Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Science and technical education. The role of academic scientists in the training of non-academic professional groups.

Scientists have often claimed that their knowledge would serve as the ideal rationale for the improvement of industrial processes, for the invention of new materials and products, and for the general education of the unskilled workforce. Since the late eighteenth century, there have indeed been numerous initiatives to organise courses for workers, farmers and artisans, ranging from industrial apprenticeship, formal schools to itinerant lectures, and often backed up by wealthy industrialists, enlightened governing bodies or scientific societies. Well researched examples of vocational eduction schools are the British *Mechanics' Institutes*, the German *Gewerbeschulen* or the French *Écoles d'apprentissage*, although much less is known about in-company apprenticeship or informal lectures. In general, historians have been quite critical of the success of these initiatives during the early phases of the Industrial Revolution. Often the emphasis on science proved to be a barrier to reach the worker population, or, alternatively, it attracted lower middle class audiences who would not contribute to industrial employment. Much remains to be done in assessing the contribution of scientists to the general policy of modernization through education. In particular, one could ask about the social status of scientists involved in technical education, about the content of 'applied science' courses compared to popular science lectures, about the processes of differentiation or appropriation in the positioning of science as a cultural and industrial resource, or about the various motives of the different stakeholders to organize this type of education.

The aim of this session is to broaden our understanding of the scientists' involvement in the organisation of technical and vocational education, to re-evaluate the concept of 'applied science' in the actual context of industrial needs, and to identify frameworks for an international comparative perspective.

Session: Science and technical Education: The role of scientists in the training of non-academic professional group

THE ONSET OF BRAZILIAN TELEGRAPHY AND THE TRAINING OF TELEGRAPHER

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Abstract

Since the very beginning of telegraphy in Brazil, Guilherme Schuch de Capanema had the central role during the implantation of this new technology. This Brazilian engineer installed the first line in 1852 and kept ahead in the development of telegraph lines as the director of the Brazilian Telegraph Office from 1855, the year it was opened, until the end of Second Reign, in 1889. Capanema studied Engineering in Vien in the first half of nineteenth century. When he returned to Brazil, he became a Physics teacher in Escola Central, an Engineering college placed in Rio de Janeiro downtown.

The first telegraph stations were opened in Rio de Janeiro city, and all of them were installed in public offices. However, there was a problem. No one could operate the telegraphs. In a country where the majority of population was illiterate, it was not an easy task to find someone who had knowledge of basic principles of Physics, Mathematics, Portuguese and would still be willing to work hard and earn little. To solve the shortage of workers, Capanema wrote a summary with the main subjects in a notebook for the training of the new telegraphers. In fact, it is possible to say that Capanema created this profession in Brazil. He taught the first telegraphers in the beginning of this communication service. Later, as the number of stations and the length of line increased, Capanema had to quit teaching and leave his duty for his engineering college students to prepare more telegraphers.

The training of telegraphers in the beginning of telegraphy in Brazil represents a landmark about how the college can contribute for the development of national technological knowledge and the implantation of new techniques.

Session: Science and Technical Education. The Role of Scientists in the Training of non-academic Professional Groups.

THE INTERPLAY OF SCIENCE AND TECHNICAL EDUCATION - AROUND A PORTUGUESE CASE STUDY

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Abstract

By 1870 the technical education got a stronger momentum in Portugal towards its effective implementation as a national commitment. It was in this context that in Coimbra the former drawing school Brotero is transformed into the Industrial and Industrial Drawing School Brotero (1889).

The Portuguese government tried to find abroad teachers able to introduce the modern subjects, namely on industrial drawing, physics and mechanics, and industrial chemistry. The French chemical engineer Charles Lepierre (1867-1945) would be the person in charge for industrial chemistry. He did not come through the international admission, but after a few months short stay in Lisbon. He took his degree (July 1887) in Paris from *École de Physique et Chimie Industrielle* and had been a student of Pierre Curie and of the Portuguese chemist Roberto Duarte Silva. This last influenced his decision to come to the Lisbon Industrial Institute as a chemistry demonstrator, accumulating with the direction of chemical practical works at the Lisbon Polytechnic School. However, reasons not completely known led him to move to Coimbra (August 1889) to be in charge both of the industrial chemistry course as of producing analytical work for external purposes. He did a relevant work not only at the school but also at the university where he was simultaneously leading the microbiology laboratory.

In 1897 a free chemistry course was created at Brotero school, lectured by Lepierre, gathering several students, from the school and from outside (university included). This seemed interesting and led us to getting more information on its characteristics.

In this communication we will try to unveil details on the interaction that was developed by the chemical scientist in charge of developing the chemical practice at Brotero industrial school, his role as a docent and researcher at a university laboratory and the characteristics of his free chemistry course.

Session: Science and Technical Education. The Role of Scientists in the Training of non-academic Professional Groups.

DO WORKERS NEED SCIENCE? PUBLIC LECTURES ON SCIENCE IN NINETEENTH CENTURY BRUSSELS

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Abstract

In the first years after Belgium's independence (1830), technical education appeared to be roughly organized in a seemingly transparent three tier system. But, as the Belgian constitution warranted an absolute freedom of education, there was a large variety of local initiatives, leading -according to some observers- to a complete chaos. There was no clear definition of teaching requirements for each level, the system of education ranged from workshop practices to theoretical lectures, students from one level were not automatically accepted at a higher level, etc. What was lacking was a coherent consensus on technical education, reflecting the many social groups (fabricants, politicians, teachers, philanthropists,…) involved in technical education. In this paper we will concentrate on the views of scientists in formulating a specific view on technical education.

The Brussels public lectures on science were perhaps somewhat atypical of the more organized school systems in other major towns, but precisely this loose structure of the instruction provides some insights in how topics, organisation and personnel were constantly shifting. The Brussels lectures were established in 1826 as a general means of education for the 'uncivilized' population. After 1830 the public lectures refocused on practical education for industry. Institutionally, they were connected to the *Musée de l'Industrie*, an institution devoted to industrial innovation and advice to factory owners. Later still, the courses were once more redefined as a complement to the theoretical nature of higher education. In 1869, the lectures were integrated in the newly founded *École industrielle*.

This paper will attempt to retrace the ephemeral existence of the Brussels public courses, in comparison to the better known industrial schools in other Belgian towns. In particular, the role of chemistry in capturing the very definition of (higher) industrial education will be analysed, and the influence the public courses had on the careers of the chemists involved.

Session: Urban peripheries? Science in "Second Cities" around 1900

URBANIZATION AND KNOWLEDGE-DISTRIBUTION IN THE FIN DE SIÈCLE BUDAPEST

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Abstract

The city has been in its long history always a forum of knowledge production and distribution. But the complex interrelationship between the city, knowledge and social actors was examined in the research rather from individual perspectives (such as migration) or on institutions concentrated (e.g. university history).

For the historical East European Studies this complex and still poorly researched correlation means both a methodological and a theoretical challenge, particularly with regard to the "late" Urbanization and industrialization of the East European region during the 19th Century.

The example of this space in time of 1880-1914 makes it clear that knowledge transfer takes place not only between cities, but even within these cities; not just between Berlin and Budapest or Berlin and Zagreb, but also within the urban area of Budapest where the transferred knowledge was taken and received by the various actors in different ways and formats.

The lecture focuses on the interaction of knowledge transfer and urbanization in Central Europe 1880-1914, through analyzing the "distribution activity" of the Hungarian philosopher *Bernát Alexander* in the context of the rapid urbanization of Budapest. The various "knowledge formats" of his transfer activity had been deeply influenced by the urban development of Budapest. The emphasize of the urban perspective enables us shifting away from the dichotomy of center and periphery, rather concentrating on the specific local conditions that gave rise to the transfer, adaptation and use of modern knowledge.

Session: Urban peripheries? Science in "Second Cities" around 1900

CHANGING IMAGES OF FINNISH URBAN PLANNERS AND TRANSPROFESSIONALISM IN THE EARLY 20TH CENTURY

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Abstract

The paper presents a case of Finnish urban planning in the early twentieth century. How architects' images of their own profession were changing at the time urban planning came on their professional field? On the methodological side, the paper presents ideas of transnational web and of histoire croisée. The networks between urban planners were strong. There were World's Expositions, international urban planning conferences, etc. These had an important role in shaping the expertiness and practices in urban planning. This all comes with a problem: how to define the web, and how to outline certain connections – where to stop researching?

A partial solution on defining the web is to specify the focus. Context of the study is architect Eliel Saarinen's office and home called Hvitträsk on the countryside of Helsinki in 1903–1923. Besides being a workplace, Hvitträsk was also a home for architects and their families. In Finland there weren't special education for urban planners at that time. This makes Hvitträsk even more peculiar place: it functioned as a training place for future Finnish urban planners. Hvitträsk was an active locus of urban planners situated in the periphery of Helsinki, which makes the case atypical.

Not only were the networks transnational but also transprofessional. How the actors on different scientific spheres – statistics, medicine, engineering, etc. – were constructing the rising professionalism of the urban planners on their behalf? This question is discussed by taking the town plan of Munkkiniemi and Haaga – situated in the rural municipality of Helsinki – as an example. It was made in Saarinen's office ca 1910–1915 by tens of architects and other specialists – even by their families. Even though there were conflicts between municipal actors, planners – architects and engineers – and for example sponsors, it can be shown that there was, after all, strong cooperation between these players.

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PLANNING FOR BARCELONA 1929 IN THE 1910S: AN EXHIBITION OF ELECTRIC INDUSTRIES?

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Abstract

The Barcelona 1929 International Exhibition was born in the early 1900s as an 'Exhibition of Electric Industries and Their Applications' promoted by a group of Catalan businessmen with interests in the electricity sector. It was one of the several cultural initiatives planned to strengthen the position of Barcelona within Spain, which was that of a 'second city' in a powerful yet peripheral region. In 1915, the architect Josep Puig i Cadafalch developed a first general planning for the site, in which a 'Great Hall of Light' was to have a central position. However, the focus of the event shifted quickly from electricity to Spanish art and industry. The 'Great Hall' disappeared in Puig's 1916 remaking of the plan, and its place was taken by a 'Palace of Ancient Art'. What was the 'Great Hall' about? Why did it exist so ephemerally in Puig's planning? How should we understand the substitution of a building dedicated to electricity by another one dedicated to ancient art?

This paper will present unknown materials about the design and contents of the 'Great Hall of Light' as conceived by Puig i Cadafalch in 1915. It will also explore the changing value of electricity as the main topic for the International Exhibition from the early 1900s to 1916, and will finally consider the substitution of the 'Great Hall of Light' by a 'Palace of Ancient Art' in the context of a cultural and political project planned by the elite of peripheral Catalonia for the whole of Spain.

Session: Urban peripheries? Science in "Second Cities" around 1900

BETWEEN CENTRE AND PERIPHERY: PLANNING THE PORT OF LISBON IN THE 19TH CENTURY

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Abstract

Portuguese and foreign engineers were involved in projects to improve the infrastructure of the port of Lisbon in the 19th century. They linked their plans to ideas of progress and modernity.

Lisbon's modernity was characterized by plurality. It was connected to a transnational exchange of ideas. This was reflected, on the one hand, in the training of engineers, who accumulated professional experience abroad, and, on the other hand, by the fact that ideological positions from England and France for example circulated in Portugal.

The projects of three French engineers working at different times in Lisbon – namely José Pedro Pezerat in the 1860s, Thomé de Gamond in the 1870s and Hildevert Hersent in the 1880s – will be analyzed, in order to answer the following questions:

How did the plans of these French engineers retroact on Portugal? Does the concept of "centre" and "periphery" help to understand the exchanges between France and Portugal? Or should this binary concept be replaced by a transnational perspective?

Although most engineering plans did not materialize, they are nevertheless worthy of study because of what they tell us about cross-border planning ideas, the discussions they provoked and the connections they drew between technology, economy and culture.

Ultimately, the aim of this paper is to challenge the concept of "centre" and "periphery" by applying a transnational perspective. Thus, the most attention will be given to the circulation of knowledge between France and Portugal.

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EXHIBITING NATURE AND SCIENCE IN THE URBAN PARK OF BARCELONA CA. 1880-1920

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Abstract

In 1872 the Barcelona City Council approved a plan to turn the site of the former military citadel into a park. The park planned by Josep Fontserè (1829-1897) had the ambition to become a lung for the city. The transformation of the grounds of the citadel wanted to offer a place for leisure and rest, healthy and regenerating. The monumental and hygienist character with which the park was conceived, replaced the repressive discourse that had dominated the land occupied by the citadel -for about a hundred and fifty years-, by a discourse of universal progress and of civility.

In 1882, the *Museu Martorell* was inaugurated in the *Parc de la Ciutadella*, the first public museum in Barcelona, devoted to natural history and archaeology; in 1888, the park hosted the *Exposición Universal* for the promotion of science and industry; and, in 1892, was created the *Parc zoològic d'aclimatació i naturalització*. Starting in 1906, a newly created Board of Natural Sciences of Barcelona launched a program for popularizing natural sciences within the park, including various exhibitions such as an open-air collection of large stones representing the geology of Catalonia, a sculpture of a mammoth or an exhibition on aquafarming and fishing.

Like many urban parks in Europe, the *Parc de la Ciutadella* was an "appropriate" place where to locate a museum and a zoo. But, we argue that the program of the Board was original as it extended the activity of such institutions beyond their walls, into the park. Our point is that, in the midst of an intense period of industrialization, the program of the Board intended to provide its citizens with a "civic" or "urbanized nature": a nature that was domesticated, economically exploitable, and conceived of as a resource on which to base the modernization of the country.

Session: Urban Peripheries? Science in "Second Cities" Around 1900

TECHNOLOGICAL SEDUCTION: THE POLITICS OF AMUSEMENT PARKS IN BARCELONA (1888-1929)

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Abstract

Around 1900, amusement parks were spaces of leisure in which specific public images of technology were tacitly produced and reproduced in several large cities all around the world. Drawing on the work by Tony Bennett, this paper analyzes several amusement parks in Barcelona as disciplining spaces that worked through fun and seduction.

This paper argues that roller coasters and mechanical rides were conceived as tools for amusing the bourgeois class as well as the working masses in a city which was internationally well-known by its class conflict. Beyond the promise of a future satisfaction of basic material needs for all through science and technology, the ideology of progress also offered to the workers the –regulated- experience of technological fun. This paper discusses the politics of technological seduction and raises the question of what symbolic role did amusement parks play in the urban and human geography of Barcelona.

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FROM COLLABORATION TO CONFLICT: ANARCHIST CULTURE, URBAN SPACES, AND SCIENCE IN BARCELONA (1868-1909)

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Barcelona became one of the world's most important centers of anarchist activity in the last decades of the nineteenth century. At the time, the city transformed itself into something quite alien to the dream of a socially cohesive and functional *new city* envisioned by Ildefons Cerdá`s urban planning. In the first decades of the twentieth century a divided city emerges. A true abyss between upper middle class and proletarian quarters opened up, reaching social conflict unbearable heights.

The emergence of a divided city had a significant influence on the specific urban sets in which those scientific topics considered of any use by libertarian leaders – thermodynamics, evolution, theory of degeneration - were debated. It actually changed the map in which those practices associated with science communication took place. In the late 1880s it was still possible to find among anarchist groups a sort of dialectic - not totally exempt of conflict - between the generation of a web of properly anarchist cultural institutions and a particularly active role in freethinkers associations, secular schools, and masonic lodges. The latter implied, explicitly or implicitly, some level of collaboration with radical fractions of Barcelona's middle class based in the common ground of their staunch opposition to Catholicism. In this fight *science* was considered instrumental in eroding the very basis of religious *truths*. This sort of informal alliance became increasingly difficult in the 1890s with its cycle of terrorism and repression. In the early 1900s, Ferrer i Guardia's Modern School marked the last attempt to reestablish a common field between part of the working class libertarian elite and middle class radicals. The uprising of July 1909 ("Tragic Week") made clear this sort of fragile alliance was doomed. New ways of communicating *science* adapted to a socio-spatially segregated city were needed.

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ALTERNATIVE BELIEFS IN BARCELONA: ITS SOCIAL AND SCIENTIFIC CLAIMS AROUND 1900

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Abstract

A way to trace an interaction between science and urban spaces is by examining the circulation of knowledge through texts produced by the local press and associations, which shows the relation between science and everyday issues in the city. In this paper we present an alternative Barcelona's actor: the spiritist movement. Along with spiritualism, spiritism refers to a revival in the belief in spirits and the spread of mediumistic activities in Europe and the United States around 1850.

Spiritism in Spain offered an attractive spiritualist and allegedly rational and scientific alternative to Catholicism, which soon aroused sympathies inside the anticlerical urban atmosphere. The movement was led by middle class intellectuals and was mostly followed by the working class. Barcelona's spiritist centres were active in constructing alternative political and scientific webs of knowledge. They were a driving force for social reform, promoting progressive initiatives that worked towards social equality.

The aim of this paper is to examine the scientific rhetoric of spiritist discourses around 1900 in connection to their moral and political urban concerns. We analyse several initiatives that reinforced the link between spiritism and progressive movements, such as laicism or feminism, and that contributed to create an alternative thought network in Barcelona.

Session: Urban peripheries? Science in "Second Cities" around 1900

LA COLONIA OBRERA AND THE PROLETARIAT CLASS. A BIOTYPOLOGICAL STUDY IN MEXICO CITY

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Abstract

The biological study of one of the poorest neighborhoods in Mexico City was analyzed by a group of experts with the aim to understand the failure of the recent educational reforms. This colony, named la colonia Obrera (Labourer colony), was created after the massive movements from the field to the city during the Revolution (1910). It was settled on a piece of land that had previously been a garbage dump of the borough Cuauhtémoc in the center of the city where all the Government offices and the National University were located. Within the design of the neighborhood was included the primary school Ramón López Velarde; whose students were analyzed by José Gómez Robleda, one of the main biotypologists and criminologists in Mexico during the first half of the 20th Century. In this work will be shown the manner in which was determined the Proletariat class after the research done in this neighborhood. The study included physical anthropological and physiological analysis as well as the implementation of mental tests. It was framed in an "Organicist" perspective combining the living circumstances (like nutrition, sanitation, and electricity) of the primary school students with their physic-biological conditions (typology, physiology, intelligence). As part of the conclusions it was determined that the Proletariat class, in spite of its racial nature, could progress when its socio-economic circumstances were improved.

Session: Urban peripheries? Science in "Second Cities" around 1900

COPEPODS AND FISHERBOYS: ADVANCED BIOLOGICAL RESEARCH AND STREET POVERTY IN THE CITY OF NAPLES

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Abstract

Following completion of his studies in 1881 the German zoologist Wilhelm Giesbrecht (born in 1854) began work at Naples' *Stazione Zoologica*. Until his death in 1913, he would live and do his research at this path-breaking German institute for biological sciences. The thirty years Giesbrecht spent in Naples were extremely productive, his main research focus being a systematizing classification of the copepod subclass of crustaceans. While establishing himself as an internationally renowned scientist, Giesbrecht was steadily active as a photographer and journalist. My paper has two focal points: on the one hand the complex ties and tensions evident in Giesbrecht's approach to Southern Italian society and culture, and the ways he communicated with Naples' residents; on the other hand the role the Stazione Zoologica played as a source of work in Naples and the institution's efforts to integrate Neapolitan scientists, laborers, and fishermen into its microcosm. In this respect, it is important to note that, from the perspective of urban history, the chronological caesuras in Giesbrecht's long stay in Naples coincided with the cholera outbreaks of 1884 and 1910/11, these being symptomatic of Italy's north-south divide. With Italian unification in 1860/61, Naples had been pushed to Europe's periphery. Giesbrecht's photographs of cityscapes and street scenes, and of the everyday life of Naples' impoverished fishermen, together with his journalistic articles on the city, reveal the dialectical interaction of an internationally important center of biological research with a large city increasingly removed from its once central political-cultural position in the course of the waning eighteenth century.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Amateur Astronomy As Circulation Of Knowledge

This session stems from the STEP research group Popularization of Science and Technology: Centres and Peripheries

Amateur astronomy mirrors professional astronomy in several ways. Activities typical of professional astronomers – building telescopes and other instruments, managing observatories, making observations and discoveries, publishing papers, teaching and engaging in public outreach – have also been pursued by amateur astronomers. Many have built their own telescopes; some others have devised entirely new optical and mechanical designs. Individual amateurs and astronomy clubs have built observatories, some of which endowed with sophisticated technology. Many amateurs have been monitoring objects such as comets, meteors, sunspots, and variable stars, thus supplying professional astronomers with loads of valuable data. They have made discoveries of objects such as novae, supernovae, and comets. Skillful amateurs sometimes publish their work in professional journals. Amateurs have also been involved in public outreach, often leading lay audiences to their first acquaintance with celestial wonders.

From a historians' point of view amateur astronomy is a very rich and diverse culture. Its history, however, is yet to be explored in depth, and what we know about it so far is significantly based on anglo-saxonic perspectives. This session is intended to contribute for a more nuanced and transnational picture. For that purpose, we shall approach amateur astronomy as circulation of knowledge – within and between its various cultures, between amateurs and professionals, and over geographical and institutional borders. We shall discuss the constitution of data networks connecting amateurs and experts; the correlated issues of standardization, control and empirical verification; the circulation and appropriation of instrumental techniques, namely the international repercussions of the North-American Amateur Telescope Making movement (ATM); relations and exchanges between amateur groups based in different countries and regions; and the engagement of amateur astronomers in the popularization of science.

Session: Amateur Astronomy as Circulation of Knowledge

HOW TO MAKE KNOWLEDGE WITH NETWORKS: SWEDISH AMATEUR ASTRONOMERS AND THE CONSTRUCTION OF HIERARCHICAL NETWORKS OF OBSERVERS

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Abstract

Even in times of an increasingly hardened distinction between the scientific expert and the lay observer, amateurs have been engaged in the creation of scientific data. During the 20th century, amateur astronomers have taken part in observational programmes monitoring dynamic celestial phenomena such as meteors, sunspots, comets, and variable stars. They have occasionally uncovered new phenomena and been credited with the discovery of hitherto unknown astronomical objects.

Networks of observers have been built up to train and organize lay participants in astronomical observation. Routines for validating the collected observations were developed, and communication infrastructures were implemented to facilitate the flow of astronomical data across geographical, organizational, and academic borders and boundaries. Networked collaborations of amateur observers have, thus, emerged as a knowledge-production tool in astronomy, and it raises a number of issues relating to the involvement of amateurs with experts.

In this paper, the construction of such networks of observers in 20th century Swedish amateur astronomy will be discussed. With a focus on the study of variable stars, the presentation discusses the practice of hierarchical networks of observers, and how procedures and systems for the systematic collection, archiving, and dissemination of observational data were built up.

Session: Amateur Astronomy as Circulation of Knowledge

THE RECEPTION, COORDINATION AND DISSEMINATION OF NORTH-AMERICAN ATM IN SWEDISH AMATEUR ASTRONOMY

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Abstract

Swedish amateur astronomy at the turn of the century 1900 didn't have the stature of the British or the North-American tradition; rather it was limited to a handful of isolated individuals. There were no organisations promoting astronomy or trying to recruit amateurs, there were no astronomical journals accessible to amateurs, there were no public observatories were members of the general public might get inspired catching a glimpse of the celestial wonders. When the Swedish Astronomical Society was formed in 1919 one of its main aims was to try to change this state of affairs, and to try to muster a larger group of organized amateurs for the benefit of astronomy. But despite the best of intentions and a lot of activity it didn't work out, the most important reason being that telescope prizes was way too high to attract others than a few wealthy. The Society soon lost its interest in amateur astronomy, and it was not until the early 1940s, and with the reception of the American Amateur Telescope Making movement (ATM), that amateur astronomy returned to the Society's agenda. A small group within the Society started to publish articles and compendiums on telescope making. In parallel they made arrangements with suppliers of optical glass, with opticians for eyepieces, and with the optical industry for aluminization of mirrors. And the work paid off. In just a couple of years the Society managed to quadruple the number of amateur telescopes, thus helping Swedish amateur astronomy to reach critical mass. In my paper I will outline this key episode in the history Swedish amateur astronomy, and discuss the reception, coordination and dissemination of North-American ATM on Swedish soil.

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CAMILLE FLAMMARION (1842-1925) AND THE AMATEUR ASTRONOMY AROUND 1900: A EUROPEAN NETWORK

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Abstract

The Société astronomique de France (SAF) was founded in 1887 by the famous French popularizer Camille Flammarion. Flammarion was the author of the widely-read *Astronomie populaire* (1880), but his ambitious project for the popularization of astronomy had begun earlier when, in 1862, he published *La Pluralité des mondes habités*, which in 1880 was in its 26th edition. In 1882, Flammarion began to edit the journal *L'Astronomie* which, at the end of the century, sold around 100,000 copies. Flammarion's genuine style for the popularization of astronomy and his emphasis on the amateur character of the field made a great impact across Europe.

From 22-24 June 1914, a meeting of Astronomical Societies was held at the Astronomical Observatory in Paris, under the auspices of the SAF. It brought together representatives of the astronomical societies of Amiens, Bordeaux, Le Havre, Lille, Marseille, Montpellier, Paris, Rouen, Toulouse, Tunis, Ambers, Basel, Barcelona, Brussels and Manchester. The conference attempted to use the term 'popular' astronomy to promote amateur-like activities. It encouraged the creation of new astronomical societies, new popular observatories, and prizes for the best students on astronomy courses. It aimed to establish itinerant lectures and libraries to strengthen the network of amateur astronomers at the international level.

Through a detailed analysis of the 1914 Conference, this paper will try to assess the amateur character of astronomy at a European level. It will also revisit centre-periphery concepts, when applied to amateur astronomy and to Flammarion's case in particular.

Session: Amateur Astronomy as Circulation of Knowledge

ARTIFICIAL SKIES AND REAL TELESCOPES: CONCEIÇÃO SILVA (1903-1969), THE GULBENKIAN PLANETARIUM, AND THE ATM MOVEMENT IN PORTUGAL

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Abstract

Eugénio Conceição Silva (1903-1969) was a Portuguese naval officer, lecturer at the Lisbon Naval School, and amateur astro-photographer. Usually portrayed as a lonely student of the heavens, he was actually an internationally well-connected amateur who had his work on micrometers and double stars included in the canon of the Amateur Telescope Making movement – the manual with the same name, edited by Albert G. Ingalls in the U.S.A.. Conceição Silva was particularly active first as an observer of double and variable stars, and later as an astro-photographer, between the mid-1930s and the early-1950s. By this time, a community of amateur astronomers was practically non-existent in Portugal. From the 1950s onwards, Conceição Silva became increasingly involved in the popularization of astronomy. In the early 1960s he began to steer the foundation of the Gulbenkian Planetarium (GP) in Lisbon, which was innaugurated in 1965. Conceição Silva conceived the planetarium not only as the traditional theatre of the heavens but also as a focal point for the constitution of a local amateur community. Under his guidance, the GP started to host workshops in telescope making, open to the public. Conceição Silva also left some guidelines for a small observatory that was eventually appended to the planetarium, in the early 1970s. The workshops and the observatory were pivotal in the formation of an amateur circle from which the Portuguese Association of Amateur Astronomers emerged in 1976. The Association can thus be regarded as a result of the appropriation of the ATM movement in Portugal.

In this paper I will analyse how Conceição Silva built his network of trust amidst the international amateur milieu, and how he used it to gain the status of a national authority in astronomy, recognised and respected even by the few professional astronomers in Portugal. Then I shall explore the political implications of Conceição Silva's activity as a populariser of astronomy. He lived most of his life under the dictatorial regime of the Estado Novo. He never intervened directly in political matters, but his opposition to the regime is well-known. I will argue that his popularizing activities, and especially the foundation of the Gulbenkian Planetarium, corresponded to a veiled form of political resistance, which he managed to accommodate into the regime. Finally, I will discuss the importance of telescope - making as a catalyser of an amateur community in a backward country, where it was difficult to acquire even the most basic astronomical equipment.

Session: Amateur Astronomy as Circulation of Knowledge

AMATEURS VS PROFESSIONALS. SPANISH ASTRONOMERS AND THE OBSERVATION OF MARS IN 1956

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Abstract

This paper analyses the difficult relationship between Spanish professional and amateur astronomers in early Francoism (1939-1959). In that period, amateur astronomers undertook different initiatives, such as the construction of small reflecting telescopes, the publication of a new astronomical journal (“Zodiaco”), and, in collaboration with British astronomers, the foundation of the “International Lunar Astronomical Society”.

These lively attempts contrasted with the stagnating situation of national professional astronomy, which until the 1960s poorly developed in terms of the renovation of observational facilities, the implementation of new research programs, the participation in international observational campaigns, and the consolidation of academic teaching.

Moreover, amateurs' independent initiatives caused strong reactions by official scientific institutions. As a matter of fact, the representatives of amateur associations were relegated to a secondary position in the hierarchically structured organization of astronomical sciences within the Spanish National Research Council founded in 1939 by Franco's Government. This tense relationship was particularly evident in the case of the observation of Mars organized in 1956 by amateur astronomers from Barcelona and Ibiza in collaboration with foreign astronomers. As this paper demonstrates, the controversy that followed the observation of the red planet reveals the absence of programs and scientific goals shared by Spanish professional and amateur astronomers. Furthermore, the case of Mars is useful to show that issues such as prestige, authority, and control were deeply involved in the organization of scientific initiatives in Franco's Spain.

Session: Amateur Astronomy as Circulation of Knowledge

AMATEUR TELESCOPE MAKING IN SPAIN: THE CASE OF JOSEP COSTAS (1918–2011)

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Abstract

It was in September 1936 – only few months after the outbreak of the Spanish Civil War – that the *Grup Pro Divulgació Astronómica del Baix Montseny* (PDA) was founded. This local association for the popularization of astronomy, based at the North-East of Catalonia, was run by a group of amateur astronomers. One of its founding members was Josep Costas. This paper will present the contributions to astronomy of Costas, who by the end of the twentieth century had to be recognized as one of the most prominent amateur astronomers in Spain. In fact, he was a crucial actor in the development of amateur telescope making in Spain during the twentieth century.

The paper will provide some results of the research in progress on some notebooks written from the late 1930s to the early 1970s by Costas, in which he registered the observations of the PDA. It will be underlined how the early activities of this group of Catalan amateur astronomers – engaged both in astronomical observations and in the popularization of science – benefited from the refractors they made on their own. They also established close relationships with prestigious Spanish astronomers and popularizers, such as Josep Comas i Solà. No doubt, the PAD played an important part in the circulation of astronomical knowledge between various cultures and sites.

As it will be shown, Costas had during the second half of the twentieth century become a particularly relevant figure in the field of amateur astronomy and telescope making. He produced in the late 1950s his first reflector telescope, using the techniques explained by Jean Texereau in his book *Construction du télescope d'amateur* (1951). The success of such an experience led Costas to get involved in the production of more mirrors. In fact, he made more than 3,500 parabolic mirrors for reflecting telescopes that were used for decades by amateur astronomers in Spain.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Centres And Peripheries In The Changing Understanding Of Pellagra, 1850-1915

From the time of the first systematic studies of pellagra, in the 1760s, until 1937, when the link between pellagra and nicotinic acid was verified, there was no single agreed-upon aetiology of the disease, nor a single treatment, but a series of conflicting aetiologies and therapies. By the period covered by this session, the deficiency disease pellagra had been epidemic in Italy for over a century—disfiguring, debilitating, causing dementia and eventually death for thousands of sufferers—was reaching a peak in Romania, and was breaking out in the United States. Yet the understanding of pellagra, research into its causes, and the medical and public health responses in all three countries differed substantially.

As a contribution to understanding the role of experts in the periphery, the three papers in this session explore the circulation and contested natured of medical expertise, between centres and peripheries, both within Europe and beyond. Priani's focuses on the treatment of pellagrous insanity in the Venetian asylum of San Servolo. If left untreated, pellagra leads to forms of insanity, often violent. In Italy, local psychiatric hospitals were the only concrete form of treatment offered to pellagra sufferers by the authorities. No systematic study has been done into these institutions with regard to the treatment regimes adopted and the (largely French) theoretical models lying behind them.

Scrob and Gentilcore, in their different ways, both shift the emphasis to the contested nature of investigations into the nature of pellagra at a time when these were becoming more urgent, as the disease broke out in the United States. The time when the field of expertise was shifting away from Italy and towards the U.S. is ideal for understanding the circulation of contested knowledge and the role of national research cultures and public health policies in countries as diverse as Romania, Italy and the U.S.

Session: Centres and Peripheries in the Changing Understanding of Pellagra

LOUIS SAMBON AND THE CLASH OF PELLAGRA AETIOLOGIES IN ITALY AND THE UNITED STATES, 1904-15

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Abstract

My paper looks at the contrasting reactions to a novel and provocative explanation of the aetiology of pellagra proposed by Louis Sambon. My aim is to compare medical realities and responses to the epidemic in Italy and the United States, at a time when the former country was about to lose its centrality in pellagra expertise to the latter. The reception of the Sambon hypothesis allows us to trace the circulation of ideas between shifting medical centres and peripheries.

Sambon was a dynamic Franco-Anglo-Italian doctor-scholar who became lecturer at the London School of Tropical Medicine. In a series of publications beginning in 1905, Sambon applied the 'tropical diseases' approach to pellagra, arguing that the disease had nothing at all to do with maize consumption, as the Italians had long thought, but everything to do with the bite of a parasite-carrying insect.

With 150 years spent studying pellagra, Italian pellagrologists ridiculed and marginalised Sambon's hypothesis. The dominant theory, that pellagra was due to the eating of spoiled maize, was behind (limited) government legislation that coincided with a significant downward trend in pellagra cases. Sambon's aetiology offered no medical or political advantages in the war against the epidemic. By contrast, on the other side of the Atlantic, Sambon was awarded 'star' status and his hypothesis gave shape to the earliest investigations there. A disease new to the U.S. merited a new theory, and Sambon's fit the bill, appearing at a time when a whole range of diseases was being attributed to microbes and parasites.

Sambon's notoriety was short-lived. If the U.S. press could still label him a 'world pellagra expert' in 1914, by this time new aetiologies for pellagra were being proposed, which returned the focus to maize as the causal agent, although this time in terms of a dietary deficiency.

Session: Centres and Peripheries in the Changing Understanding of Pellagra

FROM FRENCH TO GERMAN MODELS IN THE DIAGNOSIS OF PELLAGROUS INSANITY IN LATE NINETEENTH-CENTURY ITALY

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Abstract

How did homegrown expertise acquired in the field of the aetiology and treatment of pellagra in Italy interact with areas such as psychiatry where many of the dominant ideas originated from elsewhere in Europe? How can we reconstruct the reception of these schools of thought?

My paper addresses these questions by looking at a specific aspect of the pellagra pandemic in Italy, that of the insanity that occurs in its final stage. My source consists of several thousand patient files at the Venetian mental asylum of San Servolo, from 1840 to around 1910. The province San Servolo served was one of the hard-hitest by the pellagra epidemic. From an examination of clinical files, I consider the manner and modality of admission and the typologies of treatments reserved for patients.

Patient records provide an icomparably rich source, allowing a comparison of clinical practice with theoretical models. In particular, I analyse the diagnostic processes and underlying models of medical 'rationality' to shed light on centre-periphery relations in the diagnosis and treatment of pellagra. Diagnostic intersections between pellagra and psychiatric symptoms led to hybridisations such as 'pellagrous melancholy', 'pellagrous frenzy', 'raging frenzy', and so on. These refer to French nosography, initiated in the beginning of the so-called 'Alienstic' period, a nosography was recognised at San Servolo. It was considered a fixed point of reference, attested to by explicit quotes and references in the clinical files, annoted by the hospital's doctors. Here Italian expertise in the field of pellagra was conditioned by French dominance in the field of psychiatric medicine. Then, as my study of the nomenclature used in the patient records suggests, from the 1870s and 80s the dominant diagnostic model shifted to the German school of biological psychiatry, which continued to dominate until the early twentieth century at San Servolo.

Session: Centres and Peripheries in the Changing Understanding of Pellagra

WHY NOT A ROMANIAN OR ITALIAN GOLDBERGER? CENTRE AND (SEMI) PERIPHERY IN PELLAGRA RESEARCH

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Abstract

In 1914/1915 Joseph Goldberger published several articles on the prevention, treatment and cause of pellagra that paved the way to its conceptualization as a deficiency disease. However, Goldberger's research and its positive reception by the U.S. medical community can be better understood by reference to the recent developments in the understanding of beriberi as a deficiency disease (Fraser and Stanton, 1909 and 1910 and Casimir Funk, 1912) rather than to the novelty of his findings or to any extraordinary feature of his experiments.

My paper will provide a comparative assessment of the reception and incorporation of the new research findings on beriberi in discussions on the aetiology of pellagra by the U.S., Italian and Romanian medical communities as revealed by their published research during the 1910s. My purpose is to elaborate on the paradox that the U.S. medical community has been the quickest to apply the new findings in the study of pellagra in spite of the fact that it had the least developed tradition (prior to 1910) of an understanding of pellagra as a 'deficiency' disease. The analysis illustrates the multiple influences stemming from the medical communities' simultaneous positioning at different levels in the pellagra knowledge system, in the medical research system more generally and in the economic system on the process of appropriation of the new findings. In this sense, the U.S. medical community is shown to have moved from the periphery to the center of pellagra research by taking advantage of the opportunities offered by its central position in the medical research system and of its nation's position at the center of the economic system. By contrast, the acute awareness of their nations' (semi) peripheral position within the economic system made the Italian and Romanian medical communities less receptive to any understandings of pellagra that would have required preventive measures deemed to exceed the limited resources of their states. Furthermore, their very position at the center of research on pellagra made these communities less capable of grasping the full significance of the recent findings on beriberi given their thorough familiarity with decades-long debates and reassessments of the merits and limitations of a purely dietary explanation of pellagra.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Planning For Peasants: Ideologies Of Agronomic Science Compared

This panel takes a comparative, transnational approach to how 'peasant' or 'family farmers' have been conceptualised and ideologically located in national planning for agricultural development, and in the R&D programmes established as part of these plans. After a long period when it seemed to be broadly accepted that small farmers were doomed to extinction by agronomic progress, we are now entering an era where the moral, environmental and social claims of small farmers are once again receiving serious consideration even by the World Bank. 'Peasant-friendly' science is on the rise.

But what does 'small farmer' mean to policy makers and scientists in any specific context? Is s/he envisioned as a guardian of the national landscape and loyal supporter of the LDP, as in Japan in the 1990s? A cutting-edge producer of pricey heritage cheese in Italy under CAP policy? The quintessential Malay 'son of the soil' in Malaysia's Green Revolution in the 1970s (Bray)? An enterprising and knowledgeable innovator 'growing' the California citrus industry into a successful model later transplanted to the wider Mediterranean (Saraiva), or a laggard resisting India's inexorable modernisation (Raina)? Do expert elites aim to educate small farmers, eliminate them, or mobilise their knowledge, and how do such preferences feed into disputes about 'good science' (Maat)?

In focusing on how small farmers are conceptualised and 'cultivated' in different iterations of agronomic science, the papers in this panel address agronomy as a travelling science, transforming and mutating its concepts, goals, agents, objects and modalities as it moves, initially, from Western centres to colonial or post-colonial peripheries, and later as it is appropriated and reconfigured in new, non-Western centres engaging with redefined peripheries.

Session: Planning for peasants: ideologies of agronomic science compared

FEEDING THE PEASANTS AND FEEDING THE NATION IN MALAYSIA'S FIRST GREEN REVOLUTION

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Abstract

After traumatic race riots between Malays and Chinese in 1969, the Malaysian government drew up a detailed development framework, the New Economic Policy (NEP), to be administered through a series of Five-Year Plans. One of the principal goals of the NEP was to address what the radical nationalist Mahathir Mohamad called 'The Malay Dilemma', the poverty and powerlessness of the *bumiputra*, the Malay 'sons of the soil', institutionalised by the ethnic policies of British colonial rule. One reason for the prevailing poverty among the Malay population was that the majority had been, and remained, confined to rice farming as a livelihood.

Under the 2nd and 3rd Malaysia Plans (1971-75, 1976-80), as part of a multi-pronged strategy for reducing Malay poverty and developing Malay economic and political power, the Malaysian government transformed the rice-farming sector. In close consultation with the International Rice Research Institute, Green Revolution technologies, infrastructure, R&D, financial support and extension were introduced to Malaysia's main rice-bowl regions. The drive to boost rice-production had a two-fold goal: to enrich Malays by making rice farming more profitable, and to ensure national food security in an era of regional instability and perceived Communist threat.

To what extent were the twin goals of Malaysia's first Green Revolution compatible, with each other, and with the modalities of Green Revolution science as elaborated for export from the international research centre at IRRI? This paper takes the case of the Kemubu Agricultural Development Authority in the impoverished East Coast state of Kelantan to examine the tensions that arose between feeding Malay peasant rice farmers, who as 'sons of the soil' were conceptualised by the government as the iconic citizens of multi-ethnic Malaysia and the primary beneficiaries of the NEP, and feeding the nation.

Session: Planning for peasants: ideology of agronomic science compared

AGRONOMIC SCIENCE AND RURAL WHITE SETTLMENT: REPRODUCING THE RURAL PORTUGUESE VILLAGES IN AFRICA

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Abstract

This paper addresses the imperial entanglements of agronomic science, focusing on the state-sponsored schemes of rural white settlement in Portuguese Africa. Implemented against the tide, in the mid-1950s, when anticolonial movement was on march, these schemes were full of contradictions. In fact *Estado Novo* dictatorship created *colonatos* at Cela, Cunene and Limpopo (the first two in Angola and the last in Mozambique) in order to mimic Portugal villages and settle poor Portuguese peasants (Penvenne, 2005). Based upon small agricultural property, family work with hoe and bullock cart (without recruiting African labour), and modern irrigation systems, those rural settlements did not accomplish its political and ideological aims. In spite of being presented as well succeeded experiences of the Portuguese 'colonisation genius', they were too expensive and did only attract few settlers. Saraiva (2006) has already called our attention to the paradox of those projects: to fulfil the vision of a rural Portugal, they were part of large state development plans where technology played a key role.

Crossing written sources (both form colonial and scientific archives) and oral sources, I intend to analyse the relation between policymakers and agricultural engineers mobilized to study the soils and its agricultural suitability in the regions chosen for the *colonatos*. On one hand, I want to discuss the political and ideological uses of the scientific research, in particular when it did not meet official expectations; on the other hand, I want to comprehend the experts' agency regarding agrarian policies for the empire.

Session: Planning for peasants: ideologies of agronomic science compared

PARALLEL TRAJECTORIES IN AGRICULTURAL SCIENCE: RICE IMPROVEMENT IN ASIA UNDER COLONIAL AND GREEN REVOLUTION DOMINATION.

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Abstract

Agriculture is a key driver of the global economy and vice versa. According to the economistic perception, dominant in agricultural science over the twentieth century, farmers are commodity producers, susceptible to market incentives and guided by profit-seeking behaviour. Consequently, agricultural science selects for technologies that can be packaged, mass-produced and distributed widely. Seeds and fertiliser are typical products. An alternative view considers farmers as skilful practitioners, adjusting their farm to the local ecology, interacting with concurrent social and economic structures. This perspective selects for technologies aimed at the management of fields and crops. Focusing on rice improvement in Asia, this paper traces the parallel history of both perspectives. Examples are taken from colonial science in Indonesia, the history of the International Rice Research Institute and the recent debate about the System of Rice Intensification. Protagonists of the two perspectives not only are engaged in controversy and opposition but also incorporate each other's ideas and solutions. The dialogue and shared solutions between the two perspectives, this paper concludes, is mainly a scientific dialogue to which farmers, the assumed beneficiaries, remain outsiders.

Session: Planning for peasants: ideologies of agronomic science compared

MODELING NATURE: AGENTS AND HORIZONS OF PLANT BREEDING IN THE FIRST HALF OF 20TH CENTURY IN MEXICO

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Abstract

The transformation of the agriculture in the first half of the twentieth century was possible by a set of theoretical, technical and material innovations such as the rediscovery of Mendel, the development of plant genetics and the configuration of hybrid seeds, the synthesis of ammonia and the development of agrochemicals, as well as the development of industrial engineering and the mechanization of the agricultural processes.

In this context it also occurred a socioprofessional transformation on the arena of plant breeding and agricultural development agents: peasants, historically linked to the improvement of crops, were displaced because of the emergence, professionalization and consolidation of agronomists as the new experts in the field; nevertheless, the agronomists also faced an emerging body of geneticists who were gradually gaining ground in the institutions and in the decision spaces on plant breeding and agricultural development.

In our communication we wish to problematize this process by reviewing the controversies that these different groups had in Mexico, especially after the introduction of models and technicians sent by the Rockefeller Foundation in the 1940s, studying the different horizons proposed by each group, as well as the mechanisms of legitimation that they used. This analysis will seek to explain what led to the rise of some and the eclipse of others.

Session: Planning for peasants: ideologies of agronomic science compared

ARTICULATING A NEW AGRONOMY: PEASANTS AND CONTEMPORARY HISTORY IN ASIA

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Abstract

The family farm and peasant-friendly science are in the limelight today. Not surprising; peasants are necessary for large capitalist farms and industrial agriculture to survive and grow. For theory, recall Kautsky; for empirical evidence look at the rapidly growing Indian economy with 84 percent marginal and small farms, or any of the 500 million small farms across the world. This paper argues that peasant performance of hybrid socio-technical processes (Richards, Latour) offers an opportunity for equitable and sustainable development. Agronomy as a politically and geographically constituted science, a world-view, gives us the handle to this transformation. But the current neutral 'blanket recommendations' agronomy, playing to the techno-sciences gallery, has limited capacity to articulate this opportunity to decision-makers.

The political/geographic trajectories of the green revolution (GR) and the current global double green revolution (expert-driven, politically-legitimized 'sustainable intensification') both stem from the 'scientific' peripheries of Europe – U.S.A., Canada and Australia. Unlike the original GR, today's double GR comes at a juncture where knowledge is patented, priced and owned by industry, international aid has declined, the GR's negative agri-environmental consequences are evident, 'peak oil' and price volatility play havoc with food security. With climate variability and change, experts now pay attention to the knowledge-base of small farms that minimizes crop-loss - use of drought- or pest-tolerant varieties, mixed cropping-systems, soil-moisture management, etc. These features of small farms are churning life back into agronomy, undermining scientific certainty that "laggard" peasants should abandon their production repertoires and ecosystem-management routines for modern agronomic techniques, external inputs, global quality specifications. New centres or redefined peripheries articulate this new agronomy. This paper uses the evolution of South Korea's Hansalim movement and response to India's BGREI (Bringing Green Revolution to Eastern India), to analyse agronomic expertise and articulations of the peasantry, natural resources, capital and sustainability.

9th STEP Meeting: Science and Technology in the European Periphery, Lisbon, Portugal

Session: Planning for peasants: ideologies of agronomic science compared

CLONING CALIFORNIA: ORANGES, GENETICS, AND THE MEDITERRANEAN

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Abstract

This paper follows the orange trail to unveil an early version of global California. It explores the role of geneticists in converting orange growers into innovative horticulturalists organized in cooperatives producing commodities for world markets in the first decades of twentieth century. Cultures of cloning oranges are put in relation with the cultivation of growers.

The citrus orchards that contributed to the image of Los Angeles as Mediterranean Eden were cloned in the new Mediterranean being cultivated in South Africa and Australia, as well as in the old Mediterranean, namely in Palestine, Algeria, Morocco, and Spain. Attached to the oranges came the Californian cooperatives and their labor and racial relations. By tracing the trajectories of geneticists and their scientific artifacts, the paper intends to highlight the transnational nature of the cooperative experience across a new global Mediterranean and to offer an alternative understanding of the presence of the United States in the world.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Addressing The Dynamics Of Museums

In recent years museums studies have become a fruitful new object for historians of science. Much attention has been devoted to the history of specific institutions according to broader studies of the museums' role in society and in imperial ambitions in the wake of colonial studies and knowledge production. Questions of space and architecture were placed alongside cultural perspectives and the biography of things enlarged the focus.

There is no doubt that museums are the result of specific regional, national or political and cultural imperatives: they have an enormous potential in communicating science and culture. Museums are educational tools as well as research locations. If ambiguity and paradox are to be placed alongside one another, then static and dynamic are the two sides of the coin. The panel will focus on the dynamics of the claims of newly established and now long-forgotten museums, mainly in the Habsburg Empire and on the periphery of Europe. We will look at institutions which did not survive very long and which after a period of struggle were incorporated in larger well-established museums. We will point out that the physical, intellectual, national and material context of these museums was constantly changing and that conflicts of disciplinary, political, cultural and personal interests were part of this development.
To focus on those museums that were not able to survive can give us hints as to how to understand the elements of dynamics of the multifunctional agency of the museum in a general approach.

Session: Addressing the dynamics of museums

THE INVESTIGATION AND THE MUSEALIZATION OF THE ALPINE REGION IN KLAGENFURT 1911-1923/ 42

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Abstract

The foundation of the first Alpine Museum in the 1870s may be traced back to the "Alpino Italiano Club" and their establishment of the "Museo Nazionale della Montagna Duca degli Abruzzi" in Turin. This was followed in 1905 by the opening of a "Swiss Alpine Museum" in Berne. And finally, in 1911, there came the establishment of a further similar institution in the form of the German and Austrian Alpine Association in Munich. While all of these museums are still in existence today and have developed well, the museum that was established in Klagenfurt (Carinthia) existed only in the years 1911 – 1923/42.

The concentration in time of the foundation of these institutions prompts a number of questions. In the first place it is of interest to ask in what cultural and political-national constellations these particular types of museum were established, what were their characteristics, and what particular aspects contributed to the situation where the museum in Klagenfurt was not able to survive as an independent institution.

I will focus on the natural-historical museum landscape in German-speaking countries and keep the "Alpinism" as a cultural practice on the horizon. In this way I will provide a synoptic study of the Museum in Klagenfurt, using different focal lengths and exposures, and looking not only at the organizational and cultural-national dimensions, but also at the interpretation and the role played by the natural sciences and visualization.

Totally new forms for the presentation of our expanding knowledge of the mountain world (such as the use of reliefs) and the historicization of alpine development, the history of mountaineering: this combination is a pre-condition for all alpine museums. But how could this be achieved in a period of accelerated change and a dynamic view of nature? This ambiguity will be at the centre of this paper.

Session title: Addressing the dynamics of museums

THE SPELEOLOGICAL MUSEUM IN LINZ (1912-1917) – NATIONAL RIVALRIES AND DISCIPLINARY IDENTITIES

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Abstract

Regarding the nationalism in science at the turn to the 20th century, the paper discusses the foundation of the first Speleological Museum ("Reichshöhlenmuseum") worldwide in Linz (Upper-Austria) in 1912 and its purpose to support the establishment of speleology as a systematic scientific discipline. Housing in the fortification tower on the mountain "Pöstlingberg" near Linz, the exhibition consisted of several showrooms where models of caves, special equipment like a folding boot to cruise subterraneous rivers and an aquarium with living specimens of a grotto olm were presented. The museum only existed for some years and was integrated in a new exhibition of the Federal Museum of Upper-Austria in 1917.

My research examines the institutional and social conflicts, which had an effect on the compilation of the museum's collection and finally led to its incorporation in a more established institution. Manuscripts discussing the arrangement of the exhibition, objects of its collection and articles in museum communiqués are used as sources and are analysed regarding the content.

The results show that the foundation of the museum, initiated by speleologists themselves, was mainly supported by federal institutions, like the Ministry of Agriculture, the Natural History Museum in Vienna and the Cave Commission of Postojna (Slovenia), which donated the exhibits. The musealization of this comparatively unknown field of research had more than educational purposes. For the visitors the exhibition should prove the prosperous development of the discipline and communicate the economic and scientific benefit of speleology to the public. For the speleologists the museum became the location of memorialization and identity.

In the multi-ethic atmosphere of the Austrian-Hungarian Empire, the museum symbolized the claim to leadership of the German speaking social elite. Embedded in colonial ambitions, the collection should manifest the idea of integration and dependence, bringing together diverse exhibits from different parts of the monarchy.

Session: Addressing the dynamics of museums

THE BRAZILIAN MUSEUM IN VIENNA NOTES ON AN EPHEMERAL INSTITUTION

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Abstract

For a time the Brazilian Museum in Vienna with its unique focus on Brazilian items, full of novel specimens from a quite unknown region received much public attention. As a result of the Austrian expedition to Brazil, started in 1817, rich collections of preserved animals, plants, minerals, landscape and plant paintings and ethnographic objects were transferred from a region thus on the periphery of European perception into the focus of scientific interest.

Since still little is known about visitors and their perception of early 19th century collections as well as museum displays or practices, the Brazilian Museum offers a productive case study. Its astonishing collections were a main attraction for scientists, spectators and media. One aim of this presentation is to review their response to this new institution. Visitors´ reports and official instructions will show how the museum organized newly acquired specimens, integrated them into current systems of knowledge and presented them to the public.

The paper also discusses the reasons why the Brazilian Museum was dissolved in 1836. Although part of the private collections of the Emperor, the fate of this short-lived museum depended not only on private predilections. Initially circumstances, not scientific considerations caused the foundation of the Brazilian Museum. The Imperial Cabinet for Natural History in Vienna, responsible for the organization of the expedition, was simply too small to store the enormous quantity of “epistemic things”. With its various collections and its dedication to a single country the conceptions of the Brazilian Museum were rather unusual, combining elements of “classic” collections of Natural History, art museums and “national museums”, the latter being much in fashion at that time. Analysing the discourses about meaning and purpose of Natural History then prevailing in Vienna will answer the question why this unique and innovative approach found no adequate support.

Session: Addressing the Dynamics of Museums

MUZEALIZATION AND STATE-BUILDING IN THE EASTERN HABSBURG REALMS. THE CASE OF THE TRANSYLVANIAN MUSEUM SOCIETY

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Abstract

My proposal addresses the nineteenth-century history of the Erdélyi Múzeum Egyesület (EME, Transylvanian Museum Society, 1859–1950) and its scientific collections in Transylvania, Hungary. The proposal asks about the self-positioning of the provincial "academy", including its policies regarding the maintenance and development of its collections during its active lifetime, between 1859 and 1919. The presentation inquires into the struggles of the institution, the latter seeking to balance "national," "regional," and "European" or "general" agendas. The paper will ask how the temporary choice of any of the above directions correlated/conflicted with the demand of scientific professionalization, which was the result of negotiations with state authorities, 'foreign' specialists and the local public/clientele.

The EME was based in its hometown Cluj (H. Kolozsvár) and was founded by the provincial Hungarian social elite in the 1840s. By the time of the actual start of the Society, its polymath scholarly profile had become obsolete. Scientific modernization appeared dramatic for 'grassroots' provincial scholarship, as it was linked to governmental policies external to and beyond the direct control of Transylvanians. The liaison with the Hungarian government proved fatal, when Transylvania joined Romania at the end of World War I. The contracts allowed the successor Romanian state to nationalize most of the museum collections, which paralyzed institutional development.

The presentation raises the question whether the dilemmas of the EME were general problems of provincial scholarship, or had to do with the conditions of nation-building in the Habsburg Monarchy. A comparison with the trajectory of the Transylvanian (Saxon) Brukenthal Museum and the (Saxon) Verein für Siebenbürgische Landeskunde will highlight both the contingencies of the EME strategies, as well as the situational differences linked to the privileged, although fragile status of the 'titular nation' amidst competing nationalities that was typical to Transylvania, Hungary and indeed, to most of contemporary Habsburg Monarchy.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Science And Religion In The Periphery: A Missing Historiography?

"Science and Religion" is a topic of much interest among historians of science, scientists and the general public in the English-speaking world (Britain and the USA), but it does not have the same impact in countries at the European periphery. Our first interest is to explore the reasons for this asymmetry. Some elements that come to mind are the differing roles of national religions and churches (both terms not necessarily synonymous) in European countries, the lack of freedom of speech in some clerical contexts, or the propaganda by some positivistic stances in denying any public or epistemic role to such religions and churches. Furthermore, the old idea that the periphery was the place to "receive" finished epistemic products may have induced the idea that science-and-religion disputes in the periphery were just an example of the reaction against scientific and technological novelties coming from the so-called centre.

The papers in this session want to fill this gap in the tradition of STEP and explore whether the historiographical tools used in the Anglo-american world regarding "science and religion" may or may not be used to study science in the periphery. The papers cover a wide range of interests and approaches, from the traditional study of the influence of the Jesuit network and influence, to the impact of neo-Thomism in fin-de-siècle Europe, to the fate of Jewish scientists.

Session: Science and Religion in the Periphery. A Missing Historiography?

THE SCIENCE, RELIGION AND POLITICS COCKTAIL IN FRANCO'S SPAIN. LA ASOCIACIÓN MENÉNDEZ PELAYO

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Abstract

As John Hedley Brooke puts it in his classical monograph on Science and Religion, "conflicts alleged between science and religion may turn out to be between rival scientific interests or conversely between rival theological factors". Such conflicts, I should like to endorse with this paper, may also turn out to be between rival political factors.

In the first decades of Franco's regime (1939–1975), science was meant to be subordinated to God and the Nation in a way that scientific, national and religious interests were officially intertwined. The Spanish National Research Council, established right after the end of the Spanish Civil War, explicitly endorsed these principles. Twenty years on, though, the feeling that Franco's Crusade was loosing strength prompted some Catholic intellectuals and scientists into action.

In order to raise the prestige of "the Catholic intellectual" and "re-Christianise culture", the Asociación Menéndez Pelayo was established in Madrid in 1957. Gathering prominent members of the scientific, cultural, educational and political establishment, by 1959 it had already reached more than a hundred members, spread across the country. It had also built a media network with more than 30 Spanish publications, including the widely read newspaper *ABC*. They sought to build on science and culture to achieve their political aims.

Thus, through Catholic doctrine claims, a group of anti-aperturist, monarchist, traditionalist, extreme right-winged characters, critical with some political fractions in power or with some political strategies of Franco's government, managed to build a network by which they gained prestige, influential positions and popularity. With this scientific and cultural project, they pushed for political changes, such as the restoration of the monarchy.

Session: Science and Religion in the Periphery. A Missing Historiography?

A NEO-THOMIST EXPERIMENT IN PSYCHOLOGY STARTED IN LEUVEN, 1891.

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Abstract

Desiré Mercier, the founder of the *Institut Supérieur de Philosophie* in Louvain, Belgium – also named at the time *Ecole de Saint Thomas* – envisaged an important role for empirical scientists at his philosophy institute. Experimental psychology had a special place in his attention. In a well-equipped laboratory, Mercier expected independent experimental research to be done that would fructify philosophy, bringing philosophers in contact with what he called "science in the making". In this paper, I discuss how Albert Michotte van den Berck (1889-1965), a student of Mercier and soon director of the laboratory, performed this 'experiment' set up by Mercier. I explore how Michotte interpreted the role of an experimental psychologist in this neo-Thomist framework, and how this interpretation developed during his long career. Michotte succeeded in putting the Louvain psychological laboratory on the international map of science while, as I will show, he also fulfilled his role as a catholic scholar. Explicit references to his neo-Thomist background are hard to find in his psychological publications. I will look in particular at his use and understanding of abstract stimuli images, to show how these incorporated aspects of neo-Thomist epistemology as well as contemporary moving image technologies. These images would travel to many other psychological laboratories all over the world, to become part of the canon of psychological stimuli images.

Session: Science and Religion in the Periphery. A Missing Historiography?

WAS RELIGION AN OBSTACLE FOR NEWTON IN SPAIN?

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Abstract

In this communication I discuss new data on the acceptance of Newton in Spain. Newton was certainly not a Catholic and some of his theories were not Catholic-friendly. Ironically, however, the Spanish Church had him in higher esteem than Catholic thinkers such as Copernicus or Galileo. For instance, Benito Feijóo (1676-1764) encouraged his study and wrote that "Isaac Newton was heretic [...] Notwithstanding, it has not been found in his philosophy, so far, anything opposed, directly or indirectly, to the true beliefs".

Among university professors Newton was not very important, since they generally supported Scholasticism. It was among practical mathematicians where Newton was first accepted. Jorge Juan (1713-1771), for instance, backed Newton's science and he published *Examen maritimo theorico-práctico* (1771, 2 v.) a treatise on navigation based on Newton's theories for the "Academia de Guardiamarinas" (Coastguards academy). This book had no problems with the Church or the Holy Inquisition, contrary to his earlier book *Observaciones astronómicas y físicas* (1748) which was in trouble for having accepted the Earth's motion. In other military academies the need for high level mathematics played an important role in the reception of Newton's ideas. Calculus and Newton's physics were introduced into the Colegio de Artilleria in 1774, and in 1787 at the Academia de Barcelona of military engineering: religion played no part in these discussions.

I will also refer to the role of the Jesuits, who had a leading position in Spanish culture until their exile in 1767. It is not easy to specify their position on Newtonianism. Tomás Cerdá (1715-1791), for instance, was a Newtonian. His course on astronomy was prepared following Benjamin Martin's *Philosophia Britannica* (1747, 2v.). But Jesuits were also holding important posts in the Holy Inquisition, thus creating some tensions among representatives of the Company.

Session: Science and Religion in the Periphery. A Missing Historiography?

AFTER THE "SYLLABUS ERRORUM". REVISITING SCIENCE IN THE LATE NINETEENTH CENTURY.

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Abstract

On December 8, 1864, Pope Pius IX published the "Syllabus Errorum", a document summarising many previous documents of the Catholic Church on matters theological and philosophical. The Syllabus, together with the Vatican I Council, was seen by many as a reactionary response to modernity, one that would be followed by Pope Leo XIII and his encouragement of Thomism and Pius X and his attacks on modernism. In this paper I shall examine the effect these policies had on science in Catholic-dominated Spain, and compare it to other places like Ireland, Italy, Bavaria or Austria. Following Eric Hobsbawm's notion of "Invented Tradition" and Peter Harrison's thesis on the nineteenth-century origins of the conflict thesis I shall explore the response to the anti-modernist policies from practitioners of science in some Spanish institutions. I shall also take into account the classical work of Frank M. Turner on the professional dimension of the conflict between science and religion, and distinguish between the attitude towards established sciences like physics, chemistry or medicine on the one hand, and the political and institutional conflicts of power on the other, where religious, anti-clerical and secularist discourses were widely used.

Session: Science and Religion in the Periphery. A Missing Historiography?

JEWS AND SCIENCE IN THE 20TH CENTURY

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Abstract

A number of statistics seem to prove that Jews were exceptionally successful in science in the 20th century. High distinctions and famous results are enumerated as arguments. Various theories attempt to explain these statistics relying mostly on some properties of Judaic religion, in particular the high esteem for reading books and the centuries-old practice in interpreting texts. This paper argues against these approaches by analyzing a study written by Michael Polanyi, chemist and philosopher, on Jews in science. Polanyi belonged to a group of Hungarian Jewish scientists which included John von Neumann, Leo Szilard, Eugene Wigner, Edward Teller, Paul Erdos, George Polya, and many others. My claim is that political and sociological factors influenced the success of these people rather than their religion, not to mention any racial approaches that also emerge in the literature. The most important factor is that they fled from anti-Semitism, flared up in the periphery, to a more tolerant centre

Session: Science and Religion in the Periphery. A Missing Historiography?

INGENUITY BETWEEN SCIENCE AND RELIGION. EDUCATIONAL REFORM IN THE EUROPEAN PERIPHERY AT THE TURN OF THE 17TH CENTURY

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Abstract

This paper (and its companion piece at EHSH) studies the early modern European periphery as a laboratory for educational reform. Here, I study Jesuit educational reform in the sciences at the turn of the 17th century, culminating in the *Ratio Studiorum* (1599). In particular, I will look at the work and activity of the Jesuit Antonio Possevino (1533–1611), one of the Society's foremost activists and polemicists. Besides his work in France and Italy, Possevino founded many Jesuit colleges and schools in the European periphery, in places that now belong to the Baltic States, Poland, the Czech Republic, Romania, Sweden and Russia. After professional disappointments, he concluded that national politics and diplomacy were doomed to fail, although his educational reform had had remarkable success. He therefore devoted the rest of his life formulating and formalizing his pedagogical system. As a result, his *Bibliotheca Selecta* was published in 1593, a standard setting Catholic compendium which included a method of study (*ratio studiorum*), focusing on history, the sciences (*diciplinis*), and salvation.

In this paper, I will focus on Possevino's adaptation of the work of the Spanish physician Juan Huarte y Navarro (1529-1588), and in particular his *Examen de ingenior para las ciencias* ('Examination of ingenuity for the sciences') (1575). Huarte had developed a physiological theory of man's natural capacities (ingenium), based on Galen's theory of qualities and humors. Huarte argued that one should learn to recognize one's own abilities in order to choose a science, art or profession that corresponds best to one's talents. Possevino did not follow Huarte's naturalist suggestions, but insisted on a selection mechanism controlled by the Church. The most important question for him was not how to identify talent, however, but how to "cultivate" a young man's "ingenium". In the process of elaborating his educational reformation, Possevino redefined "ingenuity" and promoted the concept of "culture". Through Possevino's missionary and educational activities, this "culture" would come to shape scientific education in the European periphery, especially there where protestant, catholic and orthodox traditions collided.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Problematizing Transnationalism: Center/Periphery Relations In International Environmental Science Programs, 1945-2002

In recent years, 'transnationalism' has become a buzzword in the human sciences. With this symposium, we intend to shed new light on the various ways in which scientists practiced transnationalism within postwar International Organizations (IOs). In particular we are looking at how these scientists participated in creating, renegotiating and possibly disintegrating center/periphery dichotomies. In the investigation of center-periphery relations in transnational science, postwar IOs, which so far have received little attention from historians of science, can serve as valuable case studies. The establishment of the UN system in the immediate postwar era triggered an unprecedented growth of IOs in both number and power. Since WWII, scientists have embraced intergovernmental bodies and professional institutions such as ICSU as privileged spaces to pursue specific political and scientific agendas. The panel specifically aims to explore how postwar science and IOs, which have traditionally presented themselves as the embodiment of the 'universal', dealt with (and possibly reified) hierarchies between center and periphery. Looking at cases such as UNESCO's first science program, conservation scientists in ICSU's International Biological Program and WWF in the 1960s, and the conservation efforts of IUCN and UNEP after 1970, we intend to investigate how different center-periphery constellations have materialized in these institutions. How were peripheries presented? How were they included in these international networks? How were center/periphery dichotomies mediated within these new spaces? Were they overcome, reproduced or did new types of hierarchies emerge within the international scientific community?

Session: Problematizing Transnationalism: Center/Periphery Relations in International Environmental Science Programs, 1945-2002

SWEDISH ANDALUSIA: BIRD MIGRATIONS AND INTERNATIONAL ORGANIZATIONS

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Abstract

In 1968 the Swedish ambassador in Spain sent a formal petition to the Spanish government requesting permission for the World Wide Fund (WWF) to acquire the Hinojos marshes. These marshes were in the Southern tip of Spain adjacent to the Doñana Biological Station, an ornithologist dream-spot which had been established a few years earlier in one of the WWF's first preservation efforts. The 1968 Swedish campaign involved other Scandinavian and northern European nations. For instance, in that same year, a voucher signed by WWF-Holland called for special donations to save Hinojos from the threats of reforestation and irrigation with agricultural purposes. The rescue operation, the voucher explained, was still able to save, "to begin with, many thousands of Netherlands migratory birds."

This paper traces the transnational nature of European Cold War ornithology through a history of the international dimensions of Doñana Biological Station and National Park. It explores the ways in which different actors relevant in post-war European nature conservation organizations first took an interest in Doñana. It then follows some of these actors as they participated in the creation of the WWF in the context of Cold War intra-European scientific organizations. It then goes back to Doñana to analyze some of the challenges and opportunities for preservation in the European economic and political periphery. It argues that framing Spain as a peripheral country helped the WWF's scientists in Northern Europe to include Doñana along projects in the developing world, namely Africa and Latin America. In turn, Spanish scientists used international connections with the European economic core to reinforce their position at home.

Session: Problematizing Transnationalism: Center/Periphery Relations in International Environmental Science Programs, 1945-2002

ALL FOR COFFEE: THE UNITED STATES AND THE LATE PORTUGUESE EMPIRE (1950s)

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Abstract

After an agreement between the Portuguese and the American governments, the Coffee Rust Research Centre (CIFC) was launched in Lisbon, in 1955. Its principal goal: to prevent the spread of the rust *Hemileia vastatrix* – which in the end of the 19th century had almost totally destroyed Arabica coffee plantations in Africa, Asia and Oceania – to the American continent. Lisbon became therefore a global database of every coffee rust variety existing in the world. From 1955 onwards, research centers of coffee-producing countries could now send to one place their bred plants and test breeding programs for rust resistance at a global scale.

Environmental conditions were the alleged reason as to why Portugal was considered the ideal place to centralize research on coffee rust. Were they so? And, why was Salazar's government willing to fund an institution aimed to study *Hemileia vastatrix,* if Angola – the most important coffee-producing colony of the Portuguese empire – produced Robusta, a coffee species essentially resistance to this rust?

Firmly rooted on CIFC' s correspondence and documentation provided by American archives, this paper portrays CIFC as an output of US imperial aspirations. It describes it as part of a global plan designed by American plant pathologists to protect American coffee production – a plan that had begun in Latin America and was gradually expanding to the old colonial world. Moreover, it shows how CIFC also responded to national and imperial interests of Salazar's regime, soon under the fire from the international community. This paper is not about the impact of a plague or new cultivar. It's a story about an *idea* of a threat and how political, economic and even epistemological wedges, separating the 'free world' from authoritarian and colonialist Europe, were bracketed, under the sign of 'scientific cooperation'.

Session: Problematizing Transnationalism: Center/Periphery Relations in International Environmental Science Programs, 1945-2002

MODERNIZING PORTUGUESE CHEMISTRY IN LATE 19TH CENTURY THROUGH A TRANSNATIONAL NETWORK

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Abstract

By mid-19th Century, it became apparent that, in order to raise the level of teaching and practicing Chemistry in Portugal, a closer contact was needed with the main centres, where new chemical knowledge was being created and developed. Scholars were sent mainly to France and Germany, who upon their return updated the content of their lectures, modernized their laboratories and became active in research, as well as in offering services to the community or by becoming industrial entrepreneurs. The Lisbon Polytechnic School and the University of Coimbra also hired some foreign chemists, who influenced such activities as carriers of tacit knowledge and even of laboratory equipment. During the decades of 1860 and 1870, a network of transfer of chemical knowledge developed. This involved French laboratories and, to an increasing extent, German universities. Until recently, only a small part of this network was known. Recent investigations into the biographies of some of the less known chemists from France and mainly Germany who came to Portugal, allowed to discover the criteria and methods of recruitment of these chemists, most of which returned to their home countries after one to six years after their arrivals. In spite of the brevity of their stays, they left important footprints in Portuguese Chemistry. In some cases one can even speak of knowledge circulation, because research done at the Lisbon Polytechnic School was published in France and Germany and thus there was some return of knowledge from the periphery to the centre. Citation records of these publications illustrate the reception and appropriation of some of their contents.

Session: Problematizing Transnationalism: Center/Periphery Relations in International Environmental Science Programs, 1945-2002

SCIENCE FOR PEACE: BUILDING POSTWAR SCIENTIFIC ECUMENISM AT UNESCO, 1946-1954

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Abstract

In the late 1940s, UNESCO committed to the reconstruction of international science. Rather than proceeding to the mere reactivation of interwar networks, the UNESCO Natural Science (NS) division intended to rebuild on new foundations.

Under the impulse of biochemist Joseph Needham, the NS division attempted to enact a truly globally inclusive network of scientific cooperation. With the International Science Program, the NS division aimed to create a better world by liberating science's full potential. International science was then seen as a powerful tool to reinforce peace and address mankind's most pressing needs. Yet, interestingly, the promises of science could only be met for the NS division, once all scientific communities and traditions would be empowered to work together. In other words, it heavily – and unprecedentedly – relied on cooperative models aiming at a better inclusion of the so far marginalized peripheral communities. The UNESCO international science program thus intertwined new conceptions of science with new forms of cooperation, which were ultimately imagined to enhance the periphery's participation to world science and address its pressing – social and scientific – needs.

The program's ideals were swiftly put to practice with the inauguration of two field-projects: the International Institute for the Hylean Amazon (IIHA) and the International institute for the Arid Zone (IIAZ). While the IIHA studied tropical environments and the IIZA investigated the world's arid zones, both operated in and principally with the South. While explicitly contesting inherited centre/periphery dichotomies, the program eventually experienced an ambivalent fate, by being partly rejected by those it intended to empower.

In this paper, I investigate the program's new global imaginaries of scientific cooperation by emphasizing on the modalities of the periphery's inclusion. I intend to contrast ideals with practice to highlight the program's relative failure and the reasons for the periphery's withdrawal. of the IIHA project.

Session: Problematizing Transnationalism: Center/Periphery Relations in International Environmental Science Programs, 1945-2002

NETWORKING NATURE: CENTER-PERIPHERY RELATIONS IN NATURE CONSERVATION IN THE INTERNATIONAL BIOLOGICAL PROGRAMME (1964-1974)

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Abstract

In the 1960s and 1970s ecology went global. The emergence of a great variety of new environment-related transnational agencies and projects created novel global spheres of action for scientists of the young discipline of ecology. These developments were paralleled by an increasingly 'global' rhetoric in nature conservation and ecology. Around 1970, the rise of the ecological concept of the biosphere, denominating all living spaces on the earth's surface and inside its waters, epitomized the reconceptualization of the environment as one complex and confined ecological mechanism surrounded by uninhabitable cosmic space. The global ecosystem, which according to biospheric thinking required protection in its entirety, offered a new spatial dimension for organizing ecological work. Yet, after a long tradition of nature protection in particular areas in the global South, in fact how international were these environmental endeavors?

In this paper, I investigate the alliance building practices of conservation experts in ICSU's International Biological Programme (IBP), the first international environmental science program (1964-1974). Particularly, I look at how the constellation of ecologists' global network within IBP influenced the creation and reinforcement of centers and peripheries in conservation. In a post-war spirit of big data programs and international science projects, the members of IBP's conservation section envisioned a global survey of ecosystems and their need for protection. However, in this paper I will argue that rather than internationalizing nature conservation, the scientific networks IBP drew on consolidated the emphases on particular areas already protected. In this process, the new concept of the ecosystem merely added another rhetorical layer for conservationists to justify their spatial foci.

Session: Problematizing Transnationalism: Center/Periphery Relations in International Environmental Science Programs, 1945-2002

A PROSOPOGRAPHY OF CONSERVATION EXPERTS IN THE ERA OF "SUSTAINABLE DEVELOPMENT" AND "BIODIVERSITY", 1972-2002

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Abstract

Before the 1970s, international nature conservation was predominantly an affair of European and North American males with a preference for birds and 'charismatic megafauna' from Africa. The UN Conference on the Human Environment in Stockholm (1972), however, gave experts from less developed countries an opportunity to voice their concerns on the international stage. As a result, Stockholm introduced a new paradigm to the international conservation community, which integrated the preservation of wildlife with issues of social and economic development. 'Conservation for development', then, became the dominant framework within which IOs like IUCN and UNEP discussed nature conservation issues in the 1980s. One decade later, after long and difficult negotiations between developed and less developed countries, Stockholm's predecessor - the UN Conference on Environment and Development in Rio de Janeiro (1992) - added another concept to the conservation for development paradigm: 'biodiversity', which became the new buzzword to frame issues in the 1990s.

By using an extensive prosopographical database, this paper will investigate how the social, geographical and intellectual background of nature conservation experts changed after Stockholm. I will argue that the ideas of 'conservation for development' and 'biodiversity' helped dissolve ethnic centre/periphery dichotomies in the 1980s and 1990s. In addition, the two paradigms provided all kinds of opportunities for scientists, both from developed and less developed countries, with specific 'peripheral' expertises and contacts.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Scientific Concepts In The European Periphery

This panel invites scholars and case studies from various areas of history. The papers are encouraged to take advantage of the theoretical and methodological tools developed by the History of Concepts. Since the late 1960s historians of concepts' wide and multifarious agenda was primarily connected with the history and philosophy of political thought. Lately, history of concepts started tightening its interconnections with other areas of history, and in this process it crossed paths with history of science. In this new context an attempt was made by historians to study the scientific concepts with regard to other disciplines of the humanities, such as social history, social anthropology, history of medicine, history of political thought and others. At the same time, the European periphery, due to its wide spatial and temporal diversity, became an advantageous field for implementing the tools of History of Concepts. The panel aims at exploring the advantages that this unique convergence can offer to the history of scientific concepts, as well as to the study of the European periphery as a knowledge-shaping terrain. In other words, the panel offers the opportunity for a fruitful discussion about the formation of scientific concepts in the multicultural and multilingual contexts of the European periphery by emphasizing the advantages of the convergence of History of Science with History of Concepts.
The case studies should include, but not be limited to the following:

- Concept-shaping, transfer and conceptual transformation.

The fact that concepts are not stable units is well-established nowadays. What does this mean in the context of science, technology and society? How can the study of concept-shaping in local level and the transformation of concepts across borders contribute to the study of the "development" of various "scientific" concepts?

- Moving concepts: Centers and Peripheries. The linguistic and cultural diversity is the main characteristic of the European periphery. Moving concepts and their translation is a central theme of the "Center-Periphery" scheme: How can a historical study of these phenomena contribute to revising this scheme? How translation affects the moving concepts and how does it contribute to their domestication? How the local appropriation of a concept affects the "original" concept? Do scientific peripheries affect scientific centers through translations?

- Studying concepts in different linguistic/historical/geopolitical contexts.

Placing concepts to their linguistic and historical contexts is not something new; it is rather a tradition that can be traced back to the mid-20th century. How can the study of contexts themselves contribute to the discussion of concepts? How can the comparative studies of different contexts enrich the history of concepts? How can comparative studies be enriched by the methodological tools elaborated by the History of Concepts?

Session: Scientific Concepts in the European Periphery

THE CIRCULATION OF KNOWLEDGE AND THE PRACTICE OF TRANSLATION IN THE LATE 18th CENTURY GREEK-SPEAKING REGIONS

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Abstract

In the 18th century, the intellectual activities of the Greek-speaking populations took place in the general context of the social and political reformations of the declining Ottoman Empire. Any assimilation of ideas has to be interpreted in light of the local social and intellectual conditions. According to the History of Concepts, a historiographical tradition mainly derived from the intersection of anthropology, linguistics and political history, no political action, no social behavior can occur without the establishment of a common stock of concepts. The practice of translation, by interfering in this process, crucially affects the encounter of different cultures.

The Philosophical Grammar, Being a View of the Present State of Experimented Physiology, Or Natural Philosophy (1735) by Benjamin Martin was translated into Greek by Anthimos Gazis in 1799. The translation of the original text was enriched with the addition of many notes and annotations by Gazis himself. The study of the paper will focus on the social, political, theological and intellectual conditions of the period Gazis' work was published: Why was this text important and how the natural philosophical knowledge was presented in the translated work? How did Gazis interact with the appropriated philosophical knowledge? How did he participate in the reshaping of the Greek intellectual life through the act of translation? How did his translation contribute to the construction of an appropriate conceptual framework for the reception of modern science?

By bringing together History of Science and History of Concepts, this paper focuses on both the study of the assimilation of the philosophical theories by the Greek-speaking scholars and the historicization of their projects by placing special emphasis on the translation and the formation of specific concepts with respect to the local political, social and religious traditions.

Session: Scientific Concepts in the European Periphery

EXPLORING CULTURAL DIMENSION OF THE CONCEPT OF TECHNOLOGY IN THE RUSSIAN LANGUAGE

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Abstract

The paper looks at the history of the concept of "technology" in the Russian language and the scope of meaning it acquired in the course of time. The focus of the research was on the functioning of the concept in scholarly, public and political discourses and its ability to express the ideas exceeding the limits of technical scope, and on the interrelation of the ideas of technology and culture. A closer look at the historical collisions of the concept provides an insight into how emerging meanings of the concept are tied to political and social events and practices.

The paper outlines on the history of the concept from its advent in the XVIII century through the XX century. The most important periods in the history of the concept were the end of the XIX century – beginning of the XX century when the term entered into a rivalry with a number of philosophical categories and "won" the competition; during the Soviet period the concept enriched semantically, gained new semantic perspectives. The concept was used frequently in 1920s-1930s, than it disappeared from the scene to enter the language anew in 1950s – beginning of 1970s with novel connotations. I argue that the attitudes towards the concept in the XX century may be explained by an "Americanized" nature of the term, and referred to American technological power and experience.

The methodology of the research was inspired by Conceptual History (Reinhart Koselleck), a discipline sensitive for the logic of conceptualization changes in the process of modernization. It was also productive to treat the advent of the concept and its functioning in the light of the idea of cultural transfers (M. Espagne).

Session: Scientific Concepts in the European Periphery

FACING ASSYMETRY – NORDIC PERSPECTIVES ON TRANSNATIONALISM IN INTELLECTUAL HISTORY

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Abstract

Cultural asymmetries and center-periphery dynamics play a crucial role in the lives and careers of small country intellectuals. In a culture that conceives of itself as peripheral, there is a strong notion that the "real" discussions are taking place elsewhere, and that any ambitious scholar, writer or intellectual need to approach the cultural centers in order to develop professionally.

This paper addresses the role of asymmetry in the interaction between intellectual fields in Europe in the late nineteenth and early twentieth centuries from the perspective of the Nordic peripheries. By focusing on the spatial and temporal hierarchies implicit in the way Nordic intellectuals perceived and made use of backwardness, our aim is to bring a peripheral perspective to the discussion on transnational intellectual history. This is important because, to our mind, the discussion on cultural transfers has focused on notions like reciprocity and hybridity which tend to paint a too harmonious picture of international cultural space, reproducing the ideal of a borderless and equal republic of letters.

The peripheral position perhaps generally a nuisance, but it can also be turned into an advantage. Constantly following foreign discussions, intellectuals from the peripheries are wedged in a perpetual process of translation and appropriation. This makes them less prone to fall into universalistic modes of thinking, believing that concepts or ideas are universal. Indeed, from the periphery easy to recognize the fact that there are different centres and universalisms. Therefore, the peripheries can have an important role in furthering a common European intellectual space.

Session: Scientific Concepts in the European Periphery

SOME ASPECTS OF LEGACY OF ALEXANDER VON KEYSERLING AND BORIS NURMISTE

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Abstract

The scientific legacy of Baltic German Alexander Friedrich Michael Lebrecht Arthur Nicolaus James Graf von Keyserling (1815 - 1891) is large and diverse. However, in his work *Note sur la succession des etres organises* (1853) he came close to the ideas, which are currently known as 'horizontal gene transfer'. Keyserling suggested that there are small germ-like molecular particles, which are able to migrate from organism to organism and infect them in the same manner as the viruses or plasmids do. He also believed that those molecular particles play a significant evolutionary role as the main reason for the phenomenon, which we know nowadays as 'genetic variability'. This was the reason why Charles Darwin mentioned Keyserling in the preface of his book *The Origin of Species*. The presentation examines the views of Alexander von Keyserling and Boris in the context of his time and in respect of the theory of horizontal gene transfer, which occurred in the second half of 20. century.

Estonian scientist Boris Nurmiste (Neuhaus) (1907 – 1996) came out with another interesting idea. Already in 1960ies he, based on his own observations, suggested that some of the viruses are apparently able to stay inactive and passively replicate themselves by the replication of their hosts and pass thus on to offspring (new generations) of the cells they originally infected. Nowadays this theory is known as 'provirus' or 'endogenous virus' theory and proved by numerous cases during his life time.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Peripheral Mobilities, A Viable Concept?

Mobility History (as a history of transport and communication, of the movement of messages, goods and people) has largely been conceived and practiced within a Western paradigm, and if non-Western perspectives were integrated, they were often of a diffusionist nature, describing the spread from the core and the local adjustment during the appropriation process.

But what if we turn around our perspective? What if we leave the Western master narrative and start from the non-West? What would happen to this subfield if we would acknowledge that walking, cycling and plain talking are still statistically the world's most wide-spread 'modalities'? What would be the consequence of taking the pleas of activists in India seriously, who refuse to bow for traffic engineering's devastating flow fetishism resulting in the creation of fly-overs and the destruction of a rickshaw culture that provided a livelihood to thousands of urban poor? How would a 'world history of road motorization' look like in countries and continents with a weak central state and an absent middleclass? And what would happen if we re-unite media and transport history after a century of fateful separation, and integrate the mobile telephone in our analysis of global motorization, or the telegraph, the railways and shipping in the second imperialist project around the turn of the twentieth century? Such questions govern the presentations suggested in the session proposal.

Session: Peripheral Mobilities, a Viable Concept?

MOTOR INSURANCE AND MOBILITY IN PERIPHERAL SPAIN SINCE 1960 UP TO 2000

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Abstract

Mobility is a brood concept; I am going to focus only in motor insurance in this paper. And it will be in a country that is peripheral from the core countries in West Europe. Spain started to grow fast since the second half of the XX Century and will succeed an important caching up. Even if the most important insurance today is life insurance, in the 60s, in Spain and up to the 90s was motor insurance. People started to have this insurance, before only the wealthy people had insurance, life insurance, or fire insurance for the buildings, when the people living in those building were relatively rich.

The factor that made so relevant the car is that the great majority wanted to buy one. This is the beginning of the benefit but also the problem. Why is it a problem?, first the roads had to be prepare for the vehicles in fast increase, second the cars had to be prepare to avoid accidents, for example developing better breaks and also as important as the other, it was necessary to educate the drivers, all of us know that speed kills, but many do speed and of course die a good number.

In short time from few cars we go to millions and accidents were very common and death in the road is something that happens each day. In fact we have a serious problem because a large number of people die in our roads.

The process of introducing motor insurance in Spain has a big moment when the law made it mandatory, in 1965. Any person driving a car had to have a minimum insurance that is third party. In Spain they have a strong mercantilist thought; the State that pushes the economy and in this case the insurance market. Nonetheless a large number of insurers will be insuring full risk.

Session: Peripheral Mobilities, a Viable Concept?

A NEW CORE AND NEW PERIPHERIES: THE ROLE OF TELEGRAPH UNION (1865-1914)

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Abstract

On the 17 may 1865, after two months of meetings, ITU was instituted in Paris by twenty European countries. It was the first supranational organization and, in particular, the first supranational organization to supervise and rule an international public service. The Union had an extremely modern administrative structure, based on periodic bodies (the Conferences) and a permanent body (the International Bureau of Telegraphic Administrations). In other words, the Telegraph Union "invented" the structure that all the international organizations have later adopted and still have today: 1) a secretariat able to constantly communicate with all the members; 2) plenary conferences able to establish common rules.

Between 1865 and 1875, plenary conferences and the permanent body shaped the international telegraph network determining: 1) standard technologies of communication; 2) rules shared by all the countries; 3) common tarrifs and anti-dumping-rules; 4) common technical culture. These items were the results of some political, social and cultural decisions taken by diplomats and telegraph service directors which participated actively to the conferences activities. These international "constitutive choices" shaped a new core/periphery. For example, in 1868, the ITU Conference decision to introduce an anti-dumping rule supported the existing (public) lines and creates an apparent disadvantage to new (and private) lines. Beside this rule limited the building of new international lines and brought to a conservative model of network (and to the conservation of this new periphery/core dichotomy). How much this new dichotomy is influenced or shaped by the emerging of a new dichotomy in the national realities? Who and why shaped this international dichotomy? Finally, how much the international network shaped and influenced the management and the building of national networks?

Session: Peripheral Mobilities, a Viable Concept?

THE SCIENTIFIC INTERNATIONALISM OF THE BRAZILIAN PHYSIOLOGIST MIGUEL OZÓRIO DE ALMEIDA (1920-1940)

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Abstract

The goal of this work is to analyze how the "ideology of scientific internationalism", which marked the international debates between 1920 and 1940, was appropriated by the Brazilian physiologist Miguel Ozório de Almeida in order to justify and sustain closer scientific relations between Brazil and other countries and the development of its intellectual life. In addition, I reflect on the relationship between this internationalist dimension of scientific work and the universalist conception of knowledge defended by Miguel Ozório de Almeida.

This was a time marked by debates on the neutrality of science and the engagement of scientist/intellectuals in the public arena. So, I analyze Almeida's views and positions as an intellectual, keeping in mind his defense of science as a decisive factor in constructing the Brazilian nation, as well as a model for politics and international relations.

The main research questions are: In which ways did the insertion of this scientist in the national context shape his speech and action at international debates about intellectual cooperation? And to what extent did the ties with international organizations (such as the League of Nations) and the international scientific community validate this scientist's interventions in the national public scenario? In what way does Ozório de Almeida's defense of scientific internationalism point to a personal strategy to make himself heard (in the international scientific community as well as in Brazilian politics), and inform us about the concepts of science that he shared with other scientists of that time?

Session: Peripheral Mobilities, a Viable Concept?

THE DEVELOPMENT OF EARLY TAXICABS IN LISBON (1906-1910): TECHNOLOGICAL, SOCIAL AND GEOGRAPHIC CONSTRAINTS

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Abstract

Unlike the west big European cities, Lisbon didn't use the electric engine for its cab automobile fleet in the end of the 19th century. Furthermore, at that time, the petrol engine was actually considered unreliable for heavy duty purposes, so horse cabs remained competitive and affordable for passengers and also for business people in urban travelling. In fact, for some years, all railway passengers coming to main stations of Portuguese capital city were obliged to use horse cabs in order to arrive faster to their destination. However, the increase of petrol engine cars reliability and the birth of several well succeeded experiences on Paris using that technology lead some Portuguese entrepreneurs to ask for prefecture taxicab licenses for motor vehicles, from 1906 onwards.

The Lisbon motor taxicab fleet was relatively small compared to other large European cities due to a large set of constraints. Social wise, the costs were affordable only to an elite group but, on the other hand, motorists have poor training and low wages. Technologically, Lisbon was also a challenge due to the slopes of the hills and some preposterous brick streets, demanding for engines with better torque but necessarily with higher maintenance values, increasing running costs of the operation and potentially reducing its profitability.

In this work we will list the main historical topics of the development of early taxicabs in Lisbon, between 1906 and 1910, and we analyze the several constraints responsible for its slow growing in that particular period.

Session: Peripheral Mobilities, a Viable Concept?

COLONIAL ROADS IN ANGOLA AND MOZAMBIQUE – EXPERTS BETWEEN PERIPHERIES AND CENTRES

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Abstract

Scholars within the STEP network have proposed that, regarding technological and scientific peripheries, there should be a greater emphasis on the history of appropriation, which means considering the receptor environment active and acknowledging the point of view of the receivers, and studying this history through its conflicts, namely those caused by different agendas of the actors (political, technical, and others). [1] How does this concept might have worked in a European periphery, such as Portugal, in its relation, as a centre, to its former colonies of Angola and Mozambique? We answer this question by following road engineers from the metropolis in their technical missions to these African peripheries, and how they adapted their discourse on traffic engineering and economic development to a discourse on the "economic roads" to be built in the colonies in the 1950s. By taking this approach we aim to challenge the concept of appropriation and apply it to the mobility realm, bringing also an interpretation of the dynamic relation between centres and peripheries.

[1] Kostas Gavroglu *et al.*, "Science and technology in the European Periphery: some historiographical reflections", *History of Science*, 46, no. 152 (2008). On the concept of appropriation see also Thomas J. Misa e Johan Schot, "Introduction. Inventing Europe: Technology and the Hidden Integration of Europe", *History & Technology*, 21, no. 1 (2005).

Session: Peripheral Mobilities, a Viable Concept?

AN EXTRAORDINARY BENEFIT TO US: BICYCLES, AUTOMOBILES, AND DREAMS OF PERSONAL MOBILITY IN POLAND, 1885-1939

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Abstract

In 1899, the Varsovian civil engineer Emil Sokal wrote “in the West, they maintain that time is money; here it seems that time still has little value, yet there will come a time of change when rapid locomotion will prove [invaluable, and] the automobile will become an extraordinary benefit for us by replacing the train in many instances, serving as a main station at one’s front door.” Sokal’s enthusiasm for the automobile was much like the famed writer Bolesław Prus’s fervor for the bicycle some eight years before, when he gushed that the bicycle was a “miracle in an age that [did] not believe in miracles,” a literal vehicle for personal and national regeneration. In their enthusiasm for the new superlative machines of the age, Prus and Sokal were not that different from educated observers elsewhere, though both of them sensed that their society was somehow behind and they therefore placed greater hopes in the power of these new machines to help propel them forward. When, after a period of initial enthusiasm neither machine enjoyed the widespread adoption that they experienced in much of France, Germany, Great Britain or the United States, Polish enthusiasts were apt to be disappointed. This paper will explore the adoption and promotion of bicycles and automobiles in Poland from their introduction in the late nineteenth century until the 1930s by looking at cycling and automobile clubs, specialty publications, and secondary sources about their adoption, stressing the pattern of dreams for the future, followed by the realization that the best most could do was to go along for the ride.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Experts in the Periphery: Governing Techno-sciences and Societies from the 19th to the 21st centuries

In recent years an increasing number of studies in history of science have focused on the definition and the role of experts in modern western societies, where expert advice is broadly employed in the fight against the disease, the prosecution of criminal activities, the development of military industry, the control of food quality and the regulation of industry, among many others. General books with reviews and theoretical proposals have been published (Golan, 2004; Collins-Evans, 2007) and the interest in the subject is easily perceived by the growing number of publications that have appeared in history of science journals (Social Studies of Science, for instance), the Isis focus on "Science and Law"(2007) and the more recent volume Forensic Cultures (2013), a special issue of Studies in the History and Philosophy of the Biological and Biomedical Sciences. Some of these publications and collective volumes were conceived or discussed in international workshops organized in Oxford, (October, 2005), Philadelphia (April 2006), Hull (September 2009), Manchester (June 2010), as well as the STEP workshops in Valencia (December 2011) and in Corfu (June 2012, 8th STEP meeting).

Recent approaches in the role of experts in the making of sciences and technologies have shown and argued in favor of an understanding of the experts' functions as mediators either between the general public and the government (regional, national, international) or between the public and the corporate and Industrial world. In more sociological terminology we would say that the experts are actors with hybrid epistemological, cognitive and social identity pertinent and flexible enough to be able to form and shape 'trading zones' where new knowledge, policies and social roles are formed. New historiographical and sociological studies have stressed that mediating actors form regimes of scientific and technological knowledge pertinent to the policy making procedure. An epistemological genre called 'civic epistemology' is emerging through the agency of historical actors like experts. Experts self- fashion the role of intermediaries between power and people and thus in many

Cases represented their practice and their communities as substantially important in the construction of a stable, modest and consensual society. Yet still the historical works have stressed the performative dimension of the function and role of the techno-scientific professionals as well as its precarious social and epistemological status. Emphasis has been given in the co-construction of society, regional society, communities and techno-sciences and techno-scientific politics and policies.

General Research Questions of the Sessions

How experts did function in local and institutional settings and contributed in the appropriation of techno-sciences in European peripheries? What was the role of techno- scientific experts in governing technologies and sciences in the making? How the politics of expertise was experienced in different and multiple contexts? How expert networks and techno-scientific expertise were shaped within local contexts and different cultures of social distinctions and social hierarchy? How forensic cultures constrained the role of experts in different legal environments?

Note: The following organization of the subsessions is just a tentative proposal. The definitive organization will be settled according to the guidelines of the organization of the STEP meeting (for instance, maybe two subsections of two papers will be merge into a session of four papers depending on the timetables and so on). Please, feel free to make any suggestion for that matter. We plan to have a commentator for every session and papers will be precirculated.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

EXPERTISE AND COLONIAL MANAGEMENT OF PLANT GENETIC RESOURCES IN THE WEST INDIES

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Abstract

Intellectual property in biological objects is the foundation on which much of the profitability of the modern biotech industry rests. Yet the ascription of intellectual property to the biological relies on a complex set of practices for collection, classification and distribution of plant genetic resources. This paper focuses on the historical development of these practices as a key area of interaction between legal and non-legal, entrepreneurial and government-sponsored regimes of ownership and control of genetic resources.

In the nineteenth and twentieth centuries networks for the collection, cataloguing, sale and exchange of plants proliferated around the globe. The British Colonial Government was a key player in this web. It sponsored – through Royal Charter – a network of Royal Botanical Gardens, charged with collecting and sending samples back to Kew Gardens in London and to the other British colonies' botanical gardens. The role of government (and not just the British one) in such networks is relatively well known, although much detail remains to be uncovered. What is virtually unknown is the role of individuals and entrepreneurs. To take one example, in 1888 the Kew-trained botanist Walter Elias Broadway arrived in Trinidad and Tobago to take up the newly created role of Assistant Superintendent of the Royal Botanic Garden. This role was a central part of the colonial service's mission in T&T. However, Broadway fought with his supervisor John Hart and the turn of the century found him in Grenada curating the island's botanic gardens but supporting his heavy drinking habit by selling plant specimens to public and private herbaria and collections around the world. In 1904 Broadway retired, only to come out of retirement in 1908 to take up the acting curatorship of the Botanic Station in Tobago where he worked, once again, for the colonial services.

Individuals such as Broadway played an important role in spreading genetic resources around the world; recovering their stories helps us to understand how, for example, bananas came to be a staple of Queensland agriculture. Broadway's career was a microcosm of the mixed ecology of plant breeding in his period, encompassing commercial and civil service sponsored plant collecting and distribution. Stories such as Broadway's are therefore equally valuable to understanding how expertise was generated and maintained in diverse contexts.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

AGRICULTURAL ENTOMOLOGISTS IN SOUTH RUSSIA: THE MAKING OF A NEW SCIENTIFIC DISCIPLINE AT THE PERIPHERY

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Abstract

An increasing awareness of the complex links between environmental sciences and economy prompts scholars to explore the role of naturalists as governmental experts and public advisors. The use of 'experts' as the key conceptual category substantially altered the research agenda by problematizing the boundaries between these people and their lay audiences. In the early modern Europe, the pursuits of natural history were not easy to disentangle from practical economic improvement. It was only in the course of the 19th century when the division between practical and theoretical knowledge became a constitutive feature of modern natural sciences. A rapid expansion of educated public created sufficient status anxieties among university-educated researchers to make them invent this new conceptual category in order to draw a distinction between themselves and lay audiences.

These processes, however, must have been very different in the European periphery where a slow advancement of print culture hampered the expansion of educated public. In the case of the Russian empire, we still know very little about the circles who did not explicitly belonged to the academic milieu and who, nevertheless, were involved in debating various environmental issues that caused considerable governmental and public concern in the first half of the 19th century.

The paper focuses on the debates on insect pest outbreaks and climatic impact of forests. A comparison between the two streams of debate enables us to differentiate between the fields dominated by state institutions with an early introduction of formal credentials, and those where local knowledge continued to play an important role in defining expertise. We will examine: (1) social and epistemic identities of experts, their sources of credibility; (2) the role of lay public in the making of observational evidence, the interaction between experts and lay public; (3) the links between modern state building and expert identities.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

ENGINEERING EXPERTISE, INFRASTRUCTURES AND TECHNO-POLITICS IN COLONIAL CYPRUS

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Serkan Karras, University of Athens
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Abstract

The paper studies the role and agency of British engineers in large scale infrastructures in the island of Cyprus during the colonial period. Throughout the colonial period (1870-1960) the colonial administration emphasized on the importance of infrastructures in establishing and extending further the political power of Britain. Cyprus was allocated £10millions from the CDW Act 1945 mostly for welfare and agricultural expenditure by Her Majesty's Government. The local Government would add more millions in London stock loans to engage in allegedly ambitious infrastructure projects like Island-wide electricity grid, Cyprus Airlines and airfield, road networks and two deep-sea ports.

Experts, in this context, frequently visited the Island. Their arrivals and reports even met with great public interest, protests and anger. In the post-war period, in the cases of electrification and harbour construction particularly, the schemes happened to be identified by the name of their designers, the British experts sent for survey and report. Since the schemes and their designs and visions were put under scrutiny and became matters of anti-colonial politics and geo-strategy, the experts found themselves involved in the disputes, confronting the people as in the case of electrification. British colonial technocracy was being challenged not on grounds of technical competence or cognitive reasons but on grounds of legitimacy of the regime. In this context the politics of expertise was part of the techno-politics of the Island.

British engineering expertise was part of the political agenda of the colonial administration that prioritized the struggle against the anti-colonial Greek/Turkish nationalisms. The authority of British engineers and their technocratic status were stressed by the colonial administration in its attempt to bypass any local criticism and alternative schemes. It was thought that technical solutions introduced by authoritative experts could be socially legitimized easily by the natives whilst in the same time it promoted British colonialism. In the same time British technocrats had to work and submit their plans and designs within a specific social, economic and geo-political context. Their consulting advice and technological solutions had been adjusted through a process of continuous negotiations and interactions with the localities. Thus there was a continuous process of coproduction of expert advice and the legitimate technological solution with the technological policy and the formation of the local techno-politics and the colonial regime in the island.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

ACADEMICS, BUREAUCRATS AND LOCAL FOLK: DEFINING ENVIRONMENTAL EXPERTISE IN THE EARLY 19TH CENTURY RUSSIAN EMPIRE

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Abstract

An increasing awareness of the complex links between environmental sciences and economy prompts scholars to explore the role of naturalists as governmental experts and public advisors. The use of 'experts' as the key conceptual category substantially altered the research agenda by problematizing the boundaries between these people and their lay audiences. In the early modern Europe, the pursuits of natural history were not easy to disentangle from practical economic improvement. It was only in the course of the 19th century when the division between practical and theoretical knowledge became a constitutive feature of modern natural sciences. A rapid expansion of educated public created sufficient status anxieties among university-educated researchers to make them invent this new conceptual category in order to draw a distinction between themselves and lay audiences.

These processes, however, must have been very different in the European periphery where a slow advancement of print culture hampered the expansion of educated public. In the case of the Russian empire, we still know very little about the circles who did not explicitly belonged to the academic milieu and who, nevertheless, were involved in debating various environmental issues that caused considerable governmental and public concern in the first half of the 19th century.

The paper focuses on the debates on insect pest outbreaks and climatic impact of forests. A comparison between the two streams of debate enables us to differentiate between the fields dominated by state institutions with an early introduction of formal credentials, and those where local knowledge continued to play an important role in defining expertise. We will examine: (1) social and epistemic identities of experts, their sources of credibility; (2) the role

of lay public in the making of observational evidence, the interaction between experts and lay public; (3) the links between modern state building and expert identities.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

STATISTICAL EXPERTISE IN AGRICULTURAL RESEARCH

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Abstract

Since the early decades of the twentieth century statisticians became consultants in the design and analysis of experiments in agricultural science. With their expertise in mathematics, computing and data management they contributed to increase the accuracy of agricultural experiments performed in fields and laboratories.

Rothamsted Experimental Station, the oldest British institution for agricultural research, had a pioneering role in this effort. The first statistician hired by the station, Ronald Aylmer Fisher, developed during the 1920s the statistical methods of analysis of variance and experimental design, which reshaped the practices of agricultural experimentation during the twentieth century.

The statistical expertise nurtured at Rothamsted did not remain confined there. Several visiting workers came to Fisher's department to learn analysis of variance and experimental design and the connections of Rothamsted with scientific institutions located all over the world promoted the diffusion of statistics in agricultural experiments.

The paper will address the dissemination of statistical expertise in agricultural research, investigating the spread of analysis of variance and experimental design from their birthplace, Rothamsted, to the experimental stations and the food processing industries located in the peripheries of the British Empire. It will take into account institutional and scientific actors, the networks of knowledge exchange already existing in agricultural science, and the trade- off between the data supplied by the institutions in the peripheries and the statistical expertise, which Rothamsted Experimental Station could offer.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

'THE HOUSE OF MURDER': THE CHRISTIE INVESTIGATION AND THE EMERGENCE OF THE FORENSIC 'TEAM' IN POSTWAR ENGLAND

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Abstract

This talk uses the notorious 1953 case of the serial murderer John Reginald Halliday Christie to explore the contours of English homicide investigation at mid-century. It forms part of a broader historical study of twentieth-century English homicide investigation, which is organised around two main strands: first, developments in techniques and working practices of forensic pathological investigation; and second, developments in crime scene investigation driven by forensic science. Its working hypothesis is that, over the course of the century, the latter model of trace-oriented and team-driven investigation made inroads into the status of the pathologist. However, the study does not seek to tell a linear story, in which a forensics of bodies was ultimately eclipsed by a forensics of things. Instead, it sees the relationship as better characterised as a dynamic interplay between two sets of practices, personnel, and spaces.

The paper will focus on the variety of sites and agents of knowledge production and the way that these interacted in order to delineate the broader 'forensic culture' within which Christie investigation unfolded. At the centre of the case stood a house: 10 Rillington Place, a dingy Victorian tenement in a non-descript Notting Hill cul-de-sac. The probing of this space by investigators transformed it into a macabre excavation site, in which a forensics of bodies and things were thrown together in a collaborative exercise. Crucial to the Christie story is the way that forensic pathology and forensic science operated in a relationship of mutual dependence, and how this reflected an effort on the part of participants to forge a new culture of 'team-driven' forensic investigation as a self-conscious corrective to a prior model based on individual 'virtuosity.' In particular, the Christie case enables an examination of the ways that English murder investigation was shaped by new approaches to the crime scene and by developments in lab-based analysis of crime scene objects which reconfigured the relationship between bodies, spaces, and traces.

Focusing in detail on the recovery and analysis of bodies and traces enables us to see how multiple elements of forensic inquiry interacted to generate knowledge from their prolonged, meticulous, and intensely public search for forensically actionable evidence in and around the material world of Rillington Place. Through an analysis of the investigation of Christie's house, the paper seeks to show how the murder scene fused – physically and imaginatively – post-war forensic inquiry into a collaborative endeavour, and in the process provided a spectacular demonstration of the interpretative powers of 'modern' CSI.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

POISONS AND EXPERTS ACROSS BORDERS: TOXICOLOGY IN NINETEENTH- CENTURY SPAIN

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Abstract

Many nineteenth-century Spanish toxicologists and forensic doctors strongly criticised the lack of a clearly defined group of experts, which could be addressed by judges during a criminal case, more specifically in those involving poisoning. Critics primarily pointed out two issues: the variety of professionals who acted as experts, and the lack of resources available to prepare expert reports. The Catalan toxicologist Pere Mata i Fontanet (1811- 1877) was one of the authors who advocated for the creation of a special body of medical examiners that could participate as experts during poisoning trials. Mata stated that many poisonings went unnoticed in Spain due to the lack of knowledge of the persons initially in charge of examining these cases. This explained, as he pointed out, why these crimes didn't reach as high of a number of cases as those produced in other countries. It was not until 1843 that a chair on legal medicine and toxicology was created, and Pere Mata played, as well, a major role in the university reform. Pere Mata's character is a perfect example to observe the development of an expert in the periphery. He was the author of the most influential Spanish treatise on legal medicine and toxicology, which had six editions but was never translated. He even claimed that any other author abroad had been able to write a treatise as complete as his. His treatises did not include experimental results but rather a rhetorical discussion and a place where he could claim for changes to be made in those new sciences. His participation in famous trials, such as the poisoning case of Maria Bonamot, which is the focus of my research, only contributed to increase his claimed authority as an expert. I argue that it was precisely, during those trials, when experts had to face the puzzling questions of lawyers and jurors, that toxicology was built. However, Mata remained as an invisible character outside Spanish borders, pointing out that the strategies employed to became an expert in the periphery may differ from those that are necessary to cross borders.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

A MORTUARY WITH A VIEW: THE CRUMBLES BUNGALOW MURDER AND THE SPECTACLE OF INTERWAR ENGLISH HOMICIDE INVESTIGATION

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Abstract

Focusing on English homicide investigation in the mid-1920s, this paper explores the vicissitudes of expert authority and knowledge-claims involved in the creation, harvesting and management of a crime scene, its public imaginings, and its interpretation and articulation in the courtroom. My discussion examines the 1924 murder of Emily Kaye by Patrick Mahon in an Eastbourne beach bungalow. At the centre of the case was a dismembered and mutilated body, whose remains were embedded within and scattered across the material fabric of the holiday cottage.

My line of argumentation will be two-fold. First, I will examine how the gruesome case not only gained notoriety in the public imagination but also it marked a watershed moment that, in many respects, heralded the arrival of our present-day, trace-centred model of 'Crime Scene Investigation' (CSI). In showing this, I will detail how police investigators, physically and imaginatively, constituted the Crumbles Bungalow as a 'crime scene', elaborating a public template of what a modern forensic investigation should like, including: systematic searching and recording and the creation of a chain of custody. Secondly, I will argue that despite being projected as a spectacular case that brought English CSI into being, the public imaginings of the investigation, paradoxically, positioned the singular authority of the 'body- centred' pathologist as the exemplary expert most publicly associated with the modern culture of CSI, rather than trace-orientated practices of police detectives. As I will show, this obfuscation performed significant cultural work, the unpacking of which reveals the historical

contingencies shaping the contexts and factors that influenced the historical development of, and the emerging public expectations about, the analytical and investigatory powers of CSI in interwar England.

In developing this latter argument, I will pay attention to press representations of the Crumbles bungalow murder investigation, representations of which gave the forensic pathologist Bernard Spilsbury central billing: presenting him as a figure who towered above Scotland Yard's finest Scotland Yard's finest detectives and officers, and whose physical appearance resembled a matinée idol. The bungalow murder, I will show, amplified Spilsbury's virtuoso, spectacle- making performance, an archetypal performer-genius of the new dawning forensic age. Of significance here is how the popular imaginings of Spilsbury's role in the Crumbles murder investigation came to be preoccupied with his 'personality' and physical appearance, rather than precise nature of his forensic practices and knowledge- claims, which, I will argue, is indicative of the way his public personae gained coherence in a new discourse of celebrity. This discourse, in turn, helped to secure Spilsbury's residence in the popular imagination as an archetypal public and authoritative figure, but also, through it, the pathologist came to personify a newly emerging mode of forensic investigation, one that was associated with the multi-disciplinary world of CSI analysis, rather than the mortuary-based examination of bodies, of which he was an exemplary practitioner. By contextualising the gaps between popular representation and practice, my aim is to broaden our understandings of the range of cultural contexts and factors that shaped the development and practices of CSI.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

MAKING SPANISH FINGERPRINTS: SCIENCE, ANTHROPOMETRY AND POLITICS AT THE BEGINNING OF THE TWENTIETH CENTURY.

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Abstract

At the beginning of the twentieth century, the physician Federico Olóriz presented a new method of fingerprinting which was adopted and developed during the rest of the century in Spain. The new method was first introduced in prisons, then employed to control crime and political dissidence and, at the beginning of the Franco dictatorship in the 1940s, applied to the whole population of Spain when fingerprints were included in the new identification card which lasted until the XXIth-century. In the first part of this paper, I review the first years of the method showing how it emerged during the so- called "silver age" of Spanish science in competition with other forms of personal identification (ertillonage). Like other aspects of early twentieth-century Spanish science, fingerprinting was conceived by Federico Olóriz as a way of regenerating Spain, as a tool for making a new, more rational police by means of science. In the first part of the paper, I will review the activities and publications of Federico Olóriz and his most famous colleague, the Spanish forensic doctor Antonio Lecha-Marzo, who published several popular books on fingerprinting and developed new techniques in collaboration with other European authors. I will pay particular attention to their activities for popularizing the new method among the police by means of lectures, textbooks, guidelines and other publications. In the second part of the paper, I will focus on the journal *Policía científica* ("Scientific police"), which was published during the years 1913 and 1914. The journal, which was aimed at the police officials, devoted many pages to fingerprinting, including general overviews, practical questions, real problems and debates. By perusing this journal, I will review several issues concerning the early circulation of the technique, namely the problems of management of visual and numerical information, the competing systems of classification, the tensions and interactions with previous forms of personal identification, and the making of bureaucratic networks by means of practical training and division of labor. I will also offer some preliminary conclusions about the different meanings of fingerprinting as both police science and bureaucratic practice, and its role to legitimate both the new "scientific police" and the new forms of control and personal identification which were urged by the convulse political context of Spain in the early twentieth-century.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

THE PROFESSIONALIZATION OF ELECTROCARDIOGRAPHIC PRACTICES IN EARLY 20TH-CENTURY BARCELONA

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Abstract

It's not always easy to strictly define the borders of a medical discipline. According to a rigid application of criteria and considering "cardiology" as our object of interest, it was around mid-20th century Barcelona that such medical specialty was the focus of new medical associations, journals, national meetings and schools. Actually, the Catalan medical directories published in 1930s, just before the outbreak and clash of the Spanish Civil War, hardly announced the name of twenty medical doctors -all of them working in Barcelona- that considered themselves as experts in what they called as "circulatory system", or diseases of the heart and blood vessels. In fact, the medical heart matters were a major issue of general pathology for most of the 20th century and did not acquire an official status as a medical specialty until the late 1970s.

In this paper we want to consider a long stage in the process of creating and communicating medical knowledge related to the world of the "circulatory system" that occurred in the first third of the 20th century. The emergence of new technologies, such as the electrocardiographic practices, not only needed a time to be assumed in terms of a technical understanding next to the graphical representations of the sphygmomanometer and X-rays images but also in terms of persuading medical practitioners about its usefulness and reliability in the diagnosis, treatment and monitoring of heart disease. In this process two consecutive stages can be traced regarding the physiological and clinic use of electrocardiography (ECG). By analyzing the publications of those interested in electrocardiographic practices we will try to understand how they built their role of intermediaries regarding general practitioners as well as the general public. It was through a consistent public and private clinic practice in the treatment of heart disease that those mediators defended the uses of ECG and other related technologies and publicized them through courses, scientific articles and new medical journals too. This amount of knowledge allowed, as a result, a fine delimitation of cardiovascular diseases and became the starting point of the configuration of a new expert with a paramount role due to the fact that heart disease is one of the leading causes of death in Western society.

Session: Experts in the Periphery — Governing Techno-sciences and Societies from the 19th to the 21st centuries

SUPERPOWER UNDERGROUND: HOW SWISS EXPERTISE SET THE GOLD STANDARD IN NUCLEAR BUNKER DESIGN

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Abstract

Neutral Switzerland at the heart of Europe is usually not known as a hotspot for the emergence of the so-called Cold War sciences. However, in one specific field of engineering the country represented the gold standard: the design and construction of nuclear bunkers. Since the early 1960s, Switzerland built the world's most comprehensive system of underground shelters for the population. By 2006 the authorities announced that Switzerland has enough shelter space for 114% of its population. To this day, Swiss building codes represent the global benchmark and Swiss products dominate the bunker technology market. Even Libyan dictator Muammar Gadaffi put faith in Swiss Bunker technology. When a team of Al-Jazeera investigated his Al-Baïda Palace, conquered in 2011, they found a bunker equipped with blast doors and ventilation systems made in Switzerland.

How did a small neutral country, located in the midst of Europe yet never once at the epicenter of the Cold War's recurrent international crises, ever become a hub for defense systems research and technology? My paper will explore the origins and the international impact of Swiss nuclear bunker expertise. It will highlight the transnational cooperation and knowledge transfers on which the unexpected career of Swiss bunker expertise was initially founded. At the same time the paper will disclose the successful local translation processes by which knowledge was transformed, contributory expertise was gained and mediated to political elites and the public at home and abroad assuring thereby Swiss predominance in the field.

Derived from a Swiss perspective and the study of an allegedly marginal field of Cold War science that gained momentum in the shadow -zone of "Big Science" and "Big Weaponry", I propound to dispense the discourse of so- called 'centers' and 'peripheries' of knowledge production and expertise in the Cold War Era. By decentering science in the Cold War, we gain a more nuanced understanding of the complex and highly dynamic processes of formation and transformation of science and technology during the Cold War—a process, which neither followed clear- cut national, institutional and disciplinary boundaries nor political, ideological or economic alliances and constraints.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Life At The Centre: Is Scientific Biography The Next Step?

In the course of the twentieth century, biography was often disregarded in history of science due to its perceived positivist leanings. Social studies of science did not value it either, as they assigned a lesser role to individual contributions. However, over the last decades scientific biography has unmistakably gained historiographical currency. It is now widely accepted that biography can be used to integrate the individual and the collective, the intellectual and the institutional contexts of science, and generally the cultural, political, social and economic factors involved in the production of knowledge. Used in varied ways, the genre has grown in popularity. As a result, the role, scope and impact of biographical studies are now discussed by an increasing number of historians. By proposing this session, we intend to bring this discussion into STEP. We are especially interested in exploring biography in connection with transnational and comparative approaches. Questions we would like to address include: what can biography tell us about the interplay between individual and collective dimensions of knowledge production, in geographical areas, networks and communities usually associated with the notion of "periphery" (European or otherwise)? Are there scientific lives that we may call "peripheral"? Is the centre-periphery dichotomy of any use to elucidate idiosyncratic and existential aspects of the scientific life? Does the dichotomy resist when such aspects are brought to the fore?

Session: Life at the centre: is scientific biography the next STEP?

MANUEL DE ARAÚJO GUIMARÃES AND THE ROLE OF SCIENCE IN THE PUBLIC SPHERE IN EARLY 19TH-CENTURY RIO DE JANEIRO

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Abstract

Since Kenneth Maxwell and Maria Beatriz Nizza da Silva called the attention to the so-called "Generation of the 1790s", this group of Luso-Brazilian naturalists and men of science has increasingly attracted the attention of historians. As a matter of fact, they could be counted among the first supporters of the idea of a Luso-Brazilian Empire based on Rio de Janeiro that eventually (for internal and external reasons) led to Brazilian independence in 1822. Not acidentally, the naturalist José Bonifácio de Andrade e Silva became the patriarch of Brazilian independence. Accordingly, there are a few good studies on characters such as J. B. de Andrade e Silva, Manuel Ferreira da Câmara, José Vieira Couto and José Veloso Miranda, which focused especially on their scientific ideas and practices. Nevertheless, with the exception of J. B. de Andrade e Silva, little attention has been paid to their effective involvement in the independence movement and even lesser research has been conducted on the articulation between their scientific beliefs and practices and their political ideas and activities. However, the majority of these intellectuals took part in the political and societal discussions that shaped political life, particularly after the move of Portuguese Court to Rio de Janeiro in 1808.

In this paper, I argue that this group shall be associated with the establishment of a "public sphere" (in a Jürgen Habermas sense of the concept) in Rio de Janeiro in the early nineteenth century. As Habermas stresses, the public sphere is concomitant with public authority. In the case of this group of intellectuals, their public authority was largely based upon their scientific expertise. Manuel Ferreira de Araújo Guimarães (1777-1838), a Bahian-born astronomer, mathematician and journalist, who after having studied in Lisbon became professor at the Royal Military Academy of Rio de Janeiro, is a case in point. In Rio de Janeiro, Guimarães got involved in translating science textbooks and in writing his own textbooks on astronomy and geodesy, and in launching a science periodical that became quite influential in its time. Furthermore, he backed the Brazilian independence movement, eventually becoming elected to the Constituent Assembly, after the Independence. A biographical study of Manuel de Araújo Guimarães shows the importance of individual scientific expertise as a tool of public authority, and therefore the influence of individuals (in this case, 'men of science') in the making of a new political order.

Session: Life at the centre: is scientific biography the next STEP?

THE ENLIGHTENED JESUIT: MONTEIRO DA ROCHA (1734-1819) AND THE REFORMATION OF THE UNIVERSITY OF COIMBRA

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Abstract

José Monteiro da Rocha (1734-1819) was a key figure in eighteenth-century Portugal. A mathematician and astronomer, he played a crucial role in the appropriation of the Enlightenment in the country. Over the last quarter of the century he steered the reorganization of the University of Coimbra (the only university in Portugal until 1911) and supervised the elaboration of new curricula in the mathematical sciences. These reformations were promoted by the almighty chancellor of King José I, the Marquis de Pombal. In Pombal's view, revamping the university was as a pressing need in a backward country he deemed plagued by a longstanding influence of the Society of Jesus.

In spite of Monteiro da Rocha's leading role in this process, it was only recently that he started to attract attention from historians of Portuguese science and culture. This might be explained by a major overturn in his life. Originally a member of the S.J., Monteiro da Rocha eventually became the frontrunner of Pombal's anti-Jesuitical reformation. A character with such a life path is historiographically difficult to accommodate, since the study of this period remains constrained by the dualism Pombal vs. Jesuits. In this talk I shall bring the seeming paradox of Monteiro da Rocha's life and career under focus, whilst addressing his work on the determination of longitude, his action as a reformer of mathematical syllabuses, his role in the foundation of the University's Observatory, and the way he shaped the Coimbra Ephemeris (published from 1803 onwards).

I intend to show that, by placing these undertakings in a wider biographical frame, we will gain not only a clearer picture of Monteiro da Rocha's life and career, but also several clues for a better understanding of how the Enlightenment was appropriated in Portugal, what obstacles emerged in this process, and what kind of strategies were implemented as a response.

Session: Life at the centre: is scientific biography the next STEP?

AUGUSTE DE SAINT-HILAIRE (1779-1853): BEYOND EUROCENTRIC IDEAS

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Abstract

The botanist Auguste de Saint-Hilaire traveled through Brazil, from 1816 to 1822. Back in France, he became an authority in Brazilian matters. I believe that the key interpretation for this achievement resides in the analysis of his capability of dealing with the Brazilian élite. Despite his mild contempt for Iberian culture, the naturalist always expressed gratitude for many people that helped him during his stay in Brazil. He didn't name explicitly any distinguished person when was the case of an unpleasant situation. On the contrary, other travelers – with whom he disagrees – never recognized the obligation they had towards the Portuguese and the Brazilians. Saint-Hilaire also became a reference contact for Brazilians in France. He used to write recommendation letters and to give publicity to Brazilian writers in French reviews. The Brazilian élite used to criticize precisely the fact that European travelers didn't distinguish between the upper classes and commoners. Saint-Hilaire's behavior was also particular because of his way of dealing with Brazilian men of science. For him, the scientific field has its own rules that establish as correct the practices in use in European centers. Saint-Hilaire discriminates individuals, situations, skills, but always excludes non-specialized knowledge and those of the lower social groups. Therefore, the French naturalist established a deep relationship with Brazilians that was far more complex than the fact that it was based on the belief in the superiority of European culture. Probably, the values of international networks, like Freemasonry, aristocratic families and – maybe – his connections with Mesmer's followers allowed him to see "Brazilians" as a heterogeneous and hierarchical aggregation.

Session: Life at the centre: is scientific biography the next STEP?

AN ORDINARY CHEMIST, IN AN ORDINARY LABORATORY, AT AN ORDINARY UNIVERSITY: IS LARS FREDRIK SVANBERG REALLY INTERESTING?

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Abstract

Lars Fredrik Svanberg (1805-1878) was a chemist in Sweden, whose place in history for a long was determined by the fact that when he asked for money form Uppsala university to do chemical research on urine, was met by the words ”we think the captain can do these experiments in his own chamber pot”. The story is probably a myth. In fact Uppsala University during the end of the 19th century was a normal university when it came to the sciences.

Svanberg was professor of Chemistry at Uppsala University between 1853 and 1874. His education was not very original. He worked with mineral analysis, and his relative meagre scientific production dwelt mainly in analytical chemistry. He was also a pupil of Berzelius, who ranked him high. He was thus trained in the centre of chemistry, but his career and his scientific production leave the impression of a chemist in the periphery. In his whole life he never broke up with the chemistry he learned from Berzelius. The life of Svanberg might thus teach us that the connections between centre and periphery do not necessarily have to do with geographical distance (in fact it rarely has), but should rather be considered in the light of changes in the science itself. This paper is an attempt to use the biography of an unknown chemist (certainly so outside Sweden) and his daily work to discuss centre and periphery from the aspect of what was going on in the science of chemistry, such as the rise of a new organic chemistry, theory of valences etc. Svanberg will also give an example of the minor importance of geographical aspects, when discussing centre and periphery.

Session: Life at the centre: is scientific biography the next STEP?

LIVING IN A 'NO MAN'S LAND´: THE SCIENTIFIC LIFE OF FRANCISCO LUÍS PEREIRA DE SOUSA (1870-1931)

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Abstract

Kragh defended that biography was useful only when writing about 'the aristocrats' of science (Helge Kragh (1987), *An Introduction to the Historiography of Science*, New York: Cambridge University Press, p. 173). This means that the scientific life of Francisco Luís Pereira de Sousa (1870-1931) could never raise any special attention. However, the scientific life of this military engineer that was transformed into a geologist is quite appealing. It is what historians of science usually call a 'biography in context' because it conveys some broad characteristics of the panorama of Portuguese geology in the first decades of the twentieth century. It also sheds light into the daily routine of an 'everyday man of science' in Portugal at the time. And the scientific life of Pereira de Sousa is particularly enlightening when considering one of the main historiographical questions addressed by STEP: the circulation and appropriation of scientific knowledge.

Pereira de Sousa travelled frequently to Paris where he worked in the Laboratory of Mineralogy of the Musée d'Histoire Naturelle and he was mostly influenced by the theories of François Antoine Alfred Lacroix (1863-1948) and Eduard Suess (1831-1914) on tectonics. Pereira de Sousa made use of some of the concepts developed by those geologists in his own research, applying them to the geology of the Portuguese territory.

The present paper intends to be an approach to the scientific life of Pereira de Sousa and also the starting point for a reflexion on more general historiographical questions concerning the writing of scientific biographies in the European periphery

Session: Life at the Centre: Is Scientific Biography the Next Step?

AN APPROPRIATE ENCOUNTER: THE SCIENTIFIC BIOGRAPHY OF THE BACTERIOLOGIST RUDOLF KRAUS (1868-1932) IN A TRANSNATIONAL PERSPECTIVE

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Abstract

This paper shows how scientific biography can serve as a practical way for understanding aspects of the historical development in biomedical science. Although the historiography in general discredited scientific biographies for many years - arguing that the method caused poor analysis of context, in the past fifteen years historians of science acknowledged its usefulness as a methodological approach. For instance, some objectives of the scientific biographies are the understanding of disciplines´ development or international scientific relations. This methodology has the same ambition of the transnational historical studies, since both searches not perceived relations in order to explain process. Scholars from 'periphery' have contributed a lot to the emergence of the transnational approach because they explore the peripheries´ contexts and indicate its connections with the centers process. In this sense, they show unperceived interactions between actors, institutions and objects in their historical analysis. The scientific biography of Rudolf Kraus helps to understand aspects of production, circulation and trade of biological products as he directed bacteriological institutes in Buenos Aires, São Paulo, Vienna and Santiago. Being a participant in the bacteriological discussions in Europe and one of the main leaders on this issue in the European periphery, Kraus circulated in important forums of bacteriology knowledge production as well as in places where this knowledge was being verified. His professional life shows the place of the 'peripheries' in the development and dissemination of new biological therapeutics as he confectioned and imported sera and vaccines among European and South American countries. Beyond his directorships of bacteriological institutes, Kraus had a transnational carrier, since he engaged himself in discussions on the communication between scientists and governments in order to establish cooperation on the issue of diseases control. His scientific biography shows, therefore, the interaction of people, knowledge and objects operated on a transnational level.

Session: Life at the centre: is scientific biography the next STEP?

EXPERTS AND SCIENTIFIC FAMILIES IN THE PERIPHERY: THE CHEMISTS ANTONIO CASARES, AND HIS SON JOSÉ CASARES

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Abstract

Scientific biographies are a genre that has been employed in history of science with many different uses. Nowadays, historians as Söderqvist, support a renewed view of biographies, and consider that they are a useful narrative in history of science if they are able to combine some of their different uses. The case study of this paper is focused on Antonio Casares Rodriguez (1812-1888) and his son José Casares Gil (1866-1961). Both were prominent Spanish chemists who wrote several chemistry treatises (on general chemistry, and analytical chemistry, respectively), held important institutional positions (such as rector of the University of Santiago -Antonio-, and senator and president of two Royal Academies –José-), and worked on water and chemical analysis.

The aim of this paper is to combine the biographical narrative with three different approaches: scientific experts, comparative approach and the STEP concept. First, the biographical approach shows how experts were not always neutral consultants with an objective advice, but scientists with personal and professional interests. Biographies are a useful tool to show the role of experts as mediators between the public sphere and the governments or corporations, by taking into account not only their publications and official positions but also their institutional power and professional recognition. Second, I will consider the idea of "scientific family". Collective biographies and prosopographies can be employed to compare, to contextualize and to study scientific collaboration, research schools, professions or disciplines. I will explore the idea of "scientific families" to analyze not only the scientific creative work, but the construction of a network of personal interests and influences that both chemists employed to consolidate their authority and to gain more spaces of influence. Third, I will study the active role of scientists of the periphery to appropriate and adapt science to the local scientific traditions and situations.

Session: Life at the centre: is scientific biography the next STEP?

PALMES: MEASUREMENT, CLASSIFICATION, AND NETWORKING IN CATHOLIC PSYCHOLOGY

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Abstract

The Jesuit priest Fernando Maria Palmes (1879-1963) was, together with Emilio Mira y López, one of the first professional psychologists working in Barcelona. Although he had formal training in philosophy and theology, soon he would develop a growing interest in psychology. While he was teaching psychology at a Jesuit College in Barcelona called 'Colegio Máximo de San Ignacio de Sarriá', he had the idea of founding a psychological laboratory in this institution. In order to get to know the functioning of other psychological laboratories he travelled to places considered by him scientific centres in Europe. Three years after his journey, he finally succeeded founding a laboratory "in the periphery".

Palmes' life spans over several periods of Spain's history characterized by deep political changes going from the Restoration period, the Rivera Dictatorship, the Second Republic and, after the Civil War, the Franco era. In the present paper I shall explore the life and work of the Spanish Jesuit taking into account his textbooks and publications on psychology, as well as his practical professional work as a psychologist. My aim is to obtain an idea of the general development of his thinking in relation to the political changes, the Jesuit institutional power, and the Catholic transnational network established in the field of psychology at the time. Finally the usefulness of the historiographic centre-periphery dichotomy will be discussed for this biographical case.

Session: Life at the centre: is scientific biography the next STEP?

THE LIFE AND TIMES OF FÉLIX RODRÍGUEZ DE LA FUENTE: ETHOLOGY AND CONSERVATIONISM FROM FALCONRY TO (TRANS)MEDIA

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Abstract

Félix Rodríguez de la Fuente (1928-1980) is a key figure in the history of the natural sciences in 20th century Spain. A physician by trade, he briefly worked as a dentist before devoting himself to his passion for nature, first through falconry, and later on through his discovery and downright penchant for the educational and creative possibilities of mass media.

By way of a skilful navigation of politics and institutions, Rodríguez de la Fuente became an extremely successful film, radio and television producer and director, as well as author and editor. Through a carefully crafted and remarkably complex media cross-platform endeavour (including numerous publications, from encyclopaedias to comic strips, as well as films and radio and television programs), he put across a decidedly influential as well as controversial representation of nature (through conservationist and ethological premises) and the natural sciences (as a discipline and as a profession). Ultimately, such an effort made him a staple of the media landscape and a highly charismatic as well as contentious character in the complex socio-political scene of the late Franco's dictatorship and the changeover to the democratic administration in 1960s and 1970s Spain.

Exploring Rodríguez de la Fuente's life allows situating his work in the history of the natural sciences in 20th century Spain. Yet, in addition, owing to the particular traits of his media work, but mostly regarding his massive correspondence with readers, listeners and viewers, it allows to tackle crucial questions concerning wide-ranging processes of production and management of scientific knowledge.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Medicine And Public Health: Networks In Colonial Spaces

This panel invites scholars interested in the question of medicine and empire (19- 20th centuries) to reconsider current approaches to the aforesaid field and bring new perspectives aspects and topics to the debate. From the structural questions regarding imperial medicine and indigenous knowledge, colonial medicine and endemic ailments, tropical medicine and empire building, centers/ peripheries/colonial networks, to multiple-sources local studies and cross-empire analysis, we welcome contributions that aim to expand and refresh the field.

This panel invites scholars interested in the question of medicine and empire (19- 20th centuries) to reconsider current approaches to the aforesaid field and bring new perspectives aspects and topics to the debate. Besides the structural questions regarding imperial medicine and indigenous knowledge, we will discuss the circulation of knowledge and practices between centres, peripheries and ultra-peripheries in order to reflect on tropical medicine and empire building, centres/ peripheries/colonial networks, as well as multiple-source local studies and cross-empire analysis. We welcome contributions that aim to expand and refresh the field.

Session: Medicine and Public Health – Networks in Colonial Spaces

DISEASE AND HEALTH IN THE TROPICS. IMPLEMENTING HEALTH SERVICES IN MOZAMBIQUE IN EARLY XXTH CENTURY

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Abstract

The close relation between Medicine and Colonialism is clearly shown on the many studies undertaken during the colonial period emphasizing the role of the healthcare services in the process of implementing the colonialism, as well as on the more recent ones defending the subordination of these services to the objectives of the colonial system. However, the implementation of these services was a complex and multifaceted process, not limited in this respect, and worth of addressing considering either the way it was organized, its particular purposes and action or the production of specific documents.

Focusing on Mozambique we intend to call attention on some of these documents, particularly the health services reports, underlining how they are essential to evaluate the performance of these services and their contribution to the organization of a *corpus* of reference on tropical medical knowledge, as well as to account for the many constrains interfering in the implementation of the healthcare system; being these constrains the main topic to explore in this presentation.

Most of these documents testify the weakness of the colonial health system, not so much for the way it was implemented, but because their functioning was continuously coming up with external difficulties. These difficulties, resulted from inadequate policies related to the lack of knowledge on the tropical conditions (environment, territory, people…), or to a non-articulation of the several administrative and public services involved and the definition of priorities within the political colonial agenda.

Thus, in this paper we will discuss the implementation of the health services in Mozambique, focusing on the relation disease / health *versus* public works / sanitation and in the perspective of both the interaction between European and non-European medical knowledge and practices, and the several local constrains interfering in the operation and action of these services.

Session: Medicine and Public Health – Networks in Colonial Spaces

BETWEEN FAILURE AND SUCCESS - SLEEPING SICKNESS AND NETWORKS OF PORTUGUESE TROPICAL MEDICINE (1901-1916)

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Abstract

This paper aims to reflect about the trajectories of the Portuguese specialists in tropical medicine in the early twentieth century by focusing on two of the most significant moments in their research on sleeping sickness (human trypanosomiasis from 1904) which projected their efforts onto the international stage.

The etiological agent of sleeping sickness is associated with a controversy among researchers from different European countries, i.e. the first Portuguese mission to study the disease in Angola in 1901, led by Aníbal de Bettencourt (1868-1930) and the first British mission sent to Uganda in 1902. This controversy was resolved in 1904 when Aldo Castellani (1877-1971) was credited with the discovery, thus placing Portuguese scientists at a disadvantage.

However, Portugal was to assume a prominent position in the international medical community after eradicating sleeping sickness on the island of Principe between 1904 and 1915; the results of the campaign were subsequently presented at international forums as sleeping sickness became an important issue in colonial control programs in Africa and in international medical networks.

Against the background of this scenario we intend to discuss the peripheral position of Portugal and its contribution during two different moments in the international debate on the combat of this typically African disease, which became a central element in the ongoing European colonization of Africa. The paper will not only focus on the historiography of Portuguese achievements, but also place them in the context of notions of imperialism, colonialism and emergence of tropical medicine networks.

Session: Medicine and Public Health – Networks in Colonial Spaces

GOAN COLONIAL MEDICINE IN CONTEXT

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Abstract

In the last twenty years, scholarship on Medicine and Empire expanded from its early predominantly British-empire-centered approach to a variety of studies in colonial tensions and arrangements experienced under other European colonial rules (French, Dutch, Spanish, Portuguese, Belgian, Danish, Italian, etc), diversified the use of sources (colonial, regional, local, oral, vernacular), and of disciplinary frameworks (social history, anthropology, literature, architecture, gender studies, post colonial studies, etc). More recently, scholars have engaged in comparative studies of medicine and colonialism, calling for more studies of the flows of knowledge, practices, artifacts and people across empires, and focusing on the agency of the subjects beyond the norms and rules. In this paper I will discuss the case of Goan colonial medicine, self-celebrated in reference to the Portuguese rule, yet predominantly enacted by Goan subjects and embedded within the wider politics of the subcontinent.

Session: Medicine and Public Health – Networks in Colonial Spaces

HEALTH SERVICES, ENDEMIC DISEASES AND MENTAL HEALTH IN FORMER PORTUGUESE AFRICA

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Abstract

The association between endemic diseases and mental health has in recent years become a thread of growing importance in the field of tropical medicine, on a par with a reappreciation of the history of mental disease and psychiatry in empire. As a result, the focus on mental health has uncovered neglected aspects of preventative and curative medicine and of programs that center(ed) on the combat against debilitating endemic diseases such as leprosy, leishmaniasis, trypanosomiaisis and syphilis. Given the relevance of a historical and anthropological perspective on these issues for an understanding of public health in tropical regions, the present paper takes a closer look at the role attributed to mental health by colonial health services in regions that have so far been neglected in this respect, i.e. former Portuguese Africa. Particular emphasis will be given to biomedical views proposed by 'colonial science' on African mental health and the approaches pursued by colonial and tropical health officials in disease control programs. At the same time, connections are established with local views on mental disorders and the socio-cultural contexts in which these afflictions emerged in Angola, Guinea and Mozambique. Comparisons will also be made with research on mental health undertaken in other colonial territories in Africa under British and French control.

Session: Medicine and Public Health – Networks in Colonial Spaces

PORTUGUESE INDIA AND THE WORLD HEALTH POLICIES: TOUGH CALLS IN TIMES OF POLITICAL CHANGE

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Abstract

This paper is a preliminary reflection on the intersections between politics and health in former Portuguese India, from 1945 to 1961. This timeframe encompasses Portugal's ratification of the World Health Organisation's Constitution and its participation in the Regional Office for South-East Asia of the WHO as the "administrator" of Portuguese India (comprising Goa, Daman and Diu on the West coast of India), until its integration in the Indian Union in December 1961.

Colonial medicine waned with the dawn of the post-colonial era and the raise of new international health policies and institutions. Changing perspectives on health and medicine were part and parcel of the new world order guided by development beliefs. However, while after World War II the independence movements started off, the Portuguese authoritarian regime stuck to its Imperial rhetoric and to Portugal's definition as a transcontinental Nation. When WHO was officially established, in 1948, Portugal was already on the alert for the effects of India's newly gained independence (1947) not only in Portuguese India but also in the international political scene. Thus, the Portuguese India health administration and its involvement with the WHO and the SEARO are part of the changing international political trends. It is a multi-layered process illustrating the historical dynamics of global health policies and institutions, made of people acting at different levels and stages and struggling to attain balance amongst the complexity of interests, meanings and views at stake.

Through Portugal's (still colonial) effort to profit from the involvement with the WHO and to cope with the subtleties of its values' and standards' negotiated balance, we can problematize the dynamics of medicine and health in the dawn of the post-colonial era. We can also attend to the shifting settings revealed at the intersections between international norms and national/local interests.

Session: Perspectives On Personalities, Institutions And Disciplines

FROM AMATEURISM TO PUBLIC SERVICE: METEOROLOGY IN BARCELONA AT THE TURN OF THE XX CENTURY

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Abstract

Meteorology was developing fast at the turn of the XX Century. It was evolving as a science and there was a growing society demand for meteorological products. Barcelona, in NE Spain, is recognized as the capital of a nation, but it is not a capital of a state. Thus, technical and political problems posed serious handicaps to the access of regional meteorological products (climatological data, forecasting, etc.) important for peasants and also for many sectors of a fast developing industry. Because of this situation several initiatives, some from private origin; but also from public regional institutions took place on this field.

Among them, at the end of XIX century amateurs organized on a meteorological network for agricultural purposes. Religious orders contributed to regional meteorology setting up an important number of observatories. But also the best astronomical and meteorological observatory was born from the will of a wealthy gentleman. Already on the early XX century two big observatories were settled independently by the Academy of Sciences and the Jesuits. Scientific associations contributed with a new, larger, pluviometric network and even started operational weather forecasting.

The different initiatives were characterized by (i) a dispersion and duplication of efforts, proper of the lack of a centralized coordination but, at the same time, (ii) an enthusiastic and dynamic environment, scarcely found in official initiatives. Lacking of solid infrastructures and funds, most of the initiatives were short lived; but their scientific and social results outperformed those available from the public services and institutes in most of the cases.

This study aims to evaluate the importance of the research and developments of meteorology occurred in a socially dynamic environment but almost without guidelines, as it was in Barcelona at the turn of the XX century as well as their main characteristics.

Session: Perspectives On Personalities, Institutions And Disciplines

EMPTY BODIES. AUTOPSIES IN THE DISCIPLINARY STRUGGLE BETWEEN MACROSCOPIC AND PATHOLOGICAL ANATOMY IN BRUSSELS, 1870-1920

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Abstract

In 1906, an assistant for the university course in anatomy complained that too many bodies that were to be used for dissection, had already been autopsied. How could the students learn from empty bodies?

In the late nineteenth century, a shortage of bodies led to a dispute between macroscopic and pathological anatomy in Brussels. While fewer and fewer bodies were being transported to the amphitheater for dissection, the amount of autopsies increased significantly. How did pathological anatomists use the autopsy in the disciplinary struggle?

From 1878 onwards, autopsies no longer took place in the same amphitheater as dissections. The two main Brussels hospitals had installed a separate autopsy service, modelled after the Viennese *Pathologisch-anatomische Institut*. Pathological anatomists claimed that a focus on pathological anatomy, combined with a system wherein 'autopsies were the rule rather than the exception' had made Vienna into an innovative medical center. Brussels aspired to follow this example. Moreover, pathological anatomists claimed that autopsies could lead to medical innovation without stirring negative sentiments among the general public. Unlike the dissection, the autopsy was said to be invisible and therefore considered more humane. In this way, pathological anatomists demarcated themselves from macroscopic anatomy. Their argument was successful: in 1890, the city council gave physicians the right to order an autopsy for every hospital patient who died under their care. The family of the deceased person was not to be consulted; nor were they to be informed. This more or less hidden practice of autopsies, however, gave rise to mediatized scandals. How did this controversy effect the authority of pathological anatomy, and what was the reaction of pathological and macroscopic anatomists? By analyzing autopsy as a demarcation strategy of pathological anatomists, this paper shows the practice of disciplinary boundary work, both in the scientific and the broader cultural domain.

Session: Perspectives On Personalities, Institutions And Disciplines

ÁNGEL ANGUIANO AND THE CREATION OF THE NATIONAL ASTRONOMICAL OBSERVATORY OF MEXICO IN THE 19TH CENTURY

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Abstract

Ángel Anguiano, architect, was appointed as the first director of the new National Astronomical Observatory of Mexico (OAN), in 1876. This situation made him responsible for setting the new observatory, the decision of what instruments were needed, their features, and hiring the staff. His position as head of the OAN pushed him to the forefront of the emergent community of Mexicans astronomers. Anguiano's appointment, not only gave him the responsibility his post entailed, but also set him as the main astronomical expert in the country. Nevertheless, and especially during the first years, his practical experience was limited, what putted him in an ambivalent position: an expert facing the local community, but a novice regarding the international one.

Situated in this context, I will analyse the historical, cultural, and political conditions that made possible to an architect to become the first director of the first Mexican National Astronomical Observatory in late nineteenth century. I will explore his trajectory during his twenty years of work and his ambivalent situation. This will drive me to analyse how the acknowledgement of someone's expertise can be closely linked with context and the perception some relevant communities have, regardless of the *expert*'s real knowledge. I will also question the pertinence of terms like *expert* in historical cases and possible equivalences such as *commissioner*, *savant*, or simply *astronomer*, in a context were academic formation of astronomers was mostly inexistent.

Session: Perspectives On Personalities, Institutions And Disciplines

LABORATORY SCIENCE AT THE SCHOOL OF MEDICINE OF BELO HORIZONTE: CIRCULATING MODELS FOR MEDICAL TRAINING, 1911-1949

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Abstract

This presentation relates to an ongoing research that examines the science-medicine nexus, its tensions and mutual interactions, in medical training at the School of Medicine of Belo Horizonte, Minas Gerais, Brazil. It focuses on the circulation of models from laboratory sciences such as physics, chemistry, physiology, histology, pathological anatomy, pharmacology etc. during the period of creation of that medical school and its consolidation in Brazilian medical setting. Starting from the medical training and institutional sources, the aim is to understand how the laboratory approach was introduced as one of the scientific grounds for teaching some medical practices of prevention, diagnostic and therapeutic. During this period, foreign professors were hired for the chair of physics and chemistry. In the following years, these chairs also appeared in the curriculum as medical physics and medical chemistry, evidencing a specific employment of these sciences to medicine. National and international inter-institutional agreements and exchanges were established. Before the laboratories of the school were consolidated, some professors carried out their researches at institutions and biomedical laboratories financially supported by local state administration. In this situation themes such as bromatology, minerology and toxicology, that were scientific issues for the Department of Hygiene of the state of Minas Gerais, were at stake. With the support of the Rockefeller Foundation several students were sent to U.S., at Harvard University for instance, in order to improve their scientific training in research fields like medical chemistry and biochemistry. Attached to the School there was the Radium Institute created in 1922 and visited by Marie Currie in 1926. There, the knowledge from chemistry and physics were applied to therapeutics. Evidences show that the laboratory science in several fields was a way to give scientific status to medical training and to circulate new and international theories and scientific practices in that medical school.

Session: Perspectives On Personalities, Institutions And Disciplines

COSIMO DE GIORGI AND THE DEVELOPMENT OF NATURAL SCIENCES IN THE SOUTH OF ITALY

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Abstract

Contrary to a largely shared prejudice, according to which natural science, especially physics, cannot express itself in a language different from mathematics and in particular analysis, not all modern natural science is written in mathematical language, as Galileo in particular had on the contrary maintained. Even in modern physical science, a rigorous scientific knowledge has been sometimes obtained through a qualitative naturalistic empirical approach rather than through quantitative measurements and mathematical formalisms. Mathematical developments not yet existent, have sometimes been driven through more qualitative and intuitive approaches based on empirical data and historical series. As examples of this non-mathematical scientific approach, here I will discuss two figures of physicists, Michael Faraday (1791-1867) and Cosimo De Giorgi (1842-1922), the one (Faraday) at the hearth and the other (De Giorgi) at the southern periphery of Europe. Though with different scientific relevance and impact, they were both characterized by a more qualitative, descriptive and intuitive scientific approach in front of the then prevailing mathematization of physics. In particular, Faraday anticipated new mathematical methods, especially geometrical and topological, not yet existent, but also De Giorgi, a brilliant geophysicist, anticipated new statistical methods for the treatment of large empirical, meteorological and seismic data bases.

Session: Perspectives On Personalities, Institutions And Disciplines

VINGT ANS APRÈS: INTERNATIONAL ASTRONOMICAL UNION AND WOMEN

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Abstract

In a sort of Alexandre Dumas' parody, after the passing of twenty years, the paper will consider the position of women within the International Astronomical Union (IAU/UAI) and the case of those remaining to European countries. After papers published in 1989 and 1992, another one was published in 1993, *Un échantillon de 765 femmes engagées dans la recherche internationale - Le cas de l'UAI*. It was based on data published, in 1992, in the IAU Bulletin n°68. Now, similar data are available after the 2012 General assembly of this union. Similarly to the 1993 paper, the IAU members are divided in two categories according to the number per country. The examination, together with the percentage of women, will also look at the numbers according to the population for each country at both International and European levels. The data, so provided, allow to compare the results and to follow the evolution, in this domain, more or less when one generation passed.

Session: Perspectives On Personalities, Institutions And Disciplines

CENTER FOR SCIENTIFIC DISSEMINATION OF THE NATIONAL CANCER INSTITUTE, RIO DE JANEIRO, BRAZIL

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Abstract

The article seeks to analyse the importance of the former headquarters of the Board of Public Health – DGSP (Diretoria Geral de Saúde Pública), in implementing and institutionalizing Brazilian public health policies, and the importance for Brazil of its restoration and reuse as the Center for Scientific Dissemination (Centro de Difusão Científica). Constructed (1905-1914) on the initiative of the famous Brazilian scientist Oswaldo Cruz and designed by the Portuguese architect Luiz Moraes Júnior, the following aspects of the old headquarters of the DGSP are examined: the original site; the economic and technical means used in construction; the reasoning, programmes and purpose behind its use; economic, physical and conceptual limits and conditions of the space; the creators, their ideas and programmes; the architects, their training, works and methods; the buildings and their environmental surroundings throughout the 20th century in the city of Rio de Janeiro. The article intends to make connections with similar initiatives in other countries of the world especially with France. Importantly, Oswaldo Cruz studied at the Institut Pasteur (1896-1899) and was a disciple of the famous French scientists Emile Roux and Louis Pasteur. The article also analyses the various proposed interventions: structural reinforcement, modernization of the installations, recovery of the construction materials and systems, as well as historic and architectural values; the original forms, volumes and spaces of the buildings. The current initiative taken by the National Cancer Institute (Instituto Nacional do Câncer - Inca) of the Health Ministry, current owner of the property, recovers and preserves a reference point for the origin, evolution and institutionalization of Brazilian public health policies.

The proposed reuse is directed to researchers, health professionals, doctors, residents and, especially, the general public, who will benefit from the implementation of the modern scientific education and research centre focused on prevention, early detection and monitoring of cancer. The modern resources of digital technology will be used in both activities, education, teaching, research and scientific culture, as in the implementation, preservation and dissemination of scientific and historical permanent colections.

Session: Perspectives On Personalities, Institutions And Disciplines

THE INSTITUTE OF BOTANY OF PORTO AND THE HISTORY OF EVOLUTION IN PORTUGAL (20TH CENTURY)

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Abstract

The presentation aims at providing a comprehensive view on the role played by some of the most influential botanists of the University of Porto in the history of evolution in Portugal during the 20th century. Thus, we will be analyzing the influence of evolution on the scientific production of the directors of the Institute of Botany of the University of Porto during most of the last century, including their educational works. The Institute of Botany was created in 1920 and its first director was professor of botany of the University of Porto Gonçalo Sampaio (1865-1937). Sampaio made significant contributions in the field of evolution. He included evolutionary considerations in his systematic labour, most notably in his classificatory works. Earlier in his life, he had invoked Darwin's theory of evolution by natural selection in support of his defense of the replacement of Portugal's monarchy by a republican regime. Between 1935 and 1945, the Institute of Botany was under the directorship of Sampaio's disciple Américo Pires de Lima (1886-1966). Pires de Lima presented a synthesis of the history of evolution in his 1913 academic thesis "A evolução do transformismo" (The evolution of transformism) and granted a considerable importance to evolutionary themes throughout his eclectic scientific career. Joaquim Ferreira (1890-1963) was director of the Institute of Botany between 1956 and 1960. Joaquim, albeit mainly concerned with microbiology, dealt with evolutionary questions in his important microbial studies. He was succeeded by Arnaldo Roseira (1912-1984) as director of the Institute of Botany. Roseira, who was director until 1982, tackled evolutionary issues early on in his academic career with a work on the main existing theories of evolution in 1934 when he was only 22 years old. He continued to pay attention to evolutionary topics throughout his career, namely in his works on plant sociology. The directors of the Institute of Botany, like the directors of the institutes of Zoology and Anthropology, played an important role in the advancement of the research and teaching of the natural sciences at the University of Porto. Some of the directors, most notably Américo Pires de Lima, were very close to the dictatorial regime (1933-1974).

Session: Perspectives On Personalities, Institutions And Disciplines

LUÍS ARCHER S.J. (1926-2011) – IN A QUANDARY BETWEEN WILL AND DEVOTION

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Abstract

Luís Archer S.J. (1926-2011) was one of the most prominent Portuguese scientists in the 20th century. However, his scientific career was not straightforward. After having obtained his degree in biology with honours in 1947 (Oporto), he was admitted to the novitiate of the Society of Jesus, causing general consternation amongst his professors and colleagues who were expecting him to pursue a scientific career. Following the novitiate he studied philosophy (Braga, 1951-1954) and theology (Frankfurt, 1956-1960) and was finally ordained a priest on July 31, 1959. Four years after obtaining his degree in theology, when he thought that he would stay in Portugal, he was sent to the United States to study molecular biology. It was a priority of the Society of Jesus to make use of Archer's scientific talents, since there had been no Portuguese Jesuits devoted to scientific research since the late 1950s. When he completed his doctorate and returned to Portugal, in 1968, genetics - a novel and trendy field - was still completely unfamiliar to the Portuguese biologists. Although he wanted to be exempted from a scientific career, as his personal letters often state, he obeyed his superiors and established the first university courses of molecular biology (late 1960s) and the first Laboratory of Molecular Genetics at the Gulbenkian Science Institute (1971) - which represented the dawn of scientific research on molecular genetics in Portugal. In this paper, I shall analyse Archer's scientific life as a long-lasting dilemma between his personal desires and his vow of obedience as a Jesuit. A dilemma that ultimately led the to the emergence of a completely new scientific field in Portugal.

Session: Popularizing Science and Technology

POPULARIZATION OF SCIENCE AND MATHEMATICS IN THE JESUIT COLLEGES OF THE 17TH CENTURY

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Abstract

The ultimate goal of the Society of Jesuits was "to strive especially for the defense and propagation of the faith" by means of "the education of children and unlettered persons in Christianity" (quoted from the Papal bull of 1550, *Formula of the Institute of the Society of Jesus*). Mathematics played an important role in achieving these goals. One the one hand, their intricate knowledge of pure mathematics and the mixed mathematics such as astronomy, calendar-making, hydraulics, mechanics and geography turned out to be very fruitful in their missionary expeditions to China and Japan. On the other hand, mathematics education was part of a deliberate strategy to allure students, in particular children from the gentry in France, the southern Netherlands and Germany to scholarly studies. The twelve-volume bibliographical encyclopedia, *Bibliothèque de la Compagnie de Jésus*, list no less than 631 Jesuit authors on mathematics during the first two centuries of the Jesuit order.

In this presentation we will look at the specific strategies employed by the Jesuits at the beginning of the seventeenth century, to make pure and mixed mathematics appealing to a larger audience. Contents and form of the curriculum were prescribed in the *Ratio Studiorum*, finalized in 1599. Chairs of mathematics were established in all Jesuit colleges from 1604 onwards. The *disputationes* held at Jesuit colleges, which often had a public and a theatrical character, led to a popularization of mathematics and science. Mathematics was made more tangible through the use of all kinds of material models and artifacts, a process which led to a physicalization of mathematics. Also, the study of mathematics was not an end in itself. Mathematical learning was closely connected with other disciplines, in particular historical and biblical studies, as we shall demonstrate by the *disputationes* held during the celebrations of 1623 at Pont-à-Mousson.

Session: Popularizing Science and Technology

POPULARIZING ARCHAEOLOGY IN POLISH PRESS IN THE SECOND HALF OF THE 20TH CENTURY.

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Abstract

The aim of my presentation is to analyze how archaeology was popularized in Poland in the years 1945-1999. Five leading monthly popular science magazines were the object of my analysis and 954 articles were published. They cover a very wide range of topics, beginning by formation of the Polish state, through paleoanthropology, archaeology of Egypt, New Worlds ending with peudoarchaeological theories, such as existence or non-existence of Atlantis or traces of Aliens on the Earth. Also relationships between archaeology and politics were analysed, and use of archeology in order to present and support certain political or non-scientific theories. The scope of this paper is as well to analyze whether and to what extent the prevailing political conditions present in Poland during the period 1945-1999 affected the presentation of archaeology popular science publications. The articles being the object of my analysis were written both by very renowned authors, specialists in the area and by the journalists. The articles appear in the whole period analyzed, although there are years in which more texts are published. In the magazine it is possible to find in-depth articles, essays, short messages, book reviews and reportage on archaeology. The articles appearing in these publications were widely discussed and played a significant role in Polish scientific life during the period under consideration. It is worth noting that for a large period it was common practice for archaeological articles to be written by professional archaeologists, historians or members of archaeological expeditions.

Session: Popularizing Science and Technology

THE POLITICS OF SCIENCE POPULARIZATION IN GREECE, 1875-1912

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Abstract

In the last quarter of the 19th century, Greece witnessed a political and economic transformation in the context of the modernization programme. The circulation of scientific knowledge, ideas and practices expanded mostly through the periodical press and the scientific courses and lectures of the cultural clubs and literary societies, addressing the wide public of the urban centres. Many social groups with different agendas took part in this venture, but the emerging scientific community, considering the popularization of science an integral part of their scientific work and social status, pioneered with specific initiatives.

In my presentation I intend to discuss the various ideological trends that were attributed to the diffusion and popularization of science –from social progress to national integration and from moral and intellectual improvement to egalitarianism– identifying them with specific social groups. I will focus on the first decade of the 20th century, a period of social turmoil in Greece, reflected in education, agriculture, labour and the army. In this context, and with the strengthening of movements that were influenced by the socialist ideas, some well-known scientists united with artists and journalists to establish the Greek section of the *Alliance Scientifique Universelle*, founded in 1876 by the French ethnologist Léon de Rosny in Paris. My aim is to explore the politics of science communication through the prism of practices, ideas and values of local cultural clubs and societies as well as of an international scientific club functioning in a country of the European periphery. Concerning the latter, the Greek section made science popularization one of their main aims and the institutionalization of the "Popular University" in Greece their first target. Yet, although they spoke in the name of the "people", they maintained and reproduced the established power relations of Greek society of the last quarter of the 19th century.

Session: Popularizing Science and Technology

THE NATIONAL PROGRAM ON IMMUNIZATION AGAINST POLIO (1965/1966) IN PORTUGUESE JOURNALS

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Abstract

The first epidemics of poliomyelitis (polio, Heine-Medin disease or infantile paralysis) were recorded in Portugal in 1933 and 1935 (north and centre of Portugal). In 1935 polio was considered a disease requiring a mandatory report. Between 1930 and 1960 there were several epidemics of poliomyelitis in Portugal. In 1955, Salk discovered the injectable polio vaccine. In 1962 Sabin discovered the anti-poliomyelitis oral vaccine.

The anti-polio vaccination program anti-polio in Portugal (October 1965-June 1966) was the basis of the country's National Vaccination Program. The anti-polio vaccination program in Portugal was organized by the General Health Board (Direção-Geral de Saúde) in collaboration with the Calouste Gulbenkian Foundation. The collaboration of teachers, priests and social media (radio, journals, etc.) was also very important. The program used the Sabin vaccine.

In this communication the authors analyze the importance of the daily periodical press in the dissemination of the polio vaccination campaign and also a medical journal. The analysis focused on a regional journal, *Diário de Coimbra*, and in two national journals: *Diário de Notícias* and *O Primeiro de Janeiro*. The medical journal studied was *Jornal do Médico*.

Session: Popularizing Science and Technology

PROFESSIONAL POPULARIZATION OF MATHEMATICS IN 20TH-CENTURY GREECE: THE JOURNALS OF THE HELLENIC MATHEMATICAL SOCIETY

Maria Terdimou[a], George Vlahakis[a]

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Abstract

The aim of my presentation is to analyze how archaeology was popularized in Poland in the years 1945-1999. Five leading monthly popular science magazines were the object of my analysis and 954 articles were published. They cover a very wide range of topics, beginning by formation of the Polish state, through paleoanthropology, archaeology of Egypt, New Worlds ending with peudoarchaeological theories, such as existence or non-existence of Atlantis or traces of Aliens on the Earth. Also relationships between archaeology and politics were analysed, and use of archeology in order to present and support certain political or non-scientific theories. The scope of this paper is as well to analyze whether and to what extent the prevailing political conditions present in Poland during the period 1945-1999 affected the presentation of archaeology popular science publications. The articles being the object of my analysis were written both by very renowned authors, specialists in the area and by the journalists. The articles appear in the whole period analyzed, although there are years in which more texts are published. In the magazine it is possible to find in-depth articles, essays, short messages, book reviews and reportage on archaeology. The articles appearing in these publications were widely discussed and played a significant role in Polish scientific life during the period under consideration. It is worth noting that for a large period it was common practice for archaeological articles to be written by professional archaeologists, historians or members of archaeological expeditions.

Session: Technological Innovation, Negotiation And Exchange

WHAT'S IN A PIPE? TRANSNATIONAL NEGOTIATION OF A 'STRATEGIC' ITEM

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Abstract

By the late-1950s, the USSR had reacquired a strong position as a world oil exporter. In order to transport their oil to strategic areas, the Soviets devised a project for a colossal pipeline system, which soon came to be considered by NATO as threatening West European security. The large amount of cheap oil it would carry, could both damage the interests of transnational oil companies and enable the USSR to fuel its military machine. In order to complete their system, the Soviets needed significant amounts of large-diameter steel pipes, which they couldn't produce. In this respect, therefore, they found themselves in the situation of a peripheral country depending for its technological needs from the 'core' West European area. When the US NATO delegation proposed an embargo on large-diameter pipes, however, this met with British opposition and a lukewarm attitude from lesser European powers. A transnational debate on the nature of oil pipes ensued, opposing military to economic reasons. In the debate, the positions of NATO countries were first and foremost dictated by both the current state of their trade with the USSR and the Cold War two-blocs dynamics. The dispute, which was fought over the possibility of distinguishing between 'strategic' pipes and others, involved diplomats, intelligence and military authorities, and technology experts. What an oil pipe was as a technological product ended up being the result of American hegemony over its peripheral allies, which materialised into US success in controlling European commerce with the USSR.

Session: Technological Innovation, Negotiation And Exchange

EXPERTS IN THE PERIPHERY – AIRSHIP PROPOSED BY BARTOLOMEU LOURENÇO DE GUSMÃO IN PORTUGAL IN 1709

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Abstract

This work analyzes Bartolomeu Lourenço de Gusmão's (1685-1724) case in Portugal in the year of 1709 and his airship.

Bartolomeu Lourenço de Gusmão was an expert and his contribution was ignored in 1709.

This work presents the current state of what is known about the causes why Bartolomeu Lourenço de Gusmão's contribution was ignored and why it was lost seventy three years in the aeronautics evolution till the experiences made by the brothers Montgolfier in France.

The relevance of this work in the context of studies in history of science that have been focused on the definition and the role of experts is to stress the difficulties which arise in the recognition of an expert in a new area of expertise and the possible consequence of the work not be continued.

This work describes the communication made about the airship and the acceptance that communication had, and finishes presenting the known causes why this work did not continue.

From the communication made, we have the petition presented by Bartolomeu Lourenço de Gusmão to the King John V of Portugal asking the exclusivity of the use of the invention, the favorable reply given by the king to his petition, descriptions of the demonstrations to the court, and texts and pictures printed in European countries in 1709.

From the acceptance that this communication had, we have the content of the sonnets about the airship, the content of the pictures printed in Europe, and the position offered by the king to the inventor.

Thus, there were two execution plans: the one of the printed picture, and the one of the demonstrations to the court.

The printed picture was not considered viable. The demonstrations made to the court were not considered viable for the initial aim that was proposed.

From the causes why this work did not continue it is pointed out the specific type of scientific culture at the time in Portugal, Bartolomeu de Gusmão's fear of losing credibility and of losing his rights to the invention, and also the public and military concern with the imminence of an incursion in Portugal.

Session: Technological Innovation, Negotiation And Exchange

MANAGING THE CONSTRUCTION WORK OF RAILWAYS: THE CASES OF PORTUGAL, INDIA AND AFRICA (1850-1910)

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Abstract

Railway construction in the 19th and early 20th centuries required large amounts of labour and capital, skilled engineers, and complex managerial and logistical arrangements. Construction took place in the heart of great cities, in uninhabited, rugged and sometimes disease-ridden terrain, and through every imaginable landscape between those crowded urban and the near empty, wilderness extremes. Deserts, verdant plains and great rivers were crossed, jungles conquered, and mountains pierced by tunnels. By 1900 worldwide trackage exceeded one million kms with an additional twenty-five thousand added by 1920.

Central to the success of this great effort was the mobilization and coordinated utilization of huge numbers of construction workers because on most continents railway building was a labour-intensive activity. In their spatially extended, aggregated totals their numbers likely made them the largest assembly of construction workers focussed on the same task in human history.

The massive numbers of railway construction workers came primarily from the need for a great many unskilled labourers to move earth and rock, to cut and to embank. However, and it is an important caveat, substantial numbers of skilled workers with a range of abilities also were needed for most projects, and most particularly for tunnels, bridges and viaducts.

But how and by whom were these huge agglomerations of labour managed? What kinds of relationships existed between those who supervised the work of railway building and those who provided the labour power needed to build a railway? These are not questions that have straightforward answers. There are patterns and commonalities we can identify but the construction of each railway, or section thereof, had its own configuration and special nuances.

In our presentation we want to show, first, some of the commonalities and then move to the exhibition of a number of specific examples of railway building in Portugal, its colonies and adjacent areas. We particularly draw upon construction in Portuguese Goa (the West of India Portuguese Guaranteed Railway (WIPGR), opened in 1888), in the British Indian Empire, and in Portugal's African colonies (Delagoa Bay, 1886-1890 and Luanda-Ambaca, 1885-1899) for our overseas examples. The lecture continues with an examination of the relationships between labour and those who managed labour forces at the construction worksites, and concludes with a more extended example, the construction of the WIPGR.

Session: Technological Innovation, Negotiation And Exchange

COMMUNICATING ARTISANAL KNOWLEDGE FROM THE EUROPEAN PERIPHERY: IBERIAN COSMOGRAPHERS AND THE EARLY MODERN SCIENCE

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Abstract

In the last decades the history of early modern science has moved from the narrative of the Big Picture to what we call peripheral stories, where the scientific activity of Spanish and Portuguese empires related to navigation, cosmography, and natural history takes on a new dimension.

Following Zilsel's thesis, this paper analyzes cosmographical practices developed in the early modern Iberian World in the light of the theoretical debates about the artisanal origins of European science. More specifically, the aim of this paper is to analyze how the Iberian Peninsula cosmographers did their work. First, that the Iberian Renaissance developed cognitive devices (cartographic models, pilot instructions, and normative texts) that allow us today to tell the expansion history differently, in a manner closely linked to traditional explanations of the roots of European modernity, and their ways of acquiring knowledge. In this sense, the Iberian world provides paradigmatic examples in the general framework of visual, material, and empirical culture of science.

And secondly, that there is a possibility of obtaining knowledge through disciplines hitherto considered auxiliary, and on the need to see artisanal culture not as peripheral culture but to place it in a central position. Attention must be focused on empirical practices and in the work of technical creators actively engaged in the making of scientific knowledge, such as cartographers, navigators, and nautical instrument makers. The main idea is not only to highlight the scientific and technical developments of Spanish and Portuguese in the period of the great ocean voyages, but also to consider its impact in a more global context. In my opinion, the European encounter with new worlds and the navigation through large and unknown oceans made the Iberian cosmography and navigation an extremely fertile field for European Science in modern world.

Session: Technological Innovation, Negotiation And Exchange

A MIRACLE RICE FOR EAST ASIAN CO-PROSPERITY: A TRANSNATIONAL HISTORY OF RICE BREEDING IN EAST ASIA

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Abstract

The modern Japanese empire was strikingly different from other colonial powers because its metropole population consumed rice as a staple grain, as did its colonial subjects. The empire's entire rice production had to meet dual demands in terms of quantity from both the metropole and the colonies. At the same time, it had to satisfy different discriminating palates between the metrople population and the colonial one. Therefore, among the various subdisciplines of science and technology introduced to modern Japan, none could garner the full support of the imperial authorities other than agricultural science, particularly the technology of rice breeding. Against this backdrop, Taiwan became the empire's leading laboratory for new rice breeding experiments in the early decades of the twentieth century.

Would local Taiwanese farmers accept new farming methods that the Japanese agricultural scientists suggested? Could new rice varieties improve the overall agricultural productivity of the empire? Would the Japanese metropole population take new Taiwanese rice varieties as a palatable grain? In other words, Japan's scientific rice breeding projects in colonial Taiwan had to face precisely same challenges that the leaders of the Green Revolution would do decades later when Taiwan became "Freedom's Frontier" during the years of the Cold War confrontation. Thanks to the colonial experience, Taiwanese agricultural scientists indeed played a key role in the era of Green Revolution. Rather than policymakers in the metropole, this paper contends, the logical and practical origins of the Green Revolution should be found in the scientific rice-breeding experiments in colonial Taiwan.

Session: Building and Debating Expertise

PORTUGUESE AFRICAN COLONIES AND A NEW EXPERTISE BETWEEN SCIENTIFIC KNOWLEDGE AND DIPLOMATIC SAVVY (1875-1885).

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Abstract

The late half of the nineteenth-century saw an increased European interest in African territories. In Portugal, the newspapers were filled with announcements and illustrations on the Portuguese colonial presence in Central South Africa side-by-side with news from the latest expeditions into the unknown African hinterland. Contrasting with the peripheral position of Portugal in Europe, Portuguese African colonies occupied a central role in the international negotiations. Consequently, Portugal had to reconsider its African agenda. Colonial administration, territorial negotiations and symbolic representation of Africa became a new area of expertise engaging members of the Portuguese intellectual elite who accumulated expertise in African matters connecting political and diplomatic savvy with scientific know-how and historical knowledge.

This paper argues that in order to sustain the renewed interest for the Portuguese African colonies a new breed of experts emerged, comprising politicians, writers and scientists, already recognized specialists in their own fields, who engaged in interdisciplinary practices, multifarious both in form and content. Specifically, I will look at the work of three individuals, the zoologist and politician Barbosa du Bocage, the diplomat and Minister Andrade Corvo and the writer and secretary of the Society of Geography of Lisbon, Luciano Cordeiro, all involved with the new Portuguese colonial policies for Africa. They all advocated a new program in which the delicate colonial question was to be solved in both national and international arenas. These experts will be taken as case-studies to explore the specificity of experts, and expertise, in a peripheral context, invoking the changing concepts of centre, periphery and ultra-periphery.

Session: Building and Debating Expertise

BOIX Y MOLINER'S *HIPPOCRATES DEFENDIDO* (1711): PROMOTING SPANISH MEDICINE FROM THE 'PERIPHERY' TO THE 'CENTRE'.

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Abstract

In the course of history, circulation of knowledge required and made use of diverse and specific means and strategies of communication. In the beginning of the 18th century, it was the republic of letters, that still determined the exchange of knowledge throughout Europe, whose most common medium was correspondence by letters. Though, new institutions like the royal academies of science and with them the emerging of scientific journals, began to change the ways in which communication of knowledge took place. Situated in this specific turning point – not only by matters of media, but also in terms of scientific content, this paper aims to study the circulation of medical knowledge produced in Spain throughout Europe, exemplified on the book *Hippocrated defendido* (1711) written by Miguel Marcelino Boix y Moliner.

The *Hippocrated defendido* is especially well suited for such kind of analysis, as in its process of transfer various means of communication were involved: first, the controversies and critical responses that arouse after its publication in Spain; second, letters from Paris representing the attention received in the medical-scientific community of France, and finally, reviews of Boix's text that appeared in several journals in Paris and in London, including the *Journal de Scavans*. Furthermore, as the physician Boix y Moliner gathers in his book recent medical ideas from outside of Spain (in particular those of Thomas Sydenham), it can be observed how scientific knowledge circulates not only from the centre to the periphery but also - and this is to be stressed - from the periphery back to the centre. By focusing on the applied strategies and techniques to overcome the difficulties for a 'peripheral' physician to gain access to and acceptance in the republic of letters, this case-study allows to reexamine the dynamics and relations between 'periphery' and 'centre'.

Session: Building and Debating Expertise

'REINFORCED' INTERNATIONAL ALLIANCES BY 'CONCRETE' ENGINEERS: THE INVOLVEMENT OF ELIAS J. ANGELOPOULOS, 1900-1912

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Abstract

This paper focuses on the first steps of the promotion of the technology of reinforced concrete in Greece, by members of the community of local engineers. The key figure is Elias J. Angelopoulos (1859-1932) who had pioneered in the introduction of *béton armé* around 1900, at his capacity as exclusive representative of French company *Hennebique* in Greece between1900-1912. Trained in France as a civil engineer, at the *Ecole Nationale des Ponts et Chaussées*, Angelopoulos was also the leading member of the nascent Greek engineering community. In addition to holding the influential post of the director of public works in the Athens municipality, he was the co-founder of the first association of Greek engineers (*Greek Polytechnic Association*), the editor and founder of the first Greek engineering journals (*Mechanical Review*, *Archimedes*), and the driving force behind institutions of technical education, engineering and other.

This paper discusses interactions between Angelopoulos and the nascent community of Greek engineers, the French community of civil engineers and the emerging Greek cement-industry regarding in modes of the management and the appropriation of a specific innovative technical knowledge. Through the pages of Greek and French engineering periodicals and newspapers, Angelopoulos formed alliances with Greek and French engineers and industrialists in order to promote the use of reinforced concrete. While constructing these 'concrete' international and local alliances, Angelopoulos placed an emphasis on reinforced concrete as a material coming from the technologically and culturally advanced Europe. Parallel to this, Angelopoulos was advancing his role as one of the main local experts for this new technology in order to appropriate the French technical knowledge of reinforced concrete to the particularities of the Greek construction field. While experimenting with the actual use of reinforced concrete around the country, Angelopoulos was advancing a new role for the expert scientist-engineer, that of the consultant of industrial and other enterprises.

Key words (Appropriation of technological knowledge, reinforced concrete, expertise, the technical publication, public images of technology)

Session: Building and Debating Expertise

COMPARATIVE ANALYSIS OF PROBLEM INTERPRETATION IN ENVIRONMENTAL GOVERNANCE

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Abstract

Excellent studies of science-policy interaction exist but the existing data rarely allow the comparison that is needed for theory-building because they are mostly single case studies that do not share a conceptual framework. This paper explores whether and how such a conceptual framework may be established. The single most important finding from existing studies is that knowledge is only actioned upon if it can be translated to become meaningful in the context in which action needs to be taken. The paper presents a new multi-level framework for comparison of (inter)national science-policy architectures. The ultimate goal is to translate interpretivist research into policy practices into a formal ontology-based context model that 'follows the knowledge'. It is proposed that the European Union (EU) provides an ideal setting since countries are subject to the same environmental policy regimes yet respond differently in their implementation activities. This means that the external context is the same, and differences can be attributed to national and local contexts. Data collection should focus on southern and eastern countries since these are less represented in existing science-policy interaction studies. The Water Framework Directive (WFD) is especially suitable as case for three reasons. Firstly, the implementation is relatively advanced, which means that there are many cases where translation of knowledge into concrete projects has occurred. Secondly, there is a plethora of technical guidelines available in the Common Implementation Strategy, the use of which can be traced in these projects. Thirdly, the WFD goal of 'good ecological status' requires multiple translation steps before concrete action can be taken in a specific locality. This provides an opportunity to study who is involved in this translation, how and for what reasons. With my presentation I am looking for feedback and to establish a network of collaborators across Europe.

Session: Teaching and Displacing the Sciences

NATURAL HISTORY COLLECTIONS AND TEACHING PRACTICES IN PORTUGAL (1836 - 1975): A METHODOLOGICAL APPROACH

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Abstract

Teaching materials are evidence of scientific and pedagogical culture that formed the school practices. Taking as a starting point the natural history collections of Portuguese secondary schools, and tracking them backwards through the nineteenth and twentieth centuries, this paper aims at using collections to uncover new aspects of science teaching in Portugal, in a time when secondary schools, where science was taught, multiplied across Europe. In Portugal, natural history museums and collections associated with secondary schools are still largely unknown. Many schools hold important collections that have remained almost untouched for decades. They are inaccessible for research and the general public. Most frequently they owe their conservation to some individual teacher's personal interest.

Collections and scientific instruments have recently become a central source for historians of science alongside with the more commonly used scientific and technical written documents. While important aspects of scientific practice certainly are embodied in this material culture of science, its study raises, nevertheless, huge methodological challenges. In this context, the present paper draw from a recent conceptual and methodological framework proposal for documenting collections, to reflect on the challenges we face when we use material culture in our historical approaches to science teaching in Portuguese secondary schools.

In order to understand the importance of these collections over time, until today, collections needed to be related to the contemporary written sources that describe such collections and their use. These comprise legislation, governmental directives, curricula, inventories and teacher reports in order to determine their origins, development and use. This study reflects the varying status of science during the nineteenth and twentieth centuries, a period that encompassed a monarchy, a republic and a dictatorship in Portugal, and also allows to highlight the importance of circulation, local exchanges and global networks in the construction of special spaces for teaching science.

Session: Teaching and Displacing the Sciences

THE IDEA AND DEVELOPMENT OF THE ENGINEERING SCHOOL IN ESTONIA DURING 1920-1930

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Abstract

The first permanent technical educational institutions in Estonia were maritime schools. Tallinn Technical School began training engineers as a private school of the Estonian Technical Society in autumn 1918. It was possible to study machine engineering, electrical engineering, shipbuilding, hydraulics, civil engineering and architecture. Later, land improvement and technical chemistry were added. The lecturers were Estonian engineers and technological researchers, educated in Riga, St Petersburg and Germany (Darmstadt, Karlsruhe etc). In the mid-1930s, the revitalisation of economic life after the crisis was expressed as considerable changes in the structure and output of the industry; the positive impact of the crisis was evident in the reorganisation and modernisation of industry, leading to a smoother stabilisation later on. The chemical industry, above all, the oil shale chemical industry, expanded the fastest. The strong intensification of production required engineers with appropriate training. The Chamber of Engineers, created for protecting their occupational interests, considered as its primary aim the preparation of a new generation of engineers. In 1936, the Tallinn Technical School was turned into a technical institute that was granted university status. The decision significantly enriched the cultural image of the state. Estonia had now two universities – one in Tartu, the other in Tallinn. The Tartu technical department was merged with the Technical Institute. A large number of technical students studying in Western Europe returned home in order to continue their studies. In 1938, the Technical Institute was renamed the Tallinn University of Technology. In light of the importance of mining industry in the growing state economy, the training of mining engineers began. In relation to the expansive electrification of industry and farming, the training of electrical engineers was thoroughly reformed. The experience of the technical universities of England, France, Germany and Switzerland was followed in developing new study programmes.

Session: Teaching and Displacing the Sciences

THE HISTORY OF SCIENCE ON SHOW. A CASE STUDY OF THE EXHIBITION *360º SCIENCE DISCOVERED*

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Abstract

This is a presentation of the principal results of a case study on an exhibition which illustrated the encounter of the history of science with certain forms of cultural production. The exhibition in question was *360º Science Discovered*, at the Calouste Gulbenkian Foundation from March to June 2013, curated by a history of science researcher and cultural intermediary specialising in curating exhibitions. This show was exceptional in terms of its main objective, which was to offer, in the curator's words, "an untold history", a history of the contributions which Portuguese and Spanish fifteenth and sixteenth-century ocean-going explorers made to scientific and technical development. This exhibition, it can be said, is part of a movement to recover the visibility of the Iberian role in the historiography of science.

The following aspects were covered in the analysis of this specific method of disseminating science – an exhibition with scientific content, with a relationship to art: i) origins and institutional framework for the exhibition; ii) profile of the curator and how the show related to his research work; iii) the educational programme provided for visitors to the exhibition (type of instruction provided and partnerships with science museums). The chosen methodology favoured documentary analysis and the interview.

In the context of the educational programme and the cultural mediation involved, we were particularly interested in understanding the approach to the topics and organizing principles of the exhibition – such as the idea of 'novelty' (a new image of the world, new forms of nature, new disciplines) – in the design of the activities and talks for visitors. It should be noted that the team assembled for the exhibition's educational programme was made up of mediators who work in science museums and other colleagues from the arts world. This was a multidisciplinary team, and it is this factor which justifies our study of the show. We saw the encounter of science and art as an interesting platform for observing the methodologies and practices of cultural mediation.

Session: Teaching and Displacing the Sciences

SCIENCE, LITERACY AND PATRONAGE IN THE TRAJECTORY OF THE TEXTBOOKS WRITERS OF THE ROYAL MILITARY ACADEMY

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Abstract

The arriving of the Portuguese Royal Family in Brazil in 1808 not only moved the political center of the Royal Empire from Portugal to the tropics but hardly modified both the cultural and scientific practices in Brazil. In the case of the exact sciences, the permission for printing in the Impressão Régia in 1808 and the beginnings of the Royal Military Academy in 1811 implied in the publication of a series of books in order to supply the pedagogical demands of the new Academy in Brazilian soil.

Based on an exhaustive list of books produced for the students of the Academy during the monarchic period (1808-1889) and a prosopography of their authors and translators, we would like to discuss some local aspects of the mathematical practices.

It is plausible to affirm that these textbook writers were army officers, professors in the Academy, but also journalists and politicians with some connections with the Imperial Court. Moreover, the translating is an activity which bridges mathematical practices with both literacy studies and journalism. Yet this connection is stimulated by the war minister and the imperator, which want develop their teaching institutions. Therefore, the favor and the patronage are important characteristics of the productions of these texts and the scientific practices are very attached to the political dynamics in the court.

Secondly, the majority of the translated texts came from France. In doing so, we see France not only disseminating their own new concepts but from other scientific centers in Europe. Besides, preliminary results suggest that some books produced by this intellectual group, sometimes printed in Brazil, sometimes in Europe, were also sold in Europe, indicating a reflux of texts from periphery to some European centers.

Some study cases will be developed along the exposition.

Session: Images, Models, And Representations Of Science

CEMENT, TECHNOLOGY, MODERNIZATION AND BUILT UTOPIA: MACEIRA-LIZ AS MODEL FACTORY 1918-1933

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Abstract

This communication focuses on the utopian character of Maceira-Liz cement factory during the First Republic period in Portugal (1920s). I showcase here how technology held the promise of overcoming the deep social and economic crisis afflicting this nation state in the aftermath of the First World War.

In the final years of the conflict, civil engineer José Osório da Rocha e Melo and businessman Henrique de Araújo Sommer decided to build the most modern cement production factory in Portugal. They draw on the most innovative technologies available in Europe at the time, as proved by the fact that all contractors hired to equip the new plant were of German origin. The site's choice – the isolated rural countryside Gândara territory – was determined by locally existing high quality raw materials in enough quantity to guarantee production for a large timespan. Usually associated to a sandy wasteland, and in spite of adverse and unwelcoming conditions for everyday life of workers or technical staff, in-site building work started from scratch in 1920, coping with the absence of all infrastructures, from communication routes to labor force.

The paper explores how the factory embodied the Utopian ideias of its promoters. Utopia has emerged throughout western history in times of crisis, many times following war conflicts. Mental constructions of perfect ideal societies are usually imagined as lines of flight from harsh realities, as repairing strategies to overcome periods of trauma. The actors' idealization of this site and the corresponding building process was intended as a solution for tackling national industry problems, and as a significant contribution to improve national economy. Situated in the rural countryside of Portugal and associated with isolation, poverty and infertility, this factory and social site was later to be considered by the 1930's Estado Novo regime as a role model of prosperity, innovation and modernization, to become an 'island of perfection' in a political, historical and economic environment dominated by an alleged weak and disorganized nation state.

Session: Images, Models, And Representations Of Science

THE MANY LIVES OF AN IMAGE OF SCIENCE. THE EXAMPLE OF THE 'AULA DA ESFERA' AT THE JESUIT COLLEGE IN LISBON

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Abstract

Images of science can have many lives. They are created within specific settings and in particular formats. Then they are re-appropriated in different subsequent contexts and are recast into new forms. Their meaning, of course, changes, too. We argue that the trajectory of these re-uses of the 'same' image affords us with insights not only into scientific debates but also into the changing status of science in a society. To illustrate this idea, we will trace the history of one image that has lived and still lives in Portugal. It started its career between book covers as the frontispiece copper engraving of a textbook, Ozanam's *Dictionnaire mathématique ou idée générale des mathématiques* (Amsterdam, 1691). It was reused in and adapted to Prestet's third edition of *Nouveaux elemens de mathématiques* (Paris, 1694). The engraving displays a complex allegorical composition. Personified Geometry is teaching two figures representing Fortification and Navigation, and symbolically passes them the keys to knowledge. From this situation the image 'migrated' to a different context and acquired a new format: as a tile (*azulejo*) panel for wall decoration in a lecture hall for mathematics (new facilities to host the 'Aula da Esfera' at the Jesuit Santo Antão College in Lisbon, built in the 1740s).

In the 20th century this tile panel was discussed in scholarly books on Portuguese art history and in studies on the history of education. Sanctioned by this scholarly appropriation, then, the image becomes capable of 'iconic' use by evoking a vague idea of Portuguese scientific traditions, now disconnected from its origin: the photograph of the tile panel is used, for example, on a flyer of the Portuguese Science Foundation FCT (2006) or on the façade of a private clinic in Coimbra (2007-2012).

This image initially came from settings which were central to scientific practice. The contexts of its late re-uses are peripheral to the production of science. Here, we suggest, it has become largely independent from its initial semantics. Its success reflects an attempt, in local public discourse, to present a fresh image for symbolizing Portuguese scientific endeavour. The latter was long associated with images referring to the naval discoveries. While less familiar, the new image – by featuring the typical *azulejo* technique – nevertheless conveys a sense of national identity.

Session: Images, Models, And Representations Of Science

PSIQUIATRIA SOCIAL (1931): MENACING REPRESENTATIONS OF MADNESS AS RHETORICAL TOOLS FOR LEGITIMIZING PORTUGUESE PSYCHIATRY

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Luís Cebola (1876-1967), was a Portuguese psychiatrist best known for being the Clinical Director of the Casa de Saúde do Telhal (CST) from 1911 to 1948. CST, established in 1893, was a private hospital dedicated to the care of the insane, belonging to the religious brotherhood, Ordem Hospitaleira de S. João de Deus, and located in Sintra.

In addition to his medical career, Luís Cebola was also a prolific writer and poet, publishing twenty-three multifaceted books during his lifetime. He also wrote several papers for the Portuguese press dedicated to the popularisation of medicine, focusing mainly on the socio-political aspects of untreated madness, and the legitimation and development of the psychiatric profession in Portugal.

In *Psiquiatria Social* [Social Psychiatry] (1931), Cebola compiled several articles previously published in a Portuguese daily newspaper. In this anthology, pervaded by eugenic ideas and a mental hygiene agenda in harmony with the prevailing clinical ideology of his time, Cebola pinpointed the main social threats resulting from the proliferation of mental illness, and identified the several pathologies responsible for menacing social balance. He also advanced a number of recommendations for altering and improving the Portuguese psychiatric clinical system, which would allow for controlling the spread of mental illness, and maximise the probabilities of health recovery.

Our presentation aims to identify the main representations of madness and the resulting psychiatric and social concerns suggested by Luís Cebola throughout this work, relating them to the state of the art of Portuguese psychiatry at the time the book was published. We also propose to determine the extent in which such clinical concerns were here used as rhetorical tools by Cebola, a representative of a recently formed class of medical professionals, in an attempt to improve psychiatry's clinical and social credibility and authority.

Session: Images, Models, And Representations Of Science

OBSERVATION AND COMMUNICATION OF THE EXOTIC NATURAL WORLD IN THE PORTUGUESE ACCOUNTS OF *"HISTÓRIA TRÁGICO-MARÍTIMA"*

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Abstract

Between the 15th and 17th centuries Portugal has undertaken a number of trips overseas that allowed the discovery of new worlds and news about new cultures and exotic flora and fauna started to emerge. The records of long-distance oceanic voyages in these centuries are an extremely rich repository of information on the observation of the natural world. From the maritime experiences, reports multiplied and led to increasingly accurate information about what was observed during these trips. These reports were very important for the construction of natural knowledge in the 16th and 17th centuries, where what was first seen was constantly compared to what was already known, based on the inherited notions of the past to.

The Portuguese accounts of *História Trágico-Marítima* is a collection of narratives related to the several shipwrecks that occurred in *Carreira da Índia* between 1552 and 1602, compiled and published in two volumes in the years 1735/6 by Bernardo Gomes de Brito. In these reports the natural elements are a constant presence and are described in more or less detail, including birds, marine mammals or floating marine plants or algae that passed by with the currents. In these records we can find birds that are signs of land, whales seen as bad omen of shipwreck or fish hunted for food. These descriptions and the significance given to these encounters vary according to the authors, some of them familiar with the classical authors such as Aristotle and Pliny. Sometimes these descriptions are even the only written available testimony of what had been seen during these trips. Some of this information reaches Portugal before the publication of *História Trágico-Marítima* and spreads across the country through pamphlets or letters of Jesuits priests. These letters were sent to the order to report what happened during the missions.

The process of observation at sea is structurally very complicated and it is necessary to imagine what you do not see or see only partially or briefly. In the case of marine animals, when they are observed, this observation is almost always partial and very elusive and it is essential to make a mental reconstruction of the whole, which will also vary depending on the person who does it. More or less fanciful compositions that originated several stories about great sea monsters depended upon prior existing information about what could be found at sea and the information contained in some classics begins to be questioned after these trips.

The study of these records provides very important insights into how the acquisition of knowledge about nature is deeply determined by local conditions and by the set of circumstances (like shipwrecks) that surround the very act of observing nature. They provide relevant information for the analysis of the processes of constructing natural knowledge in early modern Europe.

Session: Objects, Collections and Controversies

THE STONES AND BONES SHOW: SCIENTIFIC CONFERENCES IN ARCHAEOLOGICAL CONTROVERSIES IN THE 1990s

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Abstract

Sociologists of science have used the idea of "tools" as elements employed by historical actors during scientific controversies to reinforce their position. Professional prestige, publications, media, foreign authorities or history of science are some instances of resources used in scientific struggles. Archaeology and paleoanthropology are sciences based on material evidence extracted from sites geographically located. Controversies in these sciences often deal with stratigraphy, dating or human agency in which the actual knowledge of the site is crucial. Often practitioners arrange tours in order to show their colleagues their first hand evidence.

Using two 1990s scientific controversies on those sciences, this paper wants to highlight how the involved scientists used scientific conferences as "tools" to "convince" their audience of their disputed claims. In December 1993, the Piauí region, one of the poorest of Brasil, hosted an international conference in the Serra da Capivara national park, where controversial evidence of the "first American" was claimed by French-Brasilian archaeologist Niede Guidon and her team. In September 1995, the Spanish little rural town of Orce host a major conference organized by the team leaded by the Catalan paleontologist Josep Gibert. After more than ten years of dispute, Gibert wanted to finally establish among the scientific community that this part of Spain held the remains of the "oldest European".

These were conferences arranged as great "shows" directed not only at colleagues but also at the public sphere, politicians and local inhabitants. Major scientific figures traveled to these isolated and poor regions. Site visits and displays of remains were also a crucial "tool" in the "spectacle". Paradoxically, these visits gave enough knowledge to experts to be convinced but not enough to criticize. This paper will try to understand the complex geographical, economical and authoritarian relations between controversial claimer scientists, their site and the international invited scientists.

Session: Objects, Collections and Controversies

CONSTRUCTING BELGIAN ANATOMICAL SCIENCE: COLLECTIONS AND INTELLECTUAL PROPERTY (1830-1860)

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Abstract

Conflict about property was a recurring topic in Belgian anatomical cabinets during the nineteenth century. Anita Guerrini has shown how the dispute about ownership of anatomical collections in the early modern period also revolved around 'intellectual property'. Though the question of ownership has often been evoked in relation to the 'gift' of preparations, there has rarely been a focus on the aspect of 'intellectual property'. This paper investigates the debate about property within the context of the development of a Belgian anatomical science, and the significance attached to intellectual property. Notable absentee in the debate about ownership were the relatives of the people whose bodies were the subject of autopsy or dissection.

After the reorganisation of the higher educational system in 1835, the state acquired all property rights of collections at state universities. At the University of Ghent, the regulations of the anatomical theatre stated that professors were obliged to depose preparations at the university's anatomical cabinet. By doing so, they gave up any claim of revendication. The professor did, however, retain the ownership of the observations of pathological lesions. In this context ownership consisted of a form of 'intellectual property', even though it was not named as such.

Preparations were connected to intellectual labour and individual prestige. They were the result of a personal - sometimes secret - technique and were perceived as an expression of talent. Preparations were therefore often associated with a certain individual. This became more clear in the presentation of a preparation to a scientific audience, and its subsequent publication. Even though the state possessed all property rights, the role of the individual would stay essential when communicating about these collections. The disputes regarding property did not only concern ownership, but involved questions of prestige and changing ideas about scholarship as well.

Session: Objects, Collections and Controversies

ARCHAEOLOGY AND PREHISTORIC STUDIES IN ANGOLA DURING PORTUGUESE COLONIALISM: THE DUNDO MUSEUM

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Abstract

The Board of Geographical Missions and Colonial/Overseas Research (1936-51/1952-1973) introduced a new chapter in the production of scientific knowledge in and about the territories under Portuguese jurisdiction. Its current successor, the Tropical Research Institute, shelters an array of documentation related not only to the different Missions woven by the Board but also to the scientific research led in the former colonies by local entities. Such is the case of the Diamond Company of Angola - Diamang - and its Dundo Museum.

Located in Lunda-Norte, the Dundo Museum was created by Diamang in 1936. Initially conceived as a device of ethnographic nature, other scientific domains were covered by the enhancement of the activity of Diamang, namely through the mining prospection that brought to the surface archaeological data.

By the hands of José Redinha (1905-1983), the Curator of the Museum, and the Head of the Prospecting Services, the Belgian geologist Jean Janmart (?-1955), prehistoric studies were conducted in Angola, also following the Resolutions passed by the First Pan-African Congress on Prehistory (Nairobi, 1947).

As a result of a prolific scientific exchange, often in the form of fieldwork conducted in collaboration with leading figures of African Archaeology such as Louis Leakey (1903-1972), Henri Breüil (1877-1961) and John Desmond Clark (1916-1972), nine numbers of the Cultural Publications of Diamang were dedicated to Prehistoric Archaeology.

This communication aims to explore the role of the Dundo Museum in the production and circulation of archaeological knowledge in and about Angola during Portuguese colonialism. In doing so, it is also its intention to disclose the related documentation in the custody of the Tropical Research Institute.

KEYWORDS: Archaeology; Angola; Dundo Museum; Portuguese Colonialism.

Session: Objects, Collections and Controversies

THE GEOPHYSICAL COLLECTION AT THE UNIVERSITY OF LISBON: A CONTRIBUTION TO HISTORY OF THE METEOROLOGICAL OBSERVATORY OF INFANTE D. LUIS

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Abstract:

In mid-19th century Europe a growing interest emerges in understanding the physical phenomena of Earth such as weather, terrestrial magnetism, solar activity and earth movements. Alongside the establishment of a coherent theoretical framework for the construction of these new scientific disciplines (meteorology, geomagnetism and seismology) there is a need to collect as many as possible data observations from the widest possible geographical area in order to determine patterns of behavior. In this context, a movement emerges of creation of observatories and networks with the purpose of data collection and research for these new disciplines.

In Portugal, the first institution of this kind was the Meteorological Observatory of Infante D. Luis created in 1853 at the Polytechnic School of Lisbon. Its main purposes were to collect data and develop scientific research, but also teaching. To this end, various instruments were acquired and used; most are today in the collection of the National Museum of Natural History and Science (University of Lisbon). Many were acquired abroad and adapted locally. These historical instruments are thoroughly documented and they are crucial to understand multiple dimensions of the history of meteorology in the late 19th century and early 20th century. In this paper, I will outline the collection profile, such as the chronological scope, purposes, users and practices; and then highlight some instruments in terms of acquisition, use, technique and users. Finally, I will discuss the importance of studying this collection in order to construct a more accurate history of the Observatory. The cross-examination of documental, material and iconographic sources enables a better understanding of local adaptations of equipment and practices, acquisition dates and knowledge transfer at the early stages of the Observatory, which in turn will shed light into its role in the international scientific networks of meteorological and geophysical sciences.

Session: Critical Points

ASPECTS OF CRITICAL APPROACHES TO SCIENCE AND TECHNOLOGY.

"Critique of Science" group

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Abstract

The group "Critique of Science" was formed by a small team of Greek historians and philosophers of science in 2012, with the aim of articulating an agenda of criticism concerning various aspects of contemporary knowledge production, by taking into consideration a number of social, political and ideological contingencies, which have been playing a dominant role in the production of knowledge. One of the main goals of the group is to develop approaches for criticizing not the applications of science as such, but the processes and the presuppositions that bring about what is generally accepted as "neutral science." One of the group's basic working hypotheses is that the processes of production of "pure science" are as ideologically and politically motivated as those of "applied science." The group has been attempting to analyze specific cases within the Greek context. To this direction, the aim of this paper is to study the multiple roles and significations of science and technology within the context of a deep economic, social and political crisis, as it is experienced in Greek society today. In this venture, specific examples will be used; among other things, the crucial role of the public hygiene sector, the use of technological means for political suppression, the issue of immigration and the construction of the identity of the "dangerous Other", the domination of technocratic governments and economic-centered policies, will all be discussed. We will argue that political and ideological judgments are being integrated in the new scientific and technological worldviews which are contributing to the emergence of these social policies.

Session: Critical Points

GENDERTIME: HOW TO ASSESS GENDER EQUALITY AMONG RESEARCHERS ACROSS EUROPE?

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Abstract

This paper is based on the results of the project GenderTime "Transferring Implementing Monitoring Equality" funded by the EU under FP7 from January 2013 to December 2016 (see www.gendertime.org). The project consists in implementing "gender action plans" (GAP) in various scientific institutions across Europe, institutions differ in terms of size, disciplines, etc. from small research institutes to huge pluridisciplinary universities.

Beyond the implementation of GAP, the project reflects on common tools to describe and to measure the situation in each institution, on the possibility of comparisons and on the aims of such comparisons. The paper will focus on the tension between the attention to each local context and the attempt to propose a cross-comparison and common indicators.

At the time of the conference, three sets of cross-comparative analysis have been attempted: first a common survey implemented in April-June 2014, second the comparison of the different GAP from a place to another, and third the first elements to build a common framework for quantitative analysis of basic data about the participation of women in terms of positions, salaries, disciplines, status, work contract, promotions, etc..

First historiographical and methodological issues will be developed from the questions raised through those various sets of cross-comparative analysis. We will show how the comparative perspective highlights new issues but is also, in some cases, completely blind to important local issues.

The paper will conclude with the coming research agenda in GenderTime as the project is under progress.

Session: Critical Points

THE WEST HAS KNOWLEDGE, THE REST HAS BELIEFS. HOW CAN ONE ESCAPE FROM THIS CAGE?

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Abstract

I begin by highlighting that it is through the exercise of ontological politics that Western realities become "the reality" and other people's realities merely configure different interpretations of reality. It is a widely held Western belief that the West (no longer a geographic place) has knowledge, while other people have mere beliefs about reality. This kind of Western common sense results from a specific ontological political perspective adopted in the production of modern scientific knowledge. How can a researcher in the periphery help people find lines of flight from this cage where hegemonic Europeans (no longer a reference to nationalities) have knowledge while other people have mere beliefs about the real world?

Limiting myself to the specific historic case of Brazil, I proceed by suggesting a way to approach answers to the question above based on the anthropophagic metaphor of the Brazilian modernist movement of the early 20th century. Its motto was "eat the foreign!" That means not rejection but rather maximum selective absorption. The suggestion involves rescuing the motto of the original European enlightenment – "*Sapere aude*!" which translates as "Dare (to use your own reason) to construct your own knowledge!" – into an anthropophagic scenario. In the case of the European Enlightenment of the 17th and 18th centuries, the independence claim was towards granting respect and space for knowledges challenging what the sacred texts said. In the Brazilian case of the 21st century, escaping from the cage will involve the courage to create modes of existence that challenge the rule of Western technoscience.

I conclude by referencing to and very briefly pointing at a few different examples: reverse engineering of an Apple machine, a minicomputer market reserve, popular knowledge about feeding children.

Session: Critical Points

A CORE MODEL FOR THE SOCIAL AND HISTORICAL SCIENCES: CENTRES AND PERIPHERIES

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Abstract

The centre-periphery pair, as the very existence of the STEP society demonstrates, still dominates the historiographical debate, notwithstanding increasing criticism. The centre-periphery pair provided an abstract scheme, especially useful for historical and social sciences to think spatially of phenomena of diffusion and hierarchic structures. Despite the role played by such a conceptual tool, it was not made the subject of a thorough investigation per se. We think that it is time for an appropriate consideration to be given to the history of this concept.

Our contribution is based on a research still in its infant state, and is intended to shed light on the meaning of this conceptual pair, investigating the history of different disciplines in the social and historical sciences over the 19th and 20th century, and stressing key moments of the fortune of the centre-periphery pair. How did these geometric concepts come to be a metaphor for social phenomena? After carrying out a brief survey of the occurrence of the centre-periphery opposition, we will introduce two significant cases that, although not exhaustive, outline interesting dynamics.

We will examine how the centre-periphery pair has been used in analysing empires, which are complex political and economic entities. We will begin with the approach of historiography in the 19th and 20th century toward the interactions between Rome and Roman provinces, to conclude with the recent interpretations on the political and cultural relationship affecting Persepolis and the peripheral entities within the Persian Empire.

The age of colonial empires also witnessed the rise of the pair centre-periphery in economics. The economic centres of the World produced technological innovation and wealth, and radiated investments onto distant peripheries. The German school of economic geography, between the end of the 19th, and the first decades of the 20th century, building on the legacy of Johann Heinrich von Thunen, devised the theory of central places, while the Argentinian economist Raul Prebisch classified economies as “core”, and “peripheries”, paving the way for innumerable theories of development and dependence.

By examining such historical cases we want to expose the roots of an interpretative model that - although now increasingly under attack - has resisted for very long time at the core of social and historical sciences, including the history of science and technology. We believe that our effort will be of interest for the whole community of STEP members.

Session overview

9th STEP Meeting / Portugal • Lisbon, 1-3 September 2014

Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

Questions of language use for scientific communications have growingly attracted attention of historians of science and scholarship. Be it the history of metaphors, translations, coining of new terms and terminological systems or struggles for "own" scientific tongue, this interdisciplinary enterprise has shown that the textual level of scholarly activity well deserves attention as factor shaping science as we know it.

Questions of translation have inevitably put scientific periphery at the centre of this inquiry, especially since Jurij Lotman's assertion that it is exactly non-central part of communicational systems where innovation takes place, but is hindered by hierarchical orderings. Our session takes exactly this point of view to show on the example of Central Eastern Europe how the question of scientific language was dealt with in a peripheral region characterized by hegemonic language system and multilingualism. After the demise of Latin, German as language of high education took priority in the Habsburg Empire, being, however, more and more contested by Czech, Hungarian or Polish. While after the WWI in the new national states these languages were now fully supported by the state, Ukrainian remained a contested language, both in Poland and in Ukrainian SSR. By taking a longue durée perspective, stretching from 1750s and Johann Sigismund Popowitsch's / Janez Žiga Popovič's proposal for a Slovenian-based universal language in geography and botany to the question of post WWII bilingualism in atom energy facilities in Soviet Ukraine, our section asks in which way scholars in this multilingual scientific settings dealt with multitude of spoken and written languages.

Session: Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

BETWEEN SURGEONS AND PHYSICALS: WHO IS THE AUTHORITY HERE? DISPUTES ABOUT NATURAL HISTORY COLLECTING IN 18TH CENTURY NEW SPAIN

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Keywords: Surgeons, physicians, material culture, collecting practices, natural history collections

Abstract

In Mexico City, the *Archivo General de la Nación* preserve an important amount of documents written in the context of the Botanical Expedition arrived in New Spain at the end of 1787. The archive, made up of personal letters, inventories and different notes, contains two files named *Discordias entre el director del Jardín Botánico Don Martín de Sessé y el naturalista Don José Longinos Martínez. 1789-1790,* and *Sigue el asunto de las disensiones entre Sessé y Martínez, 1790-1795*. The documents gathered by Martín de Sessé, physician and director of the Expedition, were used to report to the authorities in México and Madrid the insubordination of the surgeon and naturalist José Longinos Martínez, and to explain why the Expedition had suffered a breakage. Apparently, the letters just recounted what could be understood as a fight of egoes and a personal disagreement; but it was not so simple. Beyond the personal differences, what was in the center of the dispute between the physician and the surgeon was a fight for authority, validation of knowledge, and for the social and academical recognition of their personal capacities to make science. Starting from the premises of social studies of science, my aim is to explain how the human factor, personal interests and intelectual passions impact on scientific facts as the taxonomical establishment of consensus or the manipulation of animal bodies, as well as on historical facts as the creation of the novohispanic cabinet of natural history.

Session: Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

WORKING AS A CHEMIST ON THE OCCASION OF A VOLCANIC ERUPTION

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Abstract

During my studies in the history of chemistry of the Kingdom of Naples in the 18th century, I found a number of chemical inquiries in papers published to describe the eruptions of Vesuvius. I was really amazed by the fact that a frightful event such as a powerful volcanic eruption had the immediate effect of giving a strong impetus to the debate among the chemists.

The aim of the paper is to give a sample of this variegated range of publications, by which we can take a lot of interesting information about the uses of chemistry in Naples, but we can also face the rich series of figures that employed chemical reflections in their "relationship" with the Volcano.

The core of my presentation is represented by how the explosions of Mount Vesuvius constitute a noteworthy episode in the public perception of science, because scientific ideas, I mean for example the Chemical Revolution, were debated and popularized by a gardener as well as by a professor of the Royal University. To do it I will present some different publications on the same eruption, by very different authors, and their main chemical references.

It would be a starting point to show how chemical information was accepted or understood by the public or government officials and how the Neapolitan volcanic area created a cultural background characterized by frequent references to these chemical inquiries.

Session: Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

FROM ONE PERIPHERY TO ANOTHER? G. A. BRUNELLI BETWEEN ITALY, PORTUGAL AND THE AMAZON

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Abstract

The rich and complex Italian-Portuguese relations during the 18th century provide a wealth of problems to historians: shifting diplomatic interests and strategies, the relationship between Crown and Papacy, trade patterns, questions related to national allegiances inside religious orders, to name but a few, have arisen scholarly interest. Cultural exchanges have by no means lagged behind, with a number of studies focusing on Italian influences on the *estrangeirado* movement, artistic models and commissions, or the general problem of a Catholic Enlightenment in regions that may be construed as peripheries of some kind. When it comes specifically to scientific exchanges, it is well known that a great many Italian experts have been at service to Portuguese interests in several institutions and different parts of the empire: Italian astronomers, surveyors, naturalists and mathematicians can be traced from Coimbra to the Amazon. In this paper, we investigate the nature of these connections from the point of view of the career of Bolognese astronomer and secular presbyter Giovanni Angelo Brunelli (1722-1804), who was one of the main envoys of the Portuguese Crown to survey the Amazon in the frontier-demarcation works that followed the Treaty of Madrid. After living in South America from 1753 to 1761, Brunelli remained in Lisbon until 1769, becoming a professor of mathematics in at least two institutions that operated under direct royal patronage. His extensive and largely unexplored correspondence with Portuguese and Italian patrons and clients, aspiring Bolognese mathematicians or a Portuguese architect operating in Italy, among others, offers a detailed glimpse of an actor's perspective on the experience of being an expert moving among peripheries in the second half of the 18th century, including his own alleged motives, interests and even perceptions of a “non-central” condition.

Session: Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

PERSONAE CROSSING THE POND. BELGIAN SCIENTISTS REPORTING ON THEIR JOURNEY TO AMERICA, 1920-1940

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Abstract

"I think that, for physiologists, a sojourn in America is the only way to get in contact with the very original contribution of American physiologists of today."

This observation made by the Liège physiologist Marcel Florkin in 1929 was not lost on his colleagues: in the Interbellum the United States became a preferred destination not only for physiologists, but for Belgian scientists in general. This meant a shift in centre of attention for peripheral Belgium. Belgian science and culture had always taken pride in its receptiveness of French and German influences. The US took over: new methods, techniques, instruments and scientific theories went across the Atlantic. Science thus Americanised, but did scientists do too? Did persons visiting the States also mean personae crossing the Pond?

The Belgian American Educational Foundation (BAEF) offers the opportunity to study travelling scientific identities. The BAEF funded two visits by Florkin to the US, as well as that of hundreds of other scientists, aiming to serve the scientific exchange between Belgium and the US. The BAEF kept an eye on its fellows, for instance through the reports each fellow had to write. These reports – Florkin's quotation stems from one – show how the fellows perceived American scientific culture, and how they were impressed by its gender roles and democratic organization.

In my paper I will discuss three groups of scientists: physiologists, social scientists and historians. I will scrutinize their reflections on the scientific personae they encountered in the US as well as the identities the Belgian scientists themselves communicated. Three types of sources, each directed towards a different audience, will be used. The reports to the BAEF serve as a starting point. More important are the published travel accounts, directed at colleagues and the personal correspondence, written for a small audience.

Session: Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

PURISM AND INTERNATIONALISM IN LATE 19TH CENTURY POLISH SCIENTIFIC LANGUAGE: SEARCH FOR "OWN" SCIENCE?

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Abstract

In the late nineteenth century, a number of publications argued for purification of Polish terminology from foreign influences. Imperial situation, meant the authors, made Polish science heavily dependent on foreign languages, especially German. The proposed solution was to cleanse foreign words from the terminology and in this way to create slavic scientific vocabulary presenting cultural productivity of Poles to the world. Dictionaries and treatises were produced in which this terminology was proposed and discussed, predominantly in the than vital chemistry of technology studies.

In my talk I analyze this movement on the crossroad between nationalism and trends in philology and philosophy of science of the time. Although nationalism-driven discussions of purity of scientific language had their long history, late 19th century is a time when the need of internationalization of knowledge is well acknowledged and the argument of why the language is to be pure does not have the argument of science being understandable to the folk at the front position it had before. It is rather an epistemological argument of science as supra-structure in which multilingual sciences merge, driven by (philosophically crude) idea of cultural and linguistic relativism of knowledge. Although the purist argumentation includes clearly nationalistic aims, I will show that it is rather a multilayered way of coping with multilinguistic situation of Central Europe and of peripheral situation of sciences of "small nations."

Session: Living The Babel: Dealing With Scientific Multilingualism In The European Periphery

THE QUEST FOR A UNIVERSAL LANGUAGE FROM A PERIPHERAL PERSPECTIVE: JOHANN SIGISMUND POPOWITSCH/ JANEZ ŽIGA POPOVIČ AND HIS APPROACH TO BOTANY AND GEOGRAPHY

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Abstract

In 1750, the linguist and botanist Johann Sigismund Popowitsch / Janez Žiga Popovič proposed a very special research project to the Cosmographic Society in Nuremberg. Popowitsch, devoted to botanical studies and an expert of both Germanic and Slavic linguistics, asked the Society for financial support in order to undertake an exploring expedition to the south Slavic regions all the way to Constantinople. The aim of this expedition was to examine and collect the botanical peculiarities of the region and to conduct a comparative linguistic research of its languages and dialects. Influenced by Leibniz, Popowitsch emphasized the significance of etymological analyses and particularly stressed the importance of Slavic languages and above all of the Slovene language. Based on the interest in the regional languages and their botanical and geographical vocabularies, his research project formulated simultaneously a critique of the Linnean Latin nomenclature of plants. The interest in the regional linguistic specificities also informed Popowitsch's objective of establishing an alternative universal scientific language for botany and geography: Based on the pronunciation of the Slovene language, he developed an alphabet that would act as a general medium for writing and pronouncing all the different regional botanical and geographical terms and would thus enable the transregional communication and comparison of botanical and geographical knowledge.

Popowitsch's field research in the Balkans was never realized. Instead, he was appointed to the first professorship of German linguistics at the University of Vienna in 1753. At the behest of empress Maria Theresa, he wrote a grammar of the German language emphasizing its specificities as spoken in the Austrian countries.

The paper will deal with Popowitsch's peripheral perspective on the contemporary botanic sciences and linguistics in the context of the Habsburg Monarchy and his utopian language project that combined the aim for a universal scientific language with the interest in the variety and etymology of regional linguistic occurrences and in the situated botanical and geographical knowledge.