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Mobilities: The Role of the Social Sciences and Humanities under the United Nations Sustainable Goals for 2020–2030

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The United Nations Sustainable Development Goals for 2020–2030 include areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice. The topic of migrations comprises broad concepts of socio-cultural, religious, political, economic, environmental and technological movement and change. The consensus seems to be that the future lies in cooperation across disciplines. The question of this paper is: how far can social scientists go or want to go down this road?

The United Nations Sustainable Development Goals (SDGs) for 2020–2030 are a universal call to action, and cover, among other challenges, climate change, economic inequality, innovation, sustainable development. How can the Social Sciences and Humanities contribute to this? Our proposal is that the answer depends, foremost, on multisectorial partnerships. In particular, our reflection will apply to the topic of Mobilities. The skills, experience and research interests of the Social Sciences and Humanities can play a decisive role in this analysis. A multidimensional appreciation of global change resulting from mobility processes is required. The connection of migration issues with changing value-systems and cultural behaviours and its environmental impact is but one dimension. Since past and present oceanic and trans-oceanic migrations are a focal point for the study of globalization, this becomes a crucial point. Some of these topics have been dealt with by historians, demographers, anthropologists, economists, even biologists or epidemiologists – separately. Given the demonstrated usefulness of these concurrent yet often separate approaches, bringing these disciplines together will provide a new paradigm for approaching the topic of Mobilities. Until several decades ago, the academic debate on Mobilities focused on the movement of people, and that of goods and services.

It has, in recent years, shifted to look at Mobilities as a process that is firmly embedded in society and culture (Pooley 2017), and reflecting a new mobility paradigm that privileges integrated approaches (Cresswell 2012, 645–653). The causes and the patterns of this phenomenon, the reactions to the arrival of new individuals and ways of leaving are just some of the issues that need to be studied.

This article will introduce some concrete examples of research focused on or resulting from *Mobilities*. The first example derives from the CITCEM (Centro de Investigação Transdisciplinar 'Cultura, Espaço e Memória', University of Porto) Research Line 'Global Exchanges', which specifically calls for interdisciplinary approaches by focusing on the concept of trans-oceanic exchanges. It considers the migration of political, religious and economic models such as those integrated in colonial systems. This encompasses the transfer and mobility of populations, commodities and trading networks, material culture, science, technology, knowledge, and intellectual and religious ideas. One of the topics the group deals with is related to the circulation of knowledge in colonial contexts. This should contribute to the understanding of mechanisms and processes of production and circulation of knowledge in the Early Modern Age. The Early Modern colonial empires connected a wide variety of peoples and cultural complexes. The focus is on the relation between local processes of knowledge production and their connection with wider contexts. Knowledge production in this perspective no longer relates only to 'scientific knowledge', but also involves wide-ranging practical knowledge and its global circulation as a highly complex system.

During the last decades, in Early Modern colonial studies there has been an increase in studies analysing the role of local populations in the processes of empire building (Raj 2013, 337–347). Another discussion that has become increasingly relevant concerns the importance of non-official circuits, mechanisms and networks (Polónia 2013, 133–158; Polónia 2017, 113–139; Antunes and Polónia 2016). Crucial in this context were the activities of various intermediaries without whom the colonists could not have successfully interacted with the local communities, nor gained access to their set of practices and knowledge. These individuals constituted an extremely diverse group, and they created varying dimensions of sociability, sharing knowledge and other cultural features. Whether surgeons, physicians, herbalists or missionaries, village healers or midwives, such agents composed a far more complex picture than the official channels of colonial power agents would suggest (Polónia and Capelão 2017, 58–89; Raj 2009; Bracht 2016, 94–121; Bracht 2017). The notion that the mobility of knowledge, in historical terms, is closely linked to migration processes, has in itself several meanings. We concentrate here on the transmission of knowledge, techniques and concepts between cultural frontier lands.

Most likely, many of the formative elements of any given culture, from the material goods it possesses to intricate networks of meanings, rituals or beliefs, constitute elements that were eventually incorporated through contact with other cultures (Burke 2009). Recently, science historians have attributed increasing importance to the notion that such spaces sheltered intense dynamics of construction, extension

and reconfiguration of a shared knowledge (Hsia 2009; Raj 2009, 105–150; Furtado 2011, 21–81; Bastos 2010, 185–212; Pardo-Tomás 2014, 749–776). The role of the local communities in the construction of knowledge had always been considered secondary (Basalla 1967, 611–622). However, new approaches have broadened this scope to the point where the production of scientific knowledge is now perceived as the result of a series of processes of shared cultural construction.

From this perspective, historians, sociologists and philosophers of science have sought to understand the production of knowledge throughout the Early Modern Era as the sum of several processes, which involved the colonial spaces in a multidimensional way. The production of knowledge in the colonial environment was much more than simply the result of collaboration. It also emerged from conflict, from cross-interests, and through sensible negotiation processes (White 2001). The approach suggested here implies an ongoing discussion between the history of science and other correlated disciplines. It reassesses the historical dimensions of science in its many aspects. These highways of research have a recognizable potential to be applied to today's power games at a worldwide level, seeing communities all over the world as holders of knowledge.

Another question concerns the ecological impact of mobility (Simberloff and Rejmanek 2011; Vaz 2018). The Early Modern Age is increasingly seen as a time of growing interconnectivity among continents and oceans. This opened the door for the creation of a world economy as much as for environmental impacts resulting from global transfers. During this period, Europeans invaded old and new worlds aiming for a quick, effective and profitable use of their resources. According to the 'ecological imperialism' perspective, Europeans tried to replicate their way of living in the new territories. A colonial economy, ruled by European markets, introduced new patterns of territory management, property regimes and soil exploitation. Ecological and environmental equilibria were unbalanced, not in a long-term process but in a short and invasive onslaught of transformation and depletion (Crosby 1988). In the ecological imperialism perspective, the local agents are usually excluded from the dynamics of colonial processes. This ignores the important processes of adaptation and evolution that result from the entanglement of different natures and cultures. Hence, this perspective needs to be revised. Examples are the 'post-colonial studies' developed since the 1980s. More recent perspectives centre on a connected history of the colonial empires (Subrahmanyam 2007, 1359–1385). Studying the world as highly intertwined or from a global history perspective has contributed to a revision of Eurocentric interpretations of colonial phenomena (Boyajian 2008; Darwin 2008; Polónia 2012, 349–372). The application of cooperation theories by environmental historians clearly also has something to offer to a re-analysis of the environmental effects of European colonialism. Spatio-temporal models of cooperation will allow us to assess how far the unequal roles played by the various parties affected cooperation, adaptation and reciprocity. In this analytical approach, self-organization theories may also provide an adequate complementary perspective of analysis (Vasconcelos *et al.* 2013, 797–801). Evolutionary ecology contributes new insights to the revision of ecological imperialism, stressing that through the

millennia there were no stable environments: evolution and transformation are permanent trends of living systems (Santos *et al*. 2006, 1284).

Interdependencies between 'worlds' necessarily went further. Adaptation prevailed, both of the colonized to the presence and methods of the colonizers, and vice versa. Survival and the success of economic enterprises in such different worlds inevitably implied adaptation and acculturation, for Europeans too: they were the ones involved in direct processes of mobility. In other words, the lives of the first European settlers overseas would most probably accelerate reciprocal acculturation processes, different from those described by traditional imperial historiography. More often than not, colonizers depended on autochthones to provide them with the requested resources, transferring technologies that would unbalance the current ecological equilibrium. Those are, however, domains in which we often lack measurable testimonies, precisely because they occurred beyond the frame (or at least the focus) of the conventional 'empires'. Only a systematic analysis of these dynamics will provide an appraisal of the long-term ecological impact of such cooperation between colonizers and colonized. Transfer flows were never unidirectional. There is a range of tropical and Asian products that should be of particular interest because of their massive and structural impact on the food regimes of Europe and Africa. Corn (maize) and manioc are just the most prominent examples. This mobility of species generated much more than destruction, pollution, depletion and imbalances. New balances emerged, transforming land use, property regimes, protein availability and population dynamics in Europe as well. Two main ideas should be stressed: reciprocity, syncretism and evolvability are paramount to understanding ecological processes (no species survives without assimilation by the receiving ecosystem and cultures) and, besides destruction patterns and stressful mechanisms projected onto the ecosystems through colonial action, one should also look at the mechanisms of adaptation, and analyse the degrees of resilience of ecosystems and human communities to different kinds of stress. They showed a surprising adaptability and created alternative patterns of survival. When worlds collide, they also intermingle, creating new worlds (García Zaldúa 2017).

Evaluating long-term changes and environmental processes for the pre-statistical era seems frequently impossible. That is also why local inquiries and micro-analyses facilitate evaluations in a context in which macro-level approaches cannot be pursued, at least from a historical point of view (Polónia 2015, 43–66). One may think globally, but as for an analysis, in Early Modern History, local is the available scale of scrutiny. How are we to measure when we do not possess serial, systematic and coherent data? This is the reality both for the European pre-statistical era and for the kind of registers provided by other cultures. The answer requires interdisciplinary methods and teams. Since the 1990s, studies in environmental history have attempted to elaborate an all-encompassing perspective. Our approach tries to combine historical information with anthropological knowledge of the communities of contact and mathematical modelling. This new paradigm intends to combine historical sources of information, dating from the pre-statistical era, with predictive models of ecology, cooperation and evolution.

We have seen that monodisciplinary approaches have been the rule in environmental history studies. If we promote the interplay between various disciplines, their methods and their knowledge, we might come up with a new paradigm of how to approach this topic. One may argue that this quest is not entirely new. Indeed, it has often been acknowledged recently, and has been implemented in other research areas. In environmental history, though, this goal remains largely unachieved, although recent publications acknowledge the principle (Emmett and Zelko 2014). Today more than ever, academics are encouraged to work across disciplines.

The combination of mathematical modelling with pre-statistical data gathered from historical sources to define possible evolving scenarios that are impossible to obtain from historical analysis alone is certainly innovative, in particular in the field discussed above. This is the aim of the 'Ecodigging' project, a research project, still waiting for heavy funding support, based on interdisciplinary foundations. On the one hand, historians have to identify sources that can provide a consistent base for modelling exercises. On the other hand, models will guide historians as to what kind of data they must seek. Given the limited availability, and the non-linearity of the models involved, it is crucial to get point-like information in the vicinity of what experts designate as 'tipping points' – decisive moments in space and time (Scheffer *et al.* 2012, 334–348). This implies an interplay between researchers from different fields, which will foster a new generation of researchers. The study of history will gain from the attempt to quantify the scale of environmental impacts. From a historiographic point of view this constitutes an opportunity; from a modelling approach, it is a fascinating challenge. The possible input of this new approach to environmental history for the period under scrutiny is twofold: it may contribute to the comprehension of human dynamics responsible for environmental changes and it may help us understand the limits of ecosystem survival and the ability to adapt to changing environmental frameworks – one of the main aims of the UN Global Goals.

Environmental history should not present human-induced environmental change as 'an unrelieved tragedy of remorseless ecological degradation and accelerating damage' (Richards 2003), as it is currently seen by most of those who refer to the Anthropocene as the era of the humans. In this sense, to underestimate the resilience of ecosystems and to overestimate human-induced impacts as opposed to natural processes, is to risk producing an analysis that may prove too simple in the long run. Climate, geomorphology, and culture also forcefully intervene with evolutionary ecosystems. Concurrently, ecosystems affected by human action during the colonial period are not necessarily sterile, unbalanced, or degraded. They changed then, as they had changed before, keep changing now and will continue changing – an attribute of all living systems. Eventually, an environmental history that satisfies itself with deploring the many negative impacts of European colonization upon the non-European world neglects the role played by ecological and cultural dynamics of adaptation during the process, as that of the role played by non-European populations and other cultures – and this is a perspective that needs to be overcome.

Summing up, two basic ideas have come to the fore in the discussion about the worldwide impact of multiple mobilities caused by the colonial dynamics of the First Global Age. We have seen an added complexity to the understanding of the framework until now simplistically seen as the 'Columbian Exchange', and we have also pinpointed the need for an active interdisciplinary dialogue. The recent publication in the *Royal Society Open Science* of an article by a multidisciplinary team of Historians, Physicists and Computational Scientists on 'Structural and temporal patterns of the first global trading market' (Ribeiro *et al.* 2018, 1–8), a result of a multidisciplinary project funded by ESF, gives us reason to hope we will not have to wait until a new generation of researchers comes up to see the results of this struggle. Against the dominant trend that reserves for history and the social sciences a peripheral role, the UN Global Goals, as well as some new developments in evolutionary ecology (Levin 1999) offer some scope to the humanities and the social sciences to play a decisive role in the analysis of crucial issues, not only for developing countries and regions, but for humankind in general.

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