Introduction: Subtle flows

De-centred knowledge exchanges between Latin America and Europe

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The essays in this volume represent a selection of papers originally presented at the symposium "De-centred science, for real? Transits of mining chemistry, medicine and natural history in Europe and Latin America." It was organised by the editors, together with Professor Georges Métailié, Paris, as part of the 25th International Congress of History of Science and Technology, held in Rio de Janeiro in 2017.[1]

Our key questions for both the symposium and the present collection were: do major centres of colonial and economic power really function as obligatory points of passage for scientific knowledge and practices? To what degree have, and can, such centres be sidestepped, and can their influence and the centrality of their position be subverted or neutralised in the long run? Are the models of decentred global science which have emerged in recent years really adequate for the study of exchange and interaction between (former) colonies of European powers and regions of Europe which were outside the colonial orbit? How should we revise our theoretical understanding of global exchanges in science, taking into account the experiences and knowledge of Latin American and Swedish historical scholarship? One further question was somewhat more personal: how comes that Latin American and Swedish historians of science, even when they write about de-centred exchanges and criticise the notion of 'centres' and 'peripheries,' constantly look towards, and seek to have their work

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validated by actors and institutions that are mostly located in England or the United States?

These questions arose from a common puzzlement that united Latin American and Swedish scholars alike. It is nowadays generally acknowledged that early modern, as well as contemporary science, involved global exchanges of knowledge and objects. Taking into account the relevance of the movement of people and things for the development of knowledge, or for any change in bodies of knowledge, is becoming obligatory for scholars who wish to remain in dialogue with a larger community of peers. This new type of global history writing claims to study episodes and transits which can be geographically decentred. It is articulated in opposition to an older type of historiography, which drew by default from geopolitical maps provided by the dominant powers of the colonial era, was written mainly by white, European males, and more or less reinforced and strengthened the relationships of power and subjugation deemed natural by such men. The editors of the present volume agree with most of the arguments lined up in support of the new global history of science. It is important to investigate dialogues between apparently unconnected places. One should strive to present unconventional (hi)stories which show we can break out of narrow and conventional geopolitical boundaries. We agree that we must avoid the pitfalls of essentialising cultures and groups, reductionism, and dichotomising paradigms. And we also hold that older scholarship often tended to emphasise colonial, as well as other asymmetrical relationships of power, reinforcing them until making them acquire the appearance of being self-evident, if not expressions of the natural order of how things are, or should be.[2]

As a result of its worldview, the older scholarship often made use of top-down models to make sense of global transfers of knowledge, the paradigmatic case being how the European so-called Scientific Revolution and the British Industrial Revolution transformed the rest of the world. In these models, relationships were often framed in the terms of 'centres' and 'peripheries.' These terms were used to model global exchanges, understood to be characterised by an unequal relationship extending from economic and political cores to dependent, subordinate areas. The two terms eventually spawned a whole array of auxiliary terminology. Hence, there were, supposedly, also centres in the periphery, as well as near and distant peripheries, each of which related to the centres in different ways.[3]

We decided to revisit this outdated terminology, while keeping the insights of, and problems with the older scholarship in mind. Because although this terminology may look cumbersome, it might express something vital about the workings and transit of science. Indeed, we believe

that the field of global history of science, with its preference for searching out 'patterns of mutual interdependence' and its preferred terminology (porosity of borders, sociology of encounters, hybrid practices, etc.) may sidestep, rather than solve the old problem of explaining how *centres of accumulation*, or perhaps rather *centres of calculation*, project influence over, and command the attention of less influential places of knowledge production.[4]

Can we really talk about a decentred world? And if we want to talk about it, can we find it? The interactions of science between Latin America (in particular, Brazil) and northern Europe (in particular, Sweden) provide an important case in point. Some would argue that it does not make much sense to study direct paths of exchange between these regions. This is because most paths of knowledge were mediated by, and strongly dependent on the orientation of these areas towards third parties. This point was made with precision in 1862 by Ernst Åberg, a Swedish physician in Buenos Aires, who is the subject of the article by Jaime Bortz in this collection:

> I cannot deny that I regard this as a great shame for Sweden, because the greatest difficulty seems to be to get anything from Sweden to England. As from the last-mentioned country we get everything we want with the greatest ease, even the newspapers, free of postal charge, once a month. Anything new about medicine from Sweden would, hence, be very welcome for a hungry belly, that is not often used to such delicious fare; but how should it be accomplished [?].[5]

Indeed, we fully agree that it is not possible to analyse, or understand, entities such as, e.g. Swedish, Brazilian or Argentinian science, if one does not also consider how the research communities of these countries related to such places as may indeed be designated *centres*, and which were located in, for instance, Britain, France and (for the twentieth century) the United States. But there are also more complex aspects to this.

Unusual contacts may offer advantages compared to more obvious ones, and there were many benefits (such as unique or rare research materials, educations, investigative practices, collections, etc.) which small-country European and Latin American practitioners of science and medicine could obtain by choosing to interact with each other, rather than with central nodes in England or the United States. To describe these relationships in Mark Granovetter's terms, we investigate what "weak ties" offered that "strong ties" could not.[6] We believe that such an approach is necessary to achieve our long-standing aims of elucidating how and why the demarcation lines between science, as a more authoritative form of knowledge production than 'ordinary knowledge,' were drawn, including the material,

global and colonial aspects of this process. The papers in this volume illustrate various of these aspects.

It is no coincidence that the volume begins and ends with the study of a substance. To Europeans, Latin America has to a large extent functioned as a source of raw materials whether for consumption, industrial transformation and later resale, or for display in collections. Hence the all-important economic dimension of the production of commodities has a definite place also in narratives about knowledge exchange.

The papers

Liliana Schifter's paper, the first in the collection, is an excellent illustration of how attempts at scientific understanding of a substance are intertwined with their cultural function as commodities or for other purposes. Her paper is to one part a description of how cocoa was appropriated by Western medicine, and how the meaning of this substance was renegotiated by a succession of scholars and men of science. But it is more than that. Chocolate is an extraordinary thing also to Western medicine, containing an enormous number of physiologically active components. Hence, the 'food of the gods,' as it was called by the Mexican natives, eluded comprehensive description. By painstakingly looking at how various actors tried to understand this complex object, Schifter observes that the knowledge associated with it became a hybrid, or a synthesis of native American and native European knowledge traditions. The knowledge on chocolate did not begin with Europeans, it was not a result of 'colonial' politics, it was assimilated and re-signified by Europeans according to their own perspectives, but without losing completely out of sight the traditional knowledge. Schifter, hence, addresses an important topic in the study of global knowledge exchanges: *Western knowledge is an indigenous knowledge, through which groups of actors tried to make sense of the world.* It is limited, bound by constraints, and can only make sense of parts of what it encounters, not of wholes. Consequently, historians studying global exchanges of knowledge are, in a sense, engaged in the recovery of the wider picture of which Western knowledge was a part. Studying cultural encounters, we investigate how hybrids were created through circulatory practices, how nomenclature, representations, classifications and cosmic visions were translated. However, a *wider picture*, although arguably a better representation of historical reality than a limited one, must not be confused with the *whole picture*. Academic, professional history is, after all, an empirical science developed in the West. Historians must work with the sources and modes of comprehension to which they have access, and no more than physicians and natural scientists can they claim to create representations of the whole picture.

The question of what happens when two cultures meet is central to the second paper of the collection, Raphael Uchôa's study of the scientific expedition of European scholars Karl von Martius and Johann von Spix to Brazil in 1817. Martius admitted that his European background and knowledge did little to prepare him for the different universe that South America presented. The expedition, thus, was seminal for Martius' thought, and after his return to Europe, he mobilised concepts such as monogenesis, human races, and civilisation to comprehend his encounter with Brazil. Eventually Martius created a classification of 'Americans' and the 'American races' as part of his historiographical programme, a programme that has continued to shape Brazilians' understanding of themselves to this day. However, Uchôa's investigation is much more than the story of how European scholarship shaped Brazil. The place from which Martius came and to which he returned was the Kingdom of Bavaria. In existence in the period from 1806 to 1918, Bavaria may, by comparison to England, France and even Prussia, be considered part of the European scholarly periphery. Received wisdom would have it that such a place would exert little global influence during the era of high colonialism. Uchôa, however, subtly investigates how Martius' work took place under the aegis of little investigated scholarly connections and ties between the Bavarian and Brazilian courts. Hence, he provides an excellent example of how German scientific and political networks extended into Latin America and vice versa, connecting central Europe to places like Rio de Janeiro, as well as plantations and towns in, e.g., the interior of Brazil. Uchôa's paper, therefore, does something that should be mandatory in studies of global knowledge exchange. It discusses two localities, disregards the issue of whether they should be considered important places or not, and gets to the work of investigating how they were connected.

The two following studies in this collection, by Jaime Bortz and Daniel Normark, exhibit several similarities. Both study the South American careers and activities of physicians connected to Karolinska Institutet in Stockholm, and both discuss global transfers of medical knowledge. Bortz's study deals with Ernst Åberg, a Swedish physician who emigrated to Buenos Aires in the mid-nineteenth century. Åberg began his Argentinian career as a regular physician, highly involved in public health issues. However, after a sojourn of several years in Stockholm, he eventually returned to Buenos Aires. He refashioned himself into an advocate of medical gymnastics and became the director of a Zander medico-mechanical institute, equipped with machinery that he imported from Sweden. Åberg's story show how actors can occupy two worlds, and draw on both, reaping benefits from a position as go-betweens. It also presents an example of a successful long-distance transfer of skills and knowledge.

Åberg introduced Swedish medical technology and methods to Argentina, but he also brought Argentina to Sweden by publishing on his Argentinian experience and practice in Swedish. Clearly, medical techniques can travel between Sweden and Argentina, which stand out as two decentred sites of knowledge within a bi-directional exchange.

Normark's paper discusses the famous surgeon Clarence Crafoord, and how he headed a team of Swedish surgeons travelling to South America in the mid-twentieth century. Hence, he maps out an attempt to transfer surgical skill from Stockholm to Argentina, Brazil, Chile and Uruguay. Yet, while Bortz's paper presents an example of a successful case, Normark's presents its opposite. As he shows, tremendous effort was required to teach/learn skill, and the final results were meagre. 'Skill' is different from many other types of knowledge insofar as it must meet several difficult requirements to be transferred: a virtuoso, actual performance, a master-disciple relationship and physical contact. Teaching/learning skill does not seem to be possible without physical presence, thus it demands travelling by necessity. By mapping out Crafoord's tour, the paper uncovers historical ties between Sweden and South America which are all but forgotten today, but also a paradox. Heart surgery was already an established speciality in Argentina at the time. For this reason, there was really small need to transfer skills and procedures from faraway Sweden. Underneath the story of Crafoord's journey, hence, lies another story about trade, politics and competition between different medical groups and specialities. Regardless of whether we should see the tours as successes or not, Normark's study clearly shows that global scientific and medical exchanges do not need to be mediated or controlled by major powers, but can follow other, subtler paths.

In all, the studies by Uchôa, Bortz and Normark present us with cases that cast light on both sides of processes of knowledge and skill exchange. These kinds of studies should, in our opinion, be more widely emulated. Only when we have a wide selection of representative case studies such as these, we can begin to discuss which places and connections we should regard as central or peripheral. Ridding ourselves of a priori assumptions, we may be in for great surprises. As illustrated by the next paper in the collection, defining 'centres' and 'peripheries' can be elusive. A periphery can become a centre, and even when temporary, it leaves historic traces. And every centre, even the most impressive ones, eventually becomes a peripheral place with the passing of time. In his paper, Carlos Haag investigates a British expedition to the Amazon in the twentieth century, its organisation, purpose and local repercussions. Britain is far from peripheral to the history of Brazil, but as Haag shows, towards the middle of the 1900s the power relationships shifted. Britain, which had previously held

a presence as a major power in South America, now struggled to compete with the United States, even in areas in which it had previously held pre-eminence. This, furthermore, connected to wider political and cultural change. The British expedition to the Amazon, as described by Haag, failed to provide a model for post-colonial interactions with Brazil, and little but traces remained of the attempt. Hence, Haag unveils the process through which scientific contacts once considered important become forgotten or neglected as the interests of a scientific environment shift, and researchers orient themselves towards new or other centres of knowledge, forgetting that the world was not always as it is today.

Transfers of knowledge may also be studied in comparative perspective. This is done by Silvia Waisse and Motzi Eklöf in their article on the encounter of homeopathy with, respectively, Brazil and Sweden. Histories of homeopathy have often emphasised the role of individual introducers of homeopathy into specific countries. By choosing instead an institutional perspective, the study presents a viable explanation as to why homeopathy took so very different paths of development in the two countries. In Sweden, homeopathy was never institutionalised, but merely tolerated, and is still a more or less marginalised practice, regarded with scepticism by many Swedes. In Brazil, by comparison, homeopathy gained an early and strong support among progressive parts of the ruling classes, and received, in global comparison, one of the highest degrees of institutionalisation. Today, it is reimbursed by insurance companies, and respected and used among large parts of the population. In a sense, the paper takes an institutional perspective to the question of how to explain cultural difference. Indeed, it points to a significant difference between the 'old' world and the 'new': in Brazil, as in the United States, the medical market was open and not yet dominated by any single view. In the absence of an official and state-sanctioned medical body opposing homeopathy, there was much more space for it to flourish. Furthermore, Waisse and Eklöf's paper, being a jointly written study by a Latin American and a Swedish scholar, provides an interesting model for how the development of local knowledge traditions may be studied. It shows how the path of development of one and the same thing may vary according to local circumstances, and the receptiveness of the local culture and local institutions. Cultural and institutional differences, in turn, influence policy and may, as in the case of homeopathy, shape basic assumptions about whether a medical speciality/tradition is scientific or not. Hence the paper address what happens when different medical cultures meet, and shows that divergences can be expected to appear even when both medical cultures are 'Western.'

Cristiana Couto and Ana Alfonso-Goldfarb's paper, finally, deals with the emergence of the Brazilian coffee industry and how science was involved

in this process. Coffee was the engine behind the early development of Brazil, but the industry faced two problems. The first was manpower—slaves in Brazil had just gained their freedom. In search of cheap labour, the government moved to bring immigrants from Europe: immigrants who tended to fall ill to countless hygiene-related and local diseases for which they had no immunity. This provided a large part of the explanation behind the establishment of public health in Brazil. Scientific medicine was equated to the success of microbiology, a view that also sparked off intensive research in the epidemics which killed the workforce. Hence, coffee, in a very important sense, drove the development of public health and medical science. The managing of the coffee industry also led to interesting modalities of exchange of knowledge, particularly in regard to the pests that devastated plantations, thus with a relevant role in the incipient entomology. With this paper, the collection goes full circle, returning to the issue of substances. However, while Schifter's paper studied chocolate as a focus for efforts of scientific understanding, Couto and Alfonso-Goldfarb have recourse to coffee to describe how medical science is intertwined with wider processes of demographic and economic change.

Concluding remarks

The essays in the present collection cannot provide answers to all of the questions we presented in the beginning of this introduction. But they do further our understanding of this difficult topic. Clearly, major centres of colonial and economic power can be sidestepped and need not function as obligatory points of passage for scientific knowledge and practices. But given that scientific clout and prominence closely trace political and economic power, it is much more difficult to establish that peripheral actors can exert substantial and long-term influence on scientific and medical centres, or for that matter, subvert or neutralise their influence. Undoubtedly, some places are more important than others, but simultaneously, such places would not function were it not for the spaces in between, exchange of symbols, things and people which enable knowledge to be renewed, and the 'central' institutions and actors to transform themselves to stay in the game of producing knowledge perceived to be relevant outside their immediate local context. Hence, Kapil Raj had a point when he asserted the relevance of the process of circulation itself as a site for production of scientific knowledge.[7]

However, in our view, it is not the terminology of 'centres' and 'peripheries' itself that is at the root of the problem, but received notions of 'centres' and 'peripheries' which are insensitive to historical changes over time, and are badly defined, i.e. are unclear about in which dimensions

(spatial, economic, with regards to reputation etc.) a place is taken to be central or peripheral. Equally important is also that our notions of centres are marred as they, to a much greater degree than is generally acknowledged, are artefacts of present-day historiography. This brings us, finally, back to the discussions which sparkled off this collection of essays. How comes that Brazilian and Swedish historians constantly look to, and travel to a small subset of mostly Anglo-American universities and other environments considered central and influential in our profession? Why do we continue to validate the centrality of these places in our own scholarly practice? As historians of science, we all travel to our own centres (which are great places with lots of nice people, by the way!) to get our work validated, and then, after having learned that the world is decentred and place does not matter, we return to … our places of residence.

This collection is, in a sense, a call for action, directed at Latin American and Northern European scholars. The cooperation that engendered these papers made us aware that we have only scratched the surface of available sources. There have been networks and collaborations between Swedish and Latin American individuals and institutions throughout the nineteenth and twentieth centuries which need to be investigated and interpreted. A good place to start is in the extensive library holdings at Karolinska Institutet of Latin American scientific works, reports and journals, as well as material connected to scholarly exchanges and scientific expeditions. Another is in Swedish museums which hold large amounts of Latin American ethnographica. Interestingly, these historically strong ties became all but forgotten at the expense of those with the United States, for instance. This observation does not only indicate that our perceptions are formed by historical relationships of power, but that our gaze is also directed and governed by the present world order.

Indeed, the presently so-celebrated field of global history of knowledge is shot through with the managing of exclusivity, control and restriction of knowledge, and needs to be critically scrutinised. The restriction of access to scientific journals behind paywalls which make them available only to scholars connected to well-funded universities (co-incidentally, mostly located in the global North) is an excellent example of this. What purposes does a dialogue about global, de-centred scientific interactions serve, when it takes place behind a paywall that excludes large numbers of scholars with experience and knowledge of the topics discussed? When choosing to publish our results in *Lychnos*, as the first English-language collection of themed papers in a journal that mostly publishes Swedish-language papers, we were fully aware that we may not reach as large a readership as we would if we had published in a major anglophone journal. However, *Lychnos* kindly welcomed our endeavours and is committed to

free digital access. Hence, we seek to make our own little contribution to a de-centred knowledge production that is non-patronising, open and inclusive.

Notes

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2. See e.g. Sujit Sivasundaram, "Sciences and the global: on methods, questions, and theory" in *Isis* 101:1 (2010), 146–158; Neil Safier, "Global knowledge on the move: itineraries, Amerindian narratives, and deep histories of science" in *Isis* 101:1 (2010), 133–145; Kapil Raj, "Beyond postcolonialism … and postpositivism: circulation and the global history of science" in *Isis* 104:2 (2013), 337–347; Kapil Raj, "Networks of knowledge, or spaces of circulation? The birth of British cartography in colonial south Asia in the late eighteenth century" in *Global Intellectual History* 2:1 (2017), 49–66.

3. As an example of this style of reasoning can be cited Svante Lindqvist (ed.), *Center on the periphery: historical aspects of 20th-century Swedish physics* (Canton MA, 1993). For an overview of the historiography on this subject, see Ana M. Alfonso-Goldfarb, Hasok Chang, Márcia H.M. Ferraz, Jennifer Rampling and Silvia Waisse, "Chemical knowledge in transit" in *Ambix* 62:4 (2015), 305–311.

4. James A. Secord, "Knowledge in transit" in *Isis* 95:4 (2004), 669. On the term 'centres of accumulation,' Henri Lefebvre, *The production of space* (Oxford, 1991); on 'centres of calculation,' Bruno Latour, *Reassembling the social: an introduction to actor-network-theory* (Oxford, 2005).

5. Letter from Ernst Åberg to C.G. Santesson, signed Buenos Aires 27 May 1862, arrived 11 July 1862. Hagströmerbiblioteket, Karolinska Institutet, Shelf Mark 715:32. Translation by Hjalmar Fors.

6. Mark S. Granovetter, "The strength of weak ties" in *The American Journal of Sociology* 78:6 (1973), 1360–1380; and "The Strength of weak ties: a network theory revisited" in *Sociological Theory* 1 (1983), 201–233.

7. Kapil Raj, *Relocating modern science: circulation and the construction of knowledge in South Asia and Europe, 1650–1900* (Basingstoke, 2007), 13–14, 18–21.