

Chapter 1

Mobilities of Knowledge: An Introduction

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Wenn man sich zu den Gegenständen selbst begibt, hält man nichts anderes eher für wahr, als bis man es selbst angeschaut hat, so mag der Weg vielleicht langsamer sein, aber er ist auch sicherer und reizender und der Stoff des Nachdenkens ebenso unerschöpflich als die Menge der Gegenstände in der Natur.

If one betakes to the things themselves, one does not accept anything else as truth unless one has looked at it oneself, so the journey may be slower, but it is also more secure and alluring and the intellectual nourishment equally inexhaustible as the amount of things in nature.

(Wilhelm von Humboldt to Friedrich Heinrich Jacobi, 17 November 1788 quoted in Geier, 2009, pp. 93–94; translation by authors).

This book examines how the geographical mobility of people, practices, institutions, ideas, technologies, and things has impacted epistemic systems of knowledge. The pivotal role of such mobilities in the acquisition, exchange, and generation of knowledge is vividly exemplified by the well-known brothers Wilhelm and Alexander von Humboldt, both of whom shaped cultural and intellectual life in eighteenth and nineteenth century Europe. Educated at home by private tutors in Berlin and nearby Tegel until their late teenage years, the Humboldt brothers studied at Frankfurt-on-Oder and Göttingen, where Wilhelm enrolled for law and Alexander for public finance, before the latter moved to Freiberg to continue his education in mineralogy and geology. During their time at university, the Humboldt brothers undertook separate European tours on which they met leading intellectuals, including the naturalist Georg Forster, veteran of James Cook's Pacific explorations. In 1789, Alexander toured the basalt landscapes of the Rhine, while Wilhelm

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witnessed the early days of the French Revolution in Paris, recording his impressions in a famous diary (Geier, 2009).

The travel experiences of the two brothers in this formative era had a discernible impact on their characters, interests, and subsequent mobilities. Alexander became one of the most accomplished and esteemed scientific travelers of the age, exploring remote landscapes and environments, especially in Latin America, and transforming the emerging disciplines of geography and the natural sciences (Rupke, 2005). His brother meanwhile, residing in the cities of Jena, Paris, Rome, and Berlin for most of his professional life, developed an essentially sedentary mode of humanistic research in philosophy and linguistics that was interspersed with stints in the Prussian diplomatic and educational civil service during which he established the new University of Berlin more or less single-handedly in 1809–1810 (Anderson, 2004). Together the Humboldt brothers epitomize the important role of geographical mobility for education and learning, and how knowledge production in different academic fields, or, more generally, the production of different types of knowledge, implies varying degrees of mobile and sedentary professional lives.

The essays in this volume follow in the footsteps of the Humboldt brothers by examining the role of geographical mobilities in the production and circulation of knowledge in different historical and geographical contexts. We define mobility as an entity's change of position in a specific system (Bähr, 2010), whether this relates to people, material things, or knowledge in geographical (King, 2012), social (Bourdieu, 1986), and/or epistemological space (Barnett & Phipps, 2005). The book *Mobilities of Knowledge* directs attention to geographical mobilities *for* knowledge in the process of its production and *of* knowledge as part of its dissemination and transfer, while stressing that geographical and epistemological movement across different places and fields of knowledge are closely intertwined (Barnett & Phipps, 2005). Three key research questions inform the individual analyses in this book: What role has geographical mobility played for the production and dissemination of knowledge in different historical, geographical, and sectoral contexts? How have different types of knowledge, as well as related practices and products, been transferred between individuals, institutions, and places? And to what extent have knowledge and its mediators, as well as places of origin and destinations, been transformed through geographical mobility and shaped by varying social, cultural, economic, and political contexts?

The contributions to this book build on research about the creation, mobility, reception, and geographical distribution of different types of knowledge in hitherto largely separate fields of inquiry, such as organization theory, the history and geography of science, the history of geography, migration studies, and the geographies of education. They specifically add detailed case studies and conceptual considerations to existing research in the geographies of science (e.g., Driver, 2001; Gregory, 2000; Heffernan, 1994; Keighren, Withers, & Bell, 2015; Livingstone, 2003; McEwan, 2000; Meusburger, Livingstone, & Jöns, 2010; Powell, 2007; Simões, Carneiro, & Diogo, 2003) and the migration of skilled people (e.g., Findlay & Gould, 1989; Salt, 1997; Smith & Favell, 2006; Van Riemsdijk & Wang, 2016). Scholars working in these areas have traced, analyzed, and critiqued the highly uneven mobile spaces of knowledge production and dissemination at different

geographical scales, focusing on professionals in high-tech industries (e.g., Harvey, 2009; Saxenian, 2006; Van Riemsdijk, 2014) and advanced producer services (e.g., Beaverstock, 2005; Beaverstock & Hall, 2012; Fechter & Walsh, 2012; Walsh, 2012), on researchers and academics (e.g., Ackers, 2005; Heffernan & Jöns, 2013; Jöns, 2003; 2007, 2015; Leung, 2013; Pietsch, 2013; Storme, Faulconbridge, Beaverstock, Derudder, & Witlox, 2016), and on international students (e.g., Alberts & Hazen, 2013; Brooks & Waters, 2011; Findlay, King, Smith, Geddes, & Skeldon, 2012; Geddie, 2015; Holloway, O'Hara, & Pimlott-Wilson, 2012; King & Raghuram, 2013; Madge, Raghuram, & Noxolo, 2015; Waters, 2012).

Drawing on the work of the sociologist John Urry (2000, 2007), the social sciences have recently developed a growing interest in everyday mobilities and the underlying material and technological embodiment of human agency. Conceptualizing social relationships as diverse connections at a distance, the emphasis of this research has been directed at the circulations sustaining such social relationships through the physical movement of people and multiple technologies of travel and communication (Sheller & Urry, 2006; Urry, 2007). Geographers have contributed to mobilities research by focusing on the practices, experiences, and representations of previously under-researched everyday mobilities across multiple scales, and their constitutive infrastructures, such as railways, motorways, and airports (e.g., Adey, 2010; Cresswell, 2006; Cresswell & Merriman, 2011; Merriman, 2012). Other authors have used related ideas for enriching work on established forms of human mobility and migration (e.g., Blunt, 2007; King, 2012; Storme et al., 2016; Waters, 2016), even if the geographer Russell King (2012) remarked critically that “the mobilities paradigm is so obviously about human movement over space and between places that geographers take this subject matter for granted” (p. 143).

The case studies included in this book can usefully be situated within Urry's (2007) “five interdependent ‘mobilities’” (p. 47) that he considers to be co-constitutive of social relationships over distances. This is because the chapters of this volume focus variously on what Urry (2007, p. 47) identified as the “corporeal travel of people” (e.g., chapter by Ellis); the “physical movement of objects” (e.g., chapter by Bloom); “imaginative travel” (e.g., chapter by Keighren); and “communicative travel” (e.g., chapter by Meusburger); while also addressing the role of “virtual travel” in contemporary mobilities (e.g., chapter by Mbah). Interestingly, Urry's (2007) focus on the material and communicative constitution of mobility systems seems to have led to the neglect of knowledge and concepts as the immaterial counterpart to material objects circulating in time and space. This resonates with Jöns's (2001, 2003, 2006) critique that actor-network theory has undervalued the focus of social constructivism on human interests, beliefs, and prior knowledge when stressing the material constitution of scientific knowledge production (see, in particular, the debate between Bloor [1999] and Latour [1999]). Her subsequent integration of these two complementary research foci in a “trinity of actants” outlines how both material and immaterial entities are produced, mediated, and transformed through the practices of humans and other “dynamic hybrids”, including non-human organisms and certain machines such as robots (Jöns, 2006), and thus need all to be considered as mediators and outcomes of socio-cultural/material relationships (Jöns, 2001, 2003).

Drawing on these insights, we suggest adding a sixth dimension to Urry's (2007) interdependent forms of mobility—circulating knowledge, concepts, and practices—as discussed in the chapter by Waters and Leung regarding the mobility of university degree programs from the United Kingdom to Hong Kong. Waters and Leung (2013) have shown that this form of transnational education has produced ambiguous results for Hong Kong graduates, with prospective employers in Hong Kong often expecting them to have gained authentic British cultural and linguistic experiences because they received a degree from a British university. Offering the British university degree in Hong Kong does, however, rarely include international mobility to the home university and thus fails to equip graduates with important embodied skills that university studies in Britain would provide (see also chapter by Waters and Leung). In a different case study context, Freytag (2003, 2016) has argued that the historically and ongoing underrepresentation of Hispanic university students and academics in comparison to their non-Hispanic White peers at the University of New Mexico, United States, can be explained by the identity struggle most of them, and especially those from rural areas, face when adjusting to Anglo-American educational practices and standards that tend to be at odds with their Hispanic cultural ideals, practices, and value systems. In both cases, the geographical movement of concepts and institutions—to Hong Kong and to New Mexico—thus devalued local cultural experiences and created the need for immobile local populations to adapt to the practices, knowledges, and values of a mobile system of educational standards representing a largely unfamiliar cultural context to them.

The suggestion to extend Urry's (2007) interdependent mobilities from five to six dimensions through the inclusion of mobile knowledge, (institutional) concepts, and practices, as displayed in Table 1.1, can be justified in two ways. Firstly, this revised set of dimensions covers themes and conceptual considerations in previous research on travel, mobility, and migration conducted in geography and associated fields about the nature, or ontology, of travelling entities that are represented in this book (see also Jöns, 2006, 2007). Secondly, this conceptual move speaks to “the open nature and strategic diversity of the mobilities field” (Faulconbridge & Hui, 2016, p. 1), thereby underlining its connectivity to a range of existing debates across the social sciences and humanities. Such an open-ended approach to conceptual debates informed by previous studies also helps to shed a slightly different light on some of the novelty claims and hyperbole of the “new paradigm” language that inform key writings on what Urry (2007) himself presented as the new “mobilities paradigm” (p. 44). This is because recent work identifying with this agenda has indeed extended the researchers' gaze to previously under-researched scales and themes in a rapidly diversifying intellectual debate about travel, mobility, and migration, but at the same time this work has neglected links to well-established lines of inquiry such as Castells's (1996) concept of the “space of places” and the “space of flows” (pp. 423–428) as the two main spatial logics of human societies (see chapters by Taylor and Beaverstock). A closer engagement with this concept and Castells's (1996) three layers—the “material support of the space of flows” (p. 412), namely “a circuit of electronic impulses” (p. 412), “its nodes and hubs”

Table 1.1 Six interdependent forms of mobility

No.	Mobility of	Examples of knowledge production	Conceptual ideas	Authors
1.	Material things	Samples, specimen, instruments, books	Economic capital and objectified cultural capital Immutable mobiles	Bourdieu (1986) Latour (1987)
2.	People, other organisms, and robots	Students, researchers, military dolphins, Mars rover	Cyborgs Dynamic hybrids	Haraway (1991) Jöns (2006)
3.	Knowledge, concepts, and practices	Experiences, skills, institutions, forms of governance	Institutionalized and embodied cultural capital Ideoscapes	Bourdieu (1986) Appadurai (1990)
4.	Imaginations and representations	Geographical imaginations, stereotypes, mental/visual images, big bang theory	Orientalism and Eurocentrism Symbolic capital	Said (1978) and Gregory (1998) Bourdieu (1984)
5.	Communication	Speech, phone, letters, fax, text messages, emails, signals	Local buzz and global pipelines Communicator–recipient model	Bathelt et al. (2004) Meusburger (2009)
6.	Virtual information	Internet browsing	Technoscapes Information technology revolution	Appadurai (1990) Castells (1996)

Adapted from Urry, 2007, p. 47; Jöns, 2001, p. 118; Jöns, 2006, pp. 573–574 (Design by authors)

(p. 413; e.g., hi-tech parks, global cities), and “the spatial organization of the dominant, managerial elites” (p. 415)—might have shed a different light on Urry’s assessment that Castells’s (1996) “account is overly cognitivist” (Urry, 2007, p. 163) and thus prevented a similar conceptual oversight of knowledge and concepts as in one of its main sources of inspiration—actor-network theory (Jöns, 2006).

Building on a rich literature about knowledge production and dissemination in different disciplines, we define the rather elusive concept of knowledge in agreement with the sociologist Nico Stehr (1994) “as a capacity for social action” (p. 95). This capacity can relate to *codified* (or *explicit*) knowledge as “the kinds of knowledge that can be expressed formally in documents, blueprints, software, hardware, etc.” (Dicken, 2015, p. 108), thus representing the *know-what* and *know-why*, or to *tacit* (or *implicit*) knowledge as “the deeply personalized knowledge possessed by individuals that is virtually impossible to make explicit and to communicate to others through formal mechanisms” (Dicken, 2015, p. 108), also referred to as the *know-how* and *know-who* (Williams & Balaz, 2008, p. 57; for a critical perspective

on this codified/tacit binary, see chapter by Meusburger). Accordingly, the economic geographer Edward Malecki (2010) regards knowledge as being “more than data and information...less than competence, expertise, creativity and, certainly, wisdom...A simple view of knowledge, then, is that it is accumulated information and prior knowledge, providing skills and insights that can be used in future contexts” (p. 498).

From a geographical perspective, Meusburger (2000) has argued that it is of prime importance to differentiate between different types of knowledge and information because these imply varying degrees of spatial concentration, availability, and transferability, for example, when studying the spatial organization of work places. He showed that in a vertical division of labor, jobs requiring expert knowledge and highly skilled decision making are to be found at the upper level of organizational hierarchies and tend to be spatially concentrated, whereas low-skilled, routine tasks in production and services are mostly situated at lower levels of organizational hierarchies and spatially more decentralized, thus giving rise to complex spatial patterns of centers and peripheries that persist for a long time but also change due to organizational restructuring and the migration of people with different sets of skills (Meusburger, 1980, 2000).

According to Meusburger (2000, 2008), at least four types of knowledge and information can be differentiated based on their spatial ontology: (a) secret knowledge that is spatially most concentrated and not released as long as its control provides a competitive advantage and increased power; (b) tacit knowledge that is spatially concentrated because it is embodied in a select number of often talented and well-educated people—such as the Humboldt brothers—and requires advanced skills and often face-to-face interactions to be fully understood; (c) codified knowledge that is more widely available but also requires previous training to be taken on, decoded, and employed further; and (d) information that is widely available and highly mobile because it is easily articulated, disseminated, and understood without (much) prior knowledge, with its distribution being as ubiquitous as the required communication channels and infrastructure.

Depending on the degree of complexity and specific conditions at the site of both producers and receivers, these different types of knowledge and information also travel across space at varying speeds and are understood more or less easily by their potential receivers. Successful transfer of knowledge and information largely depends on the interest of knowledge producers to release knowledge and information (free of charge) and their abilities and resources to create and finance infrastructures and platforms required for such transfer to occur. The outcome is also contingent on the receivers’ prior knowledge, level of information, access to communication technologies and (temporary) knowledge clusters, and their ability and willingness to accept received content that may conflict with their personal experiences, values, and cultural identities—an aspect that is inextricably linked to that information’s usefulness to those in power or those gaining power (Meusburger, 2000, 2008; and chapter by Meusburger).

Drawing on work about the role of travel for the production of knowledge across the sciences and the humanities, Jöns (2003, 2007) found that the need for

geographical mobility arises partly from the place-specificity of different research practices and varies systematically along two dimensions: firstly, different degrees of materiality and immateriality (hence their conceptual integration in a trinity of actants); and secondly, different degrees of standardization. If the constitutive entities of knowledge-producing practices are characterized by a high degree of materialities that cannot be moved easily, such as field sites, groups of people, events, technical infrastructure, and archival documents, researchers may need to access specific places for their research at least once, as was exemplified by Alexander von Humboldt's highly mobile life as a transcontinental scientific traveler. Those scientists and scholars working primarily with immaterialities, such as theories, concepts, and ideas, are, in contrast, as mobile as the physical vehicles of these immaterial entities allow them to be (e.g., the researchers themselves, collaborators, computers, books). This means that they could theoretically work in different locations but often do not need to travel at all, and thus historically either conducted their research at home or traveled for informal peer discussions (Heffernan & Jöns, 2013). In Wilhelm von Humboldt's professional life, this was expressed through his largely sedentary humanistic research and writing in Jena, Paris, Rome, and Berlin.

In the case of a high degree of materiality, unstandardized physical field sites may be unique and thus require access through research travel, whereas highly standardized laboratory equipment may be found at several sites accessible to the networks of science, thereby offering more choice in regard to the research location. Within the theoretical sciences that show a higher degree of immateriality, research practices range from highly standardized, thus more ubiquitous, discourses in the natural and technical sciences (e.g., formulas) to less standardized, thus more place-specific and individualized, argumentative-interpretative work in the arts and humanities (e.g., writings building on a range of different authors and perspectives). The resulting three-dimensional matrix on the spatial relations of different research practices at different stages of the research process illustrates that the more immaterial and standardized the research practice, the lower is the place-specificity of one's work and the easier it would be to work at home or elsewhere; and the more material and unstandardized the research practice, the higher is the need for geographical mobility (Jöns, 2007).

Mobilities of knowledge thus vary substantially by the type of knowledge, subject-specific research practices, and the stage of knowledge production and dissemination. This needs to be considered when comparing the chapters in this edited book about mobilities of knowledge in different historical geographical contexts, sectors, and practices of both past and present knowledge-based societies (Burke, 2000). Generic concepts explaining the close links between fixities and flows (Cresswell, 2006), places and mobilities (Merriman, 2012), and centers and circulations (Jöns, 2015) in the constitution of Foucault's (1977) power/knowledge include De Certeau's (1986) notion of the "stockpiling" (p. 146) of knowledge through a series of episodic circuits involving a repetitive going out into the world and returning to a home base, where the accumulated knowledge and information are combined and interwoven to coherent and often linear narratives. Crang (2003) pointed out that Latour (1987) depicted this relationship in fairly similar ways when

discussing systematic “cycles of capitalization” in “centres of calculation” (p. 220) that have multiplied since early modern times and contributed to the global diffusion of European science, capitalism, and imperialism (see chapter by Jöns). The latter can be understood as venues in which the production of new knowledge builds upon the mobilization of heterogeneous resources that are subsequently systemized, classified, combined, and transformed to create new intellectual arguments and knowledge products.

Repeated circular movements have played a particular important role in the rise of knowledge centers, but Jöns (2015) has further argued that both incoming and outgoing circular, linear, and reciprocal movements can contribute to cumulative processes of knowledge production in the host and the home institutions and thus raise their centrality within local, regional, national, and global knowledge networks. The idea that multidirectional mobilities of knowledge can reinforce the centrality of particular sites is particularly evident in Castells’s (1996) notion of the “space of places” and the “space of flows” (pp. 423–428) because the movement of mobilities within the constitutive circuits of electronic exchanges, as well as of the flows of managerial elites between global cities, can be circular, linear, or reciprocal. The chapter by Taylor uses this theoretical framework to clarify controversial debates in archaeology and the social sciences about the origins of cities and agriculture by pointing out that flow-based cities preceded the rise of place-based agriculture.

Against these conceptual backgrounds, the peer-reviewed essays of this book are grouped according to two different research foci on the mobilities of knowledge. In the first part, authors examine the circulation, transfer, and adaptation of knowledge and its constitutive (im)materialities with an emphasis on the inter-personal communication process (chapter by Meusburger), techniques of papermaking (chapter by Bloom), the production and circulation of a geographical text (chapter by Keighren), indigenous knowledge in European exploration (chapter by Driver), the genealogy of spatial analysis (chapter by Barnes and Abrahamsson), and different disciplinary knowledges about the formation of cities and agriculture (chapter by Taylor). In the second part, authors analyze the interplay of mediators, networks, and learning by studying academic careers, travels, and collaborations for knowledge production in the British empire (chapters by Ellis; Pietsch; Jöns), public internationalism in early twentieth century Geneva (chapter by Herren), the mobility of corporate knowledge through expatriates in global cities (chapter by Beaverstock), graduate mobility from the global south to the global north (chapter by Mbah), and the mobility of higher education degree programs from Britain to Hong Kong (chapter by Waters and Leung).

The transfer and adaptation of knowledge and ideas has traditionally centered on human beings interacting in environments more or less instructive for such exchange and has subsequently been mediated by different communication technologies. Peter Meusburger’s chapter examines the microprocesses that shape the communication of different types of knowledges between a source of knowledge and its potential recipient. Emphasis is on the reasons why the communication of different types of knowledge and information is more or less successful and how this process

is shaped by different environments. Meusburger argues that a comparable level of prior knowledge and expertise on the side of the source and the potential recipient is crucial for successful knowledge transfer to occur, and that new communication technologies have increased rather than decreased spatial inequalities in the access to knowledge because only relatively standardized and lower value knowledge and information are freely accessible and comprehensible, whereas higher value and tacit knowledge require previous investment of time and money on the side of the recipient in order to be fully understood and utilized. This problematizes the popular binary of implicit/explicit knowledge and means that not only knowledge sources but especially competent receivers are spatially more concentrated than in the case of lower value types of knowledge and information. By discussing several steps of the communication process that can lead to misunderstandings, distortions, loss of information, and an eventual failure of knowledge transfer, Meusburger's outline of a communication model opens up avenues for future research on knowledge transfer in different empirical contexts.

Jonathan Bloom's chapter provides a detailed account of the transfer of paper and papermaking from central China, where it emerged c. 200 BCE, through mercantile and missionary traffic via the Islamic lands to Europe in a journey that lasted more than a millennium and was only completed by the 1500s. Bloom shows how the nature of paper and the spatial diffusion of the material practice of papermaking were shaped by the regional availability and cultural preference of raw materials and also transformed in different local environments according to the most suitable processing technologies such as human-, water-, or wind-powered paper mills, thereby being mediated by both varying physical and cultural contexts. Bloom's account also discusses how paper replaced the more traditional writing materials papyrus and parchment in the Arab Mediterranean lands, encouraging an extraordinary period of flourishing book-learning and scholarship, and how the Europeans subsequently adopted the technique of papermaking in such an efficient way that they quickly supplanted Arab producers of paper in their home markets through growing exports. By outlining the paradox that this longstanding and complex cultural geography of papermaking was subsequently largely forgotten in Europe and thus gave rise to the Eurocentric myth that the Chinese learned this technique from the ancient Egyptians, Bloom highlights the need to interrogate popular discourses and established bodies of knowledge through careful historical geographical scholarship.

By the time of Innes Keighren's case study on the production and circulation of the book *Travels in Europe, Asia, and Africa* (1782), paper-made books had become the main source in Britain and other European countries for informing wider publics about different places near and afar. Keighren's entertaining narrative traces how this first extra-European travel account published by John Murray, Britain's leading publisher of travel accounts in the nineteenth century, was mediated, translated, and received by multiple audiences in Britain, Ireland, Germany, and France. Keighren unravels how critics suspected that this highly popular anonymous and politically contentious account based on letters of the commercial traveler William Macintosh had been covertly upgraded in style by an accomplished literary editor. He discusses

how this lowered the credibility of the book's truth claims and impacted Murray's subsequent publishing practices but did not diminish the book's overall success. Within Britain, the book's radical content in the form of a highly critical account of Britain's imperial rule in India, in particular of the East India Company, stimulated harsh protest and refutation by offended colonial administrators, while it facilitated its republishing in Dublin and translations into German and French because it appealed to fellow humanists abroad. By arguing that the sophisticated strategies employed for appropriating the presentation of Macintosh's book to the needs of diverse interest groups outside of Britain facilitated its travels but changed the meaning of its political and geographical content through contextualization, Keighren stresses that successful knowledge transfer between different cultural contexts requires epistemological adaptation.

Driver's chapter discusses how conventional narratives of European exploration can be critically interrogated by unearthing the hidden histories of exploration from the archives. His chapter outlines some of the inclusive strategies that his team of researchers developed in collaboration with exhibition designers and colleagues at the Royal Geographical Society with the Institute of British Geographers (RGS-IBG) when preparing the exhibit *Hidden Histories of Exploration* at the RGS-IBG. The first strategy was to present the exhibit on two levels of the RGS-IBG in order to enroll the interested public in active knowledge production through access to the otherwise exclusive RGS-IBG research library. The second strategy aimed at telling the stories of largely forgotten indigenous people and intermediaries in the course of nineteenth and early twentieth century European explorations by valuing their local support and contributions to the explorers' growing knowledge and expertise as much as that of the often well-known, and heroically commemorated White explorers through the juxtaposition and naming of hitherto unnamed people carrying equipment, taking photographs, and guiding the way through territory familiar to them but not the explorers. Driver's account shows that in the late nineteenth century, it often required unconventional voices, such as that of the British colonial governor's daughter, to document biographical details of supportive Swahili women and to record their individuality and achievement in visual and textual form, but that by the mid-twentieth century, partly on the initiative of local populations, explorative knowledge production was increasingly portrayed as the collective endeavor it had always been.

During the 1950s, a new paradigm emerged in university-based geographical knowledge production—spatial analysis. The chapter by Trevor Barnes and Christian Abrahamsson traces the recorded development of this mathematical approach to the analysis of complex geographical configurations back to Alexandria in ancient Greece. It was then prominently taken up in fifteenth-century Bologna, mid-seventeenth century Amsterdam and late seventeenth-century Cambridge before it gained popularity via Walter Christaller's (1933) notion of central place theory in Freiburg, Tartu, and Lund and began to shape Anglo-American human geography, especially in Iowa and Seattle, during the 1950s and 1960s. Barnes and Abrahamsson conceptualize their geographical history of ideas as place-based knowledge production in creative milieus provided by heterotopias (Hetherington, 1997), truth spots (Gieryn, 2002), and centers of calculation (Latour, 1987) that are

linked with each other and to further places by diverse mobilities and circulations of people, resources, and ideas. Their people-centered account confirms the important role of academic mobility and migration for the international transfer of ideas, and stresses two further conceptual points, namely that the spatial science approaches transformed and evolved along the way and, as Burke (2000) has shown for early modern intellectual movements, could only flourish at a new and a peripheral institution because these were not under the spell of the regional geography paradigm and networks dominating human geography in the United States at the time.

Peter Taylor's chapter challenges conventional disciplinary knowledges in archaeology and the social sciences about the origins of cities, states, and agriculture. Taylor argues that the path dependency of academic knowledge production since the nineteenth century, when a division of labor between different university disciplines emerged, has resulted in an emphasis on understanding the emergence of states in the social sciences and agriculture in archaeology, thus leading to a neglect of the significant role of cities as drivers of social change. With a flow-based conceptualization of practical knowledge production in ancient trade networks that led to the formation of trade hubs, which subsequently grew into cities, Taylor develops the revolutionary argument that cities as centers of practical knowledge production produced both place-based states and agriculture. By examining the formation of disciplines in the nineteenth century, he explains that this reversal of prominent narratives in the social sciences and archaeology can only be proposed by an outsider who has not been indoctrinated with the apparent truths of long-established and reproduced disciplinary canons and can therefore interpret existing findings in a novel way. Taylor's chapter is thus a prime example of how a geographical perspective, which is open to epistemological pluralism because of its intradisciplinary diversity (King, 2012), can productively link debates about academic and practical knowledge production and help to question established truths produced within more rigid disciplinary frameworks.

From the perspective of people as key mediators of knowledge production and dissemination, the second set of essays demonstrates how important people's embeddedness within networks is for processes of learning, education, the production of new knowledge, and professional careers. Heather Ellis' chapter adds to debates about the role of empire for the production of knowledge by interrogating the extent to which British and other European academics identified with the British imperial project when using its infrastructures for their research during the nineteenth and early twentieth centuries. By examining the travels and collaborations of university scientists and scholars across the sciences and the humanities, she fleshes out a diverse spectrum of constellations, ranging from those individuals who were interested in supporting the cause of empire through their academic research, via those who used imperial infrastructures for their work but also ventured out of imperial territory if academic needs arose, to cosmopolitan academics propagating scientific internationalism, and those who, in similar ways as Keighren's William Macintosh a century earlier, actively critiqued imperial practices. Ellis therefore argues that the geographies of academic mobility and collaboration were not necessarily linked to the researchers' identification with wider political projects such as

British imperialism but often mediated by convenient transport and research infrastructure. In her opinion, those more open-minded academics from Britain and elsewhere, who made empire what she calls “a truly international space of research,” would deserve more scholarly attention in future studies.

Pietsch’s chapter examines more permanent but still frequent moves of academics for university positions between Britain, its settler empire, and other colonies by discussing the varying and changing nature and geographies of appointment practices at universities in Britain, Canada, Australia, New Zealand, South Africa, India, and South East Asia from the 1850s to 1940. Pietsch shows how in this period the gradual professionalization of academic work, prominently marked by the appointment of the Royal Commissions on Oxford and Cambridge in 1850, 1872, and 1919, and its progressive specialization meant that appointment criteria evolved from personal patronage and the word of scholarly gentlemen, via appointments based on the assessment of a combination of merit, such as first-class examination performance, and gentlemanly character through generalist selection committees, to specialized assessment procedures based on a combination of discipline-specific appointment committees, interviews, and personal knowledge about the candidates. These changing appointment practices remained strongly grounded in personal systems of trust, but Pietsch outlines how their nature varied in different places by cultural habits, forms of governance, and distance from Britain and became more independent from the British motherland over time. The resulting geography of imperial appointment practices based on British and antipodean alumni and friendship networks saw a highly exclusionary, classed, gendered, and raced reproduction of what Pietsch (2013) called the “British academic world” in settler universities, leaving out women, Jewish, Indian, U.S. American, and non-British European scholars, the latter two of whom constituted their own academic circuits (Honeck & Meusbürger, 2012).

Examining the changing geographies of academic travel from the University of Cambridge across all disciplines from the 1880s to the 1950s enables Heike Jöns to assess in her chapter the extent to which Cambridge academics travelled to different parts of the British empire in comparison to other destinations. Her study shows how imperial destinations were frequented more in the decades before 1945 than in the one afterwards but consistently less than the emerging hegemonic research institutions in the United States. These geographies varied not only by discipline and research practice but also by different types of academic work because the United States was most often visited for invited lectures, visiting posts, and research, whereas colonial destinations attracted most academics for advisory work and research, especially at the crisis-prone eve of decolonization that led to a postwar shift of imperial travels from British India to British Africa. Jöns exemplifies the close link between academic expertise, imperial governance, and friendship networks using the example of the most frequent overseas traveler from Cambridge in the period of interest, Sir Frank Leonard Engledow, Drapers’ Professor of Agriculture from 1930 to 1957. By advising colonial governments and corporate institutions on tropical agriculture, Engledow contributed to Britain’s colonial reform movement of the late 1930s, to African postwar empowerment through education, and to an

increasingly uneven integration of different parts of empire into British academic networks. However, due to his focus on imperial networks and the tropics, he did not participate in the growing Americanization and Europeanization of academic travel from Cambridge after 1945. Drawing on Tilley (2011) and complementing Ellis's analysis, Jöns argues that because of Engledow's ambivalent positionality, his academic advisory work both supported and undermined imperial rule.

Ambivalence is a concept that also features prominently in Madeleine Herren's analysis of the spatialities of public internationalism in interwar Geneva as she argues that this characterized the international "spirit of Geneva" after World War I. Herren's innovative place-based analysis aims to trace the "local buzz" (Bathelt, Maskell, & Malmberg, 2004) through accidental meetings between decision-makers of international organizations by analyzing the spatial arrangements of key institutions in relation to their workforces' places of work and residence in the city. At the heart of this cluster of public internationalism without diplomatic quarters (because Bern was Switzerland's capital) resided the Palace of Nations that opened in 1938 as the new home of the League of Nations and functioned as a global meeting point predestined for international knowledge transfer within its bar and assembly hall. Based on the earlier presence of the International Committee of the Red Cross, a range of humanitarian, pacifist, religious, and non-governmental organizations located nearby, thus constituting a spatial cluster of global expertise. Herren argues that the spatial proximity of these European, non-European, and international institutions, as well as the interspersed offices and private rooms of key decision-makers, suggests the existence of interactions, knowledge exchange, and networks across organizational and political boundaries that are hitherto undocumented and deserve further examination because of their likely explanatory power. By maintaining that these contact zones not only involved civil servants and administrators but also a large number of "subaltern diplomats," such as typists, translators, and drivers, as largely overlooked mediators of global discourses, who are difficult to identify with established methods for researching transboundary networks, Herren opens up new avenues for geographically sensitive historical research.

Jonathan Beaverstock's chapter unpacks the notion of expatriation, or international assignments, as a form of labor mobility within and between firms as the most efficient and cost-effective strategy for the international transfer of tacit knowledge in the world economy. Drawing on conceptual resources developed in the field of international human resource management since the 1960s, Beaverstock discusses the importance of expatriation for transnational companies as a strategy to fill vacancies in local labor markets; to enhance the skills, capital base, and careers of their employees; to share knowledge and best practice between headquarters and subsidiaries; to serve clients in co-location; and to offer tailor-made solutions to a diverse set of clients. Even in an age of increasingly integrated information and communication technologies, the transfer of tacit knowledge via face-to-face contacts is of such importance that the volume of international business assignments has been predicted to double in the decade 2010–2020. Due to the location of most transnational companies in world cities, these are conceptualized as the nodes that create, maintain, nurture, and develop global talent, especially in professional

services, thus reproducing the centrality, competitiveness, and cosmopolitanism of cities in the world city network. Beaverstock argues that expatriation as a form of physical mobility of employees within and between transnational companies will remain a key business strategy for the transfer of corporate knowledge within and between firms, and with their clients, despite the growing importance of information and communication technologies and shorter-term business travel, because value and skills are embodied in employees who are pivotal for a business's reputation, credentials, and successful employee-client relationships.

Melanie Mbah's chapter directs attention to "the triple nexus of education, migration, and integration" by analyzing the transnational migration experience of highly skilled Nigerians in the three destination countries Germany, the United Kingdom, and the United States as well as among the alumni of three Nigerian universities. Mbah identifies migration as a long-standing feature of Nigerian culture linked to early forms of nomadism, British colonial policies, and a postwar surplus of secondary school graduates as an important stimulus for migration. She shows that education, in the form of both received formal education and desired further higher education abroad, has been a key facilitator of migration, as have been often idealistic imaginations of a better life abroad and large family networks at home and abroad that have a vested interest in reproducing their cultural and financial capital through transnationalism. Based on the analysis of migration drivers and experiences, Mbah suggests two conceptual frameworks that help to understand the complexity and dynamics of the migration and integration process. The first is a sixfold typology of West African migrants that allows for multiple changes of status over time through integration, return migration, and transnationalism and links specific migrant types to typical knowledge flows between source and destination countries. The second considers the personal and structural contexts that shape changing migration aims at five moments of the migration and integration process, from initial considerations to different experiences in the destination countries. By discussing migration and integration as multidimensional and multidirectional, dynamic and flexible processes generating changing desires for permanent, return, and shuttle migration, Mbah provides a much nuanced assessment of how the multiple migration trajectories of highly skilled Nigerians to Europe and North America generate context-specific outcomes of brain drain, brain waste, brain gain, and brain circulation.

Corporeal mobility is not the only strategy for gaining access to international higher education. The chapter by Johanna Waters and Maggi Leung critically examines the types of knowledge and forms of capital transferred to immobile students who enrolled in over 600 degree programs delivered in the second decade of the twenty-first century by more than 35 U.K. universities at bachelor's, master's, and PhD levels in Hong Kong's higher education institutions. Drawing on Bourdieu's (1984, 1986) outline of economic, cultural, social, and symbolic forms of capital that individuals can accumulate through socialization, interaction with others, (birth) rights, education, work, and networking, Waters and Leung challenge the

widely promoted, conventional view that transnational education is unproblematic by unravelling the ambivalences of transnational education programs. The main problem they depict is that students' prime interest in increasing their employability is hampered because flying faculty programs, delivered by visiting U.K. academics, may provide transnational social capital but often hinder students' learning experience due to both their lacking English language skills and U.K. case studies irrelevant to the Hong Kongese context, whereas franchise programs delivered by locally sourced lecturers might have been adjusted to more place-specific case studies but often do not develop students' English language skills as a main criterion for employability in transnational companies because local lecturers tend to revert to Cantonese. Waters and Leung thus argue that operating in a transcultural space complicates the acquisition of cultural and social capital and requires educational providers to pay much more attention to the complex geographies of knowledge transfer and institutionalized cultural capital.

In conclusion, this collection of essays demonstrates the value of a profoundly comparative historical geographical perspective on mobilities of knowledge that covers case studies from the centuries before the common era to the present in a variety of world regions and at the global scale in order to identify generic as well as time- and place-specific practices and processes of knowledge production, dissemination, and transfer. Examples for generic processes are provided by the insights that knowledge production and dissemination are constituted by diverse circulations of people and (im)material resources, depend especially on prior skills, mentors, informants, and support networks, and require the critical interrogation of established truths and disciplinary narratives in the light of new empirical and conceptual considerations (chapters by Driver, Taylor, Ellis, Jöns). Knowledge transfer, which acknowledges the almost inevitable transformation of mobile knowledge, necessitates specific interests and skills on the side of both the communicators and recipients and the adaptation of the circulated knowledge to different contexts and audiences (chapters by Meusburger, Bloom, Keighren, Barnes and Abrahamsson). It is facilitated by face-to-face contacts in knowledge clusters such as cities as the most complex and widely networked nodes in historical and contemporary spaces of flows (chapters by Herren and Beaverstock) and proceeds relatively easily within established epistemic communities and friendship networks, which explains the social and epistemic reproduction of knowledge and careers in distinct classed, raced, and gendered personal and cultural networks; complications mostly arise at the intersection of different cultural and institutional practices and value systems (chapters by Pietsch, Mbah, Waters and Leung). In the words of Wilhelm von Humboldt, betaking "to the things themselves" is therefore a sustainable strategy for producing context-specific empirical insights that should inform flexible conceptual interpretations on the mobilities of knowledge—past, present, and future.

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