasonable division of tasks.

It goes without saying that from the informal coffee break in Delphi and the founding workshop in Barcelona to the last meeting in Portugal in 2014, the group has experienced deep transformations. What began as a modest gathering of a very small group of colleagues-friends has grown considerably in both quantitative and qualitative terms: the e-mail list (nodus@uv.es) holds more than 200 STEP members; figures on scientific productivity in books and papers issued from former STEP meetings and from individual research done under the STEP agenda are quite significant: STEP has gained visibility in national and international forums[5]; the webpage has been renewed and updated (http://www.uoa.gr/step); and new collaborations with historians of science beyond Europe, in particular with Latin America colleagues, have been developed in recent years. Furthermore, the historiographic framework of the group has been discussed, fine-tuned and widely spread.

After 15 years, a research project can probably be considered mature so now might be the time to assess what the group has "really" achieved and what, in my view, is still lacking: its pluses and minuses, its own original character, its limitations and avenues it still has to pursue in the future.

6.3 Enriching Mainstream Historiography

Taking "centers" and "peripheries" as flexible and dynamic categories, STEP research has indeed contributed to enriching the study of the circulation of knowledge in the past. It was after the founding meeting in Barcelona that the early STEP agenda had to be put into practice. For that purpose, the 2000 conference in Lisbon was devoted to exploring scientific travels from centers and peripheries as a useful

[5] This was the case, for instance, among other cases, of the European Society for the History of Science (ESHS) second International Conference, held in September 2006 in Cracow (Poland). A session was devoted there to "Science and Technology in the European Periphery (STEP): (Re) assessing some of historiographical issues". It aimed to discuss a number of issues associated with the "appropriation" of scientific ideas and practices from the various centres of Europe to the regions of the European periphery. Other STEP sessions were organized regularly in international meetings, whereas single STEP members progressively spread that historiography in individual papers and books.

category to better understand the ways in which knowledge flowed in different historical periods. Detailed reconstructions of several journeys from the eighteenth century onwards were compiled and nicely edited in the book *Travels of Learning* (Simões et al. 2003), which was probably the group's first important publication. It offered a reappraisal of the topic with case studies from Portugal, Spain, Greece, Turkey, Russia, Hungary and the Scandinavian countries. *Travels of Learning* is already 12 years old, but I am still convinced that the idea of spotlighting "travels" as an analytical category for the history of science was a seminal and very useful STEP contribution, which even today deserves further development. The book was advertised as follows:

> Travels have without doubt been a perennial source of attraction to scholars in different fields. Yet historians of science have seldom looked at travels within the European space. *Travels of Learning* will help to fill this gap. It offers a reappraisal of the topic of scientific and technological travelling and takes the viewpoint of the European peripheries [. . .] The book covers different periods of time and different local settings, and uses a variety of methodological approaches. It contributes to the clarification of mechanisms of appropriation of scientific ideas, instruments, and practices and of technological expertise.[6]

Two years later on the Greek island of Aegina, the group worked on another aspect of the circulation of knowledge, this time textbooks as mediators between experts and lay people, in particular in "peripheral" countries. Departing from the work on chemical textbooks, which had been developed some years earlier as part of the aforementioned ESF project on "The Evolution of Chemistry in Europe" (Bensaude-Vincent and Lundgren 2000), the result after Aegina was a special issue of the journal *Science and* Education (Bertomeu-Sánchez et al. 2006a) which included a selection of conference papers and again discussed mechanisms of knowledge transfer in specific local contexts and their actors, as well as their inevitable link to mainstream scientific knowledge and the standardization of academic disciplines and professions.

The special issue reinforced the STEP agenda, this time from the perspective of the classroom and the textbook as a cultural object, with a particular emphasis on localities in the periphery. As the editors stressed, the papers it contained analyzed "the changing local education systems in which textbooks were written, printed and read", and claimed for the historical reconstruction of teaching spaces, which ". . . are usually neglected by master narratives in history of science . . . but . . . can provide valuable resources for a fresh comparative approach to the history of scientific teaching practices", (Bertomeu-Sánchez et al. 2006b, 658). The publication stressed how scientific teaching is no longer regarded as an act of passively transmitting knowledge but as one of the chief spaces in which scientific knowledge is constructed. Since teaching is an activity under strong social, economic and political pressures, a cultural analysis of textbooks offered an accurate window to study science and technology and their social and political underpinnings in the European periphery.

[6] http://www.springer.com/new+%26+forthcoming+titles+(default)/book/978-1-4020-1259-4 (last accessed, 12-10-2014).

In 2004, the fourth STEP meeting in Aahrus (Denmark) provided an ideal setting to discuss the never-ending challenge of writing national histories of science with our Danish colleagues, who were then involved in an ambitious project for the publication of a history of science in Denmark (Kragh et al. 2008) which was associated with the Danish History of Science Project and the Department of History of Science (IVH) at the University of Aarhus. The call for papers already stressed that the writing of a four-volume work on science in Denmark from the Middle Ages until recent times had reinforced the historiographic debate about luminaries such as Tycho Brahe, Nicolas Steno, Ole Rømer, Hans Christian Ørsted and Niels Bohr, but also about "second class, peripheral" Danish scientists. The Danish project, which could also be applied to other small, peripheral European countries, emphasized that:

> Just like literature and art, science has served nation-building purposes, and in this process historiographies of science have played a major role. While this is the case for all countries, it is to be expected that countries in the European periphery, by virtue of being peripheral, have something in common that *is not shared* by the greater nations in the scientific centre. We want to explore how the peripheral status is reflected in the histories of science written in the various countries. The proposed theme is neither limited to particular sciences nor chronologically limited. In many countries, we find histories of science back in the seventeenth century, and later on all countries developed their own historiographical traditions with regard to their specific local scientific heritage. The aim of the workshop is to explore in a comparative perspective these traditions. Although a substantial part of the workshop is expected to deal with past historiographical traditions, we will also discuss the contemporary situation of history of science in the relevant countries".[7]

The meeting obviously brought to the fore the problem of the local scale of the historical narrative and the inevitable dependence on big countries and international trends by local actors in small, peripheral contexts such as Denmark. But in addition, it also stimulated the publication of a collective volume on national historiographies of science, first in the Greek journal *Neusis*[8] and later, in English, in the Italian *Nuncius*.[9] Both volumes probably became one of the landmarks in

[7] Fourth STEP meeting. Call for papers (unpublished text).

[8] Patiniotis (2006). The volume contains the following papers: [In Greek] Manolis Patiniotis, "Nation, Science, Identities. Historiography of Science in the European Periphery". 3–16; Ana Simões, Ana Carneiro, Maria Paula Diogo, "Issues in the Historiography of Science in Portugal. A look from the standpoint of four twentieth century types of sources" 17–39; Berna Kılınç, "History of science as a civilizational project" 40–49; Agustí Nieto-Galan, "The history of science in Spain: Imperial past, peripheries and the making of the modern state" 50–74; Ernst Homburg, "Boundaries and audiences of national histories of science: Insights from the history of science and technology of the Netherlands". 75–109.

[9] *Nuncius*, 23 (2008): Nieto-Galan, A., "The history of science in Spain: a critical overview", 211–36; Simões, A., Carneiro, A., Diogo, M.P., "Perspectives on contemporary history of science in Portugal", 237–63; Patiniotis, M., "Origins of the historiography of modern Greek science", 265–89; Kilinc, B., "Ahmed Midhat and Adnan Adivar on history of science and civilizations", 291–308; Homburg, E., "Boundaries and audiences of national histories of science: insights from the history of science and technology of the Netherlands", 309–45.

STEP's efforts to write a comparative history of science. In that case, simply bringing together papers on the historiography of science in Italy, Greece, Portugal, Spain, Turkey and the Netherlands helped the reader to identify common questions and concerns when grappling with the challenge of writing national histories of a science developed in countries that have acted as centers as well as peripheries in different historical times. Nation-building, the rhetoric of backwardness, foreign versus local luminaries, utilitarian discourses, scientific travels and local educational policies, among other issues, emerged as potential common themes for further comparison.

After Denmark, the group discussed the need to produce a more consistent theoretical framework to support further research and to attract new members—actually our nodus list had been growing steadily throughout those early years. Informal gatherings in Greece, hundreds of exchanged e-mails and draft versions ended up in a manuscript of consensus, which was signed by nine STEP members and appeared in *History of Science* in 2008 (Gavroglu et al 2008), while other STEP members soon contributed substantially to debates on the national and transnational circulation of scientific knowledge at a comparative level, as a positive sign of the vitality of the group and its capacity for renewal (Simon et al. 2008; Simon 2012, 2013; Turchetti et al. 2012).

From that simple wish list in 1999 to the group's first historiographic paper, there is no doubt that substantial progress was achieved. What we used to informally call the "theoretical paper" (TC) tried to define boundaries between old diffusionist models and colonial-postcolonial studies, and the new STEP historiography at a European level. It discussed in-depth concepts such as *appropriation* as active processes of the circulation of knowledge in which the supposedly peripheral receivers play a much more active role than in the old model. As suggested in the TC:

> A historiography of appropriation allows us to examine systematically the particular forms of the fusion of aspects of the science and technology with local traditions, and the specific forms of resistance encountered by these new ideas and techniques; the extent to which such expressions and resistances displayed local characteristics; the procedures through which the new ways of dealing with nature were made legitimate; the commonalities and differences between methods developed by scholars at the periphery for handling these issues and those of their colleagues in the central countries of Western Europe; the role of new scientific ideas, texts and popular scientific writings in forming the rhetoric of modernization and national identity; the prevailing mode of scientific discourse among local scholars; the relation between political power and scientific culture; the social agendas, educational policies and (in certain loci) the research policies of scientists and scholars; the shifts in ideological and political allegiances brought about as the landscape of social hierarchy changed; the consensus and tensions as disciplinary boundaries were formed, especially as reflected in the establishment of new university chairs; and the ideological undertones of the disputes, and their cognitive content. As a result, what emerges from this is a richer and more complex picture of how science and technology were integrated in the European periphery (Gavroglu et al. 2008, 160–161).

What I think the theoretical paper wanted to make clear was that the STEP agenda went beyond a simple "antiquarian" collection of more or less "interesting"

case studies from countries on the geographical periphery of Europe. It was a *historiographic standpoint* that could enrich and perhaps later, in due course, challenge some aspects of the mainstream historiography of science: "Starting from the periphery (or, better, *standing* on the periphery) might offer a clearer view of the intricate ideological constructs which accompany the establishment of science and technology, and at the same time, unveil their socio-political dimensions" (Gavroglu et al. 2008, 168). And for that purpose, research subjects that STEP had already tackled and those to come in future conferences became an intrinsic part of that historiographic standpoint.[10] The making and publishing of the TC ran parallel to the development of a new STEP research subject, which not only contributed substantially to enriching our historiography, but also provided more international visibility for the group. It was precisely in 2006, on the island of Minorca, that STEP devoted its fifth conference to the "Popularization of Science and Technology in the European Periphery" as a further dimension of the circulation of knowledge between experts and lay people, but also as a cultural product traveling from centers to peripheries (Nieto-Galan and Papanelopoulou 2006; Papanelopoulou et al. 2009). The meeting in Minorca provided very valuable raw material for the publication of a collective volume, published in 2009 by Ashgate, which analyzed the double "peripheral" character of popular science with new case studies. As reviews published in prestigious history of science journals have shown, the book has enjoyed a notable impact among academic circles.[11] The call for papers emphasized the potentialities of studying science popularization in peripheral countries in the following terms:

> Since a vast majority of peripheral cities in Europe have never had a Newton a Darwin or an Einstein, the historical analysis of their scientific culture should be rather focused on the spread of scientific ideas in every local context than on the history of great luminaries. What kind of images of science were developed by peripheral working scientists and early popularisers and for what kind of audiences, from late eighteenth century – the period of the emergence of the public sphere – until late 20th century - in the heart of a mass information society -? We can try to answer this question through different levels of analysis, which might be useful in the process of the writing of the papers for our next STEP meeting on "Popularisation of Science in the European Periphery".[12]

Popularization of Science and Technology in the European Periphery and the STEP project of science popularization as a whole also contributed to bringing the *daily press* to the fore as a very valuable primary source, which historians of science have not yet properly exploited but which is of great interest in central and

[10] "In particular, studies focusing on travels, forms of scientific practice and teaching, scientific controversies and on ways of communicating science in the European periphery have raised interesting questions, and provided clues to the re-examination of historical and historiographical issues." Gavroglu et al. (2008, 168).

[11] Take for instance the case of *Isis*, which does not usually review collective volumes, as a positive sign of its reception among the international community, Bensaude-Vincent (2010).

[12] Fifth STEP Meeting. Call for papers. (unpublished manuscript).

especially peripheral countries. A special issue of *Centaurus* devoted to this new topic, also published in 2009, is another important contribution by the STEP group to mainstream historiography (Papanelopoulou and Kjaergaard 2009). It is fair to mention that the idea of a crude empirical approach to the daily press was Kostas's seminal inspiration in an informal gathering of some STEP members in Aegina in 2005 as part of the early design of the TC. From that early stage onwards, it has been easy to conclude that writing the history of popularization practices in the European periphery implies a necessary recovery of a still-unknown yet enormous bibliographic heritage, including popular scientific books, science fiction novels, popular scientific journals, articles in the everyday press, pamphlets, publications and archive material from national and international exhibitions, public celebrations and tributes to local scientists and public debates on the acceptance or resistance to important theories such as Darwinism or even to controversial practices such as phrenology.

Istanbul 2008 was probably a landmark in the short history of STEP for various reasons. As mentioned above, this was the last meeting in which the old academic culture of local generosity could be put into practice thanks to the amazing hospitality of our Turkish colleagues and of Professor Feza Günergun in particular. It also became an intellectual bridge with the Eastern historiography of science, in particular with the Indian tradition of colonial and postcolonial studies in which our key concepts of "center" and "periphery" also played a crucial role (Günergun and Raina 2011; Vlahakis et al. 2006). This sixth STEP meeting provided a good opportunity to further our understanding of themes (travels, textbooks and the popularization of science in the European periphery) on which we had already made progress (see STEP publications) and at the same time opened for discussion the topic of scientific controversies in (or involving) the European periphery. As stated in the call for papers:

> While there is an extensive literature on scientific controversies they have seldom been addressed from the point of view of the European periphery. Controversies are instances of science-in-action which are particularly suited to highlight the dependence of science from local contexts, in their multiple social, cultural, political, institutional, and religious dimensions as well as from the idiosyncrasies of individual contenders particularly vis–àvis the cognitive dimensions of science. Therefore, they appear particularly suited to assess the specificities of the practices of appropriation of science throughout time and across disciplines in different sites of the European Periphery.[13]

Although the conference devoted several sections to the analysis of "scientific controversies" in the periphery, the multi-thematic nature of the meeting—now much closer to a standard international conference on the history of science—weakened our capacity to produce well-focused collective publications. But Istanbul 2008 was also a good occasion to celebrate the publication of the TC and the appearance of a new collective volume, this one published by the new generation of

[13] Sixth STEP Meeting. Call for papers (unpublished manuscript).

STEP members. Josep Simon and Néstor Herrán were in charge of coordinating the book *Beyond Borders*, which clearly aimed to make its mark in mainstream international historiography. The editors stressed the need to "problematize the local, the national and even the international through comparison and through the assessment and analysis of communication practices"; they called "for a more fruitful integration and diversification of national case studies in our field" and the "need to promote internationality in history of science as a requisite of outstanding scholarship" (Simon et al. 2008, 11).

Similar to Istanbul 2008, Galway 2010 was a fully multi-thematic conference with sessions organized by the different STEP research groups, but with the novelty of welcoming colleagues from America as a clear extension of common historiographical interests beyond the European borders. The meeting "built upon the work of previous conferences, but also encouraged a focus on areas which have so far been underrepresented in STEP (especially medicine and technology)". It particularly encouraged "contributions with a transnational dimension (either within Europe, or relations beyond Europe), or with a philosophical/theoretical angle on the nature of peripheries and their significance in the history of science, technology and medicine."[14] Galway also held a special session devoted to the Irish history of science with case studies that were unknown to the general STEP audience. As has happened in Denmark some years earlier, the meeting became an excellent occasion to learn about other aspects of science in the European periphery.

This is a trend that continued in the eighth STEP meeting on the island of Corfu, where the presence of Latin American colleagues was even more significant. The conference opened a window on current new opportunities for collaboration on joint research projects on both sides of the Atlantic. In addition, Corfu was also intended to give voice to the established STEP research groups, which, though tackling issues belonging to the mainstream historiography, were attempting to enrich it with new "peripheral" perspectives. Specialized research groups, mainly stemming from former STEP meetings, cover research subjects such as the cross-national, comparative and transnational history of science; experts; material culture of science: museums and collections; popularization of science; science for medicine; science in the press; universities; and women in science.

Perhaps Corfu did not rise to the earlier expectations of potential collaboration with colleagues beyond the European borders. However, after some months of discussion, STEP has already found a way to pursue the Corfu transatlantic agenda. No doubt much remains be done in that direction. Lisbon 2014 may present new challenges for our historiographical focus, where the old case studies, which illustrated and complemented the already-settled mainstream questions, will inevitably find their proper place in the jungle of circulation, transmission, global, transnational, international, colonial and postcolonial studies. This jungle will serve as a battlefield for challenging the academic hegemony of the discipline in the next decades.[15]

[14] Seventh STEP meeting, call for papers (unpublished text).

[15] For the question of academic hegemony see Nieto-Galan (2011).

6.4 Conclusion: Challenging Mainstream Historiography

Nostalgia over the coffee break in Delphi in that pleasing chat with Kostas and other colleagues is probably over. Recent trends in the global, transnational and postcolonial history of science might challenge the STEP research agenda, but they also include concepts such as circulation, knowledge in transit, appropriation, go-betweens, mediators, etc., which seem to be in tune with STEP's original program, and I hope they will play a relevant role in the near future.[16]

In spite of all these potential convergences, I am convinced that the problem of the heterogeneous and plural nature of European science has not yet been sufficiently tackled. In fact, in these past 15 years STEP has precisely been trying to decenter this homogeneity, which is often taken for granted. Its main historiographic standpoint still lies in the idea that a more detailed, symmetrical analysis of science and technology in Europe would probably modify some relevant aspects of the big picture that historians have tacitly agreed to in recent decades. Perhaps in the near future, STEP research will indeed contribute to reshaping and even challenging some of the tacit assumptions of present-day mainstream historiography. It shall contribute, for instance, to discussing issues such as the idealization of modern science as an activity that was not necessarily taken for granted in certain European contexts; to bring to the fore the high political content embedded in scientific debates, especially in places that felt particularly backward in specific historical periods; or even to analyze in depth the local rhetoric overemphasizing the role of foreign scientific authorities.

Take, for example, the case of peripheral scientists educated under the influence of the scientific elites of the centers. Did they uncritically favor hagiographic accounts to strengthen the scientific culture of their country? Did the uncritical reception of science of the center tinge science in the periphery with "non-political, neutral, objective accounts" that often praised international authority? Or did peripheral scientists resist and actively appropriate foreign intellectual agendas? Could we perhaps extrapolate that framework to stimulate new critical reflections on the cultural mechanisms of the circulation of knowledge among experts and laypeople and vice-versa, in both centers and peripheries?

In a similar line, peripheral scientists played a very important role in the making and circulation of scientific literature, but often without a clear distinction between the experts' and the laymen's accounts. In the periphery, in a context of low professionalization of science, the boundary between amateurs and professionals is harder to establish, and further case studies in these contexts might contribute to reframing important mainstream debates on expertise, scientific authority and disciplinary boundaries. Future studies on "amateur science"—outside of Britain—might be fed by still unknown case studies from the peripheral contexts. Equally, detailed case studies of scientists in the periphery can also contribute to

[16] See for instance: Secord (2004), Schaffer et al. (2009), Renn (2012).

analyzing strategies by local political and economic elites. The activities of provincial scientific societies across Europe were often designed to improve the arts and manufactures of a specific locality, but also to legitimize the social prestige and political control.

But we could even consider other examples. In revisiting the reasons for the fall of the Spanish Empire in the sixteenth and seventeenth centuries, Jorge Cañizares-Esguerra and Antonio Barrera-Osorio have emphasized the importance of the complex network of knowledge exchange between the center and the colonies and its later influence on the natural philosophy of the Scientific Revolution in Northern Europe (Cañizares-Esguerra 2004, 2006; Barrera-Osorio2006). Of course, Spain can be considered a center when analyzing the intellectual production at the height of the Empire, but for decades, Spanish science has been traditionally relegated to a "peripheral"—even marginal—position in the big picture of the Scientific Revolution and the emergence of what we know today as modern science. Today this assumption is under serious revision and, inspired by new peripheral case studies, it could be potentially extrapolated to other episodes of mainstream historiography.

These are, of course, only preliminary avenues for further research, but, in any case, I hope that STEP contributes in the future to making a new big picture of the history of science in Europe. Perhaps not by chance and thanks to Kostas Gavroglu's intellectual passion and personal generosity, STEP's seminal idea was born in Delphi, in one the mythical sites of the origin of Western civilization, in a country whose citizens have suffered severe, unjust humiliation in recent years as a negative indication of the weaknesses and contradictions of the European political project. In spite of this, I still hope that the STEP research agenda can humbly contribute to reversing our present pessimism and to progressively developing a new multicultural approach to a truly European history of science, which is still to come.

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