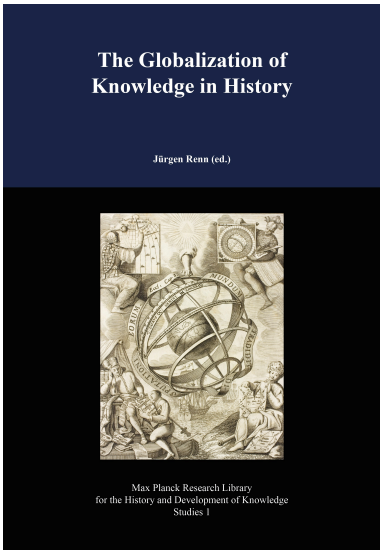
Max Planck Research Library for the History and Development of Knowledge

Studies 1

Jürgen Renn:

Survey: The Place of Local Knowledge in the Global Community



In: Jürgen Renn (ed.): *The Globalization of Knowledge in History*
Online version at http://edition-open-access.de/studies/1/

ISBN 9783844222388
First published 2012 by Edition Open Access, Max Planck Institute for the History of Science under Creative Commons by-nc-sa 3.0 Germany Licence.
http://creativecommons.org/licenses/by-nc-sa/3.0/de/

Printed and distributed by:
Neopubli GmbH, Berlin
http://www.epubli.de/shop/buch/17018

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de

Chapter 16
Survey: The Place of Local Knowledge in the Global Community

Jürgen Renn

16.1 Local Knowledge in the Niches of a Globalized World

Local knowledge is a relational concept, to be defined only with regard to a particular historical situation as well as to its genesis and future development. It describes those social competencies in solving problems and anticipating their solutions that are not part of a globally dominant constellation, but rather are associated with a geographically or socially limited spread. Local knowledge in this sense may have been once part of globalized knowledge or harbored the potential to become so in the future, "local" not necessarily being an intrinsic quality of the knowledge. Local knowledge may evolve into less local or even global forms diachronically, that is, by becoming part of a tradition connecting spaces that temporarily relate to each other, and synchronically, that is, by becoming part of an exchange connecting different spaces simultaneously contributing to this evolution of knowledge. Like globality, locality itself is not a given, but is rather the result of historical processes. Local knowledge emerges from or is pushed into the niches of a world which, in all historical situations, is more or less connected and determines these niches as those spaces that are for the time being not part of the connectivity.[1]

Local knowledge connected with traditional techniques for mastering primary living conditions, such as food production, medicine, architecture and mobility, may seem, due to economic globalization processes, to be generally on the retreat, confronted as it is with the economic and technological powers of global capitalism. On closer inspection, however, it has turned out that this global capitalism has itself, in the course of its emergence, critically benefited from the local knowledge that it now appears to repress. As Marshall Sahlins states:

> Rather than a planetary physics this is a *history* of world capitalism—which, moreover, in a double fashion will testify to the authenticity of other modes of existence. First by the fact that modern global order has been decisively shaped by the so-called peripheral peoples,

[1] Local knowledge in the sense used here may also be designated as situated knowledge in the sense of Susanne Rudolph (2005, 12), emphasizing the close relation between knowledge and practice.

> by these diverse ways they have culturally articulated what was happening to them. Second, and despite the terrible losses that have been suffered, the diversity is not dead. It persists in the wake of Western domination (Sahlins 2000, 418).

In times of colonialism, "local" knowledge of medicine had in fact become part of a global communication system.[2] Later, in the period of imperialism, such autochthonous medical knowledge was increasingly marginalized by supposedly superior knowledge about tropical diseases, for instance, which also served to legitimize European domination (Haynes 2001). However today, local knowledge is anything but obsolete in view of its role both for survival in the niches of globalization and for its potential to offer globally relevant and alternative solutions. Before exploring this potential further, let us take a brief look at how local knowledge was pushed into these niches and then consider in more detail one example which may clarify the nature of local knowledge as well as its developmental potential. A short survey of the international situation around 1900 may help to assess the global power constellations largely determining the relation of local and global knowledge systems.

By the beginning of the twentieth century, the presence of Western military power, capital, products, science, technology and ideologies could be felt in virtually every part of the world.[3] In Europe and North America, strong industrial and commercial centers had evolved which formed the basis for dominating the more southern and eastern parts of the world, either directly through political and military control or indirectly through political, commercial and cultural influence.

In Latin America, post-colonial nation states had emerged from struggles for independence since the beginning of the nineteenth century. Their economy remained characterized by the export of primary resources and agrarian products and was dominated by foreign commercial powers, such as Great Britain and the United States. Elites with European roots and globalized urban life styles coexisted with indigenous societies more or less affected by processes of globalization. The history of Latin America in the late nineteenth and early twentieth centuries was shaped by Western models of industrialization and modernization, a strong dependency on the global economy and conflictual political attempts to deal with the consequences of this dependency, often leading to authoritarian rule.[4] This constellation has been conceptualized by dependency theory which explains first the relationship between the newly independent states in Latin America and the leading economic nations and second the role of elites within those states (Cardoso 1977).

[2]This is shown by Sabine Anagnostou (2000). Similarly, Nicholas Thomas (1991) describes Polynesian-English trade relations and economic entanglement in eighteenth and nineteenth centuries not only as an indicator of an entrance of autochthonous people into the Western capitalist system, but as a mutual exchange of knowledge.

[3]For the following, see (Osterhammel 2009) and also (Anders and Münter-Elfner 1999; Steger 2003).

[4]See, for example, (Halperín Donghi 1985).

Since the late nineteenth century, most of Africa has been divided into colonies of European powers by artificially drawn boundaries. Local economies and societies were destroyed or reshaped according to European priorities in global political and economic competition, focusing almost exclusively on the exploitation of primary resources.[5] A major event at which such far-ranging decisions were taken is the Berlin Congo Conference of 1884–85. The redrawing of boundaries and domains of political influence eventually led to the emergence of new social and political constituencies. Investments in infrastructure did contribute to the spread of goods, technology and knowledge. But they were directed primarily by the interests of the colonial powers rather than by the aim to improve the living conditions of the local population in terms of education, water management or public health. The strategy to consolidate western domination by investments in infrastructure emerged around 1900, but was massively implemented only after World War II when the necessary economic resources were available and when the struggle for independence provided the urgency and motivation.[6]

Also, large parts of Asia were under European control. India belonged to the British Empire, whereas Southeast Asia was, for the most part, under the domination of other Western powers, such as France, the Netherlands and the United States. The United States became a colonial power on the Philippines and the Mariana Islands after the Spanish-American War in 1898. In India, the British Empire established a society parallel to and above the indigenous ones in order to enlist, educate and corrupt local elites for the purpose of colonial control.[7] China retained its dynastic rule but became the pawn of European interests (Petersson 2000), while Japan—not least deterred by the Chinese example—made successful efforts to maintain its independence and to become a colonial power in its own right (Conrad 2005). In fact, Japan entered the realm of global economic and political competition more or less on its own terms by appropriating Western means and methods of gaining and exerting power, such as military technology, industrialization and science (Beasley 2001, chap. 9). In the process, Japanese society kept its non-Western identity yet allowed for globalized scientific and technological knowledge to replace local traditions (Inkster 2001). A striking example for the dialectics of takeovers of foreign knowledge and its appropriation is the way in which Japanese national history was constituted on the model of German national history with the aim to substantiate Japanese claims of autochthony (Conrad 2004, 2007). In China, the last dynasty eventually crumbled under the combined pressures of European interventions and internal instability, eventually making way for a fragile and superficial republican order that imitated Western models; this was quickly taken apart by struggling warlords (Waldron 1991; McCord 1993).

[5] See (Oliver and Fage 1962, 172–174). Frederick Cooper (2005, 182–83) gives economic reasons for colonial expansion in the context of rivalry between different European empires which were the motivation for expansion and exploitation.

[6] For infrastructure as an instrument of consolidation of imperial power, see (van Laak 2004).

[7] See, for example, (Metcalf and Metcalf 2002).

In Australia, then part of the British Empire, the indigenous population was marginalized by white settlers (Rowse 1999, 635). Most of the indigenous population of the Pacific islands was exterminated during the nineteenth century by imported diseases such as measles and influenza, but also due to imported weapons that changed the character of local conflicts into deadly wars. Other parts of the population were either killed or enslaved by Western colonizers (Bushnell 1993; McNeill 1994).

The gradually emerging global infrastructure of transport, commerce, communication and administrative control had, however, not yet penetrated the interior of all countries and continents, some of which were thus affected only peripherally by the economic and political globalization processes in the sequel of colonization and industrialization. Remarkably, this gradual and sometimes halting diffusion of global infrastructure was not just characteristic for pheripheral areas of colonization, such as the interiors of Amazonia or Sub-saharan Africa, but also for areas in the focus of colonial efforts, in particular, North America, thus constituting the emphatic notion of "frontier" (Waechter 1996). Alongside brutal suppression in the colonized territories, the destruction of non-European societies and the exploitation of their people and resources, some societies, for instance in New Guinea or Micronesia, were able to subsist using traditional economic practices and local knowledge essentially transmitted unchanged over centuries.

Over the course of history, many types of local knowledge have evolved and disappeared. Local knowledge is embedded in specific social and natural contexts, which often serve both as its object and as a medium of its expression, such as when spatial knowledge is encoded by landmarks. Accordingly, when such contexts change due to migration, for example, or when habitats are destroyed or new technologies open up new ways to solve "traditional" problems, for instance regarding mobility, local knowledge is easily lost. Local knowledge is part of traditions that are invented and that vanish under specific historical circumstances (Hobsbawm 1983). Many kinds of local knowledge have thus been lost in human history. One of the greatest losses worldwide was due to European colonization and its consequences.

16.2 Intrinsic Versus Extrinsic Development of Local Knowledge and the Example of Local Navigation Techniques

Some kinds of local knowledge have been preserved over major historical breaks by simply adapting it to new circumstances, for example, when wire is used instead of liana to build houses according to local traditions, as is the case with indigenous populations in Brazil. Other kinds of local knowledge have further evolved and become part of globalized knowledge, in particular, by being networked with other knowledge and by overcoming its context-dependence in higher-order structures of reflection. This process, which must have also happened to some of the local knowledge at the origin of European expansion, is characteristic of the intrinsic

development of a system of knowledge.[8] It is, however, important to emphasize the fact that not only European knowledge was globalizing. Even in colonial situations knowledge and epistemological systems of other provenance became important parts of globalized knowledge.[9]

A telling example are navigational techniques that depend on observing the stars, which must have emerged as local knowledge all over the world.[10] In the course of the development of Western science, this knowledge was eventually able to take into account the different ways in which the stars appear in different parts of the world, thus overcoming its context-dependence. However, such an intrinsic development does not necessarily lead to a system of knowledge that is better able to solve a given local problem. For more than a thousand years, traditional Polynesian and Micronesian navigational techniques have enabled sailors to undertake long-distance trips between islands that would take them several days out of the sight of land (Oliver 1989). In Western imagination and thinking, islands are genuine places where traditional knowledge is preserved from any change. This "isolated" geographical situation of islands gives way to a misconception of island societies as ahistorical and their social subsystems as unchangeable. In consequence, anthropologists and historians who commend the maritime ability of Polynesians often neglect the consequences such skills had for the exchange of goods and knowledge. But even precolonial contact between different islands was able to alter societies and knowledge systems, as is underlined, for example, by Nicholas Thomas (1997). The knowledge underlying these techniques comprises elements that from a Western perspective fall into entirely different domains, such as astronomical, geographical, oceanographical, meteorological and ornithological knowledge.[11] Stars provide the bearing, waves and winds an indication of the speed of the voyage, while birds as well as water currents and the color of the water help to identify the vicinity of land.

Yet, such local knowledge consists of more than a collection of isolated pieces of information compiled according to specific needs, or it could hardly meet the challenges and vicissitudes of long-distance seafaring. Rather, it must have some of the same properties as the corresponding Western scientific and technological knowledge, namely predictive power even when only incomplete information is available, flexibility, coherence and transferability from one generation to the next. It turns out that traditional Micronesian knowledge about navigation has a rather sophisticated cognitive architecture that can be described in terms of men-

[8] An example is the emergence of globalized mathematical knowledge from local accounting techniques in Babylonia by an iteration of representation and reflection. See chapter 6.

[9] This point is stressed as "border thinking" by Walter Mignolo (2000). Mignolo relies largely on the work of Edouard Glissant (1993). Glissant himself underlines the interconnectivity of knowledge, people and cultures in colonial and post-colonial times which he describes as a *creolization* of knowledge. A global situation in which such *creolization* prevails is described as "mondialité" or globality.

[10] See (Gladwin 1970; Hutchins 1983, 1995), see also chapter 19.

[11] See, for example, (Sahlins 1981).

tal models that allow the "calculation," albeit in an analog way, of the course of a boat on a long-distance trip.[12] One such mental model allows, for instance, the progress of a voyage between two islands to be tracked in terms of one or more "reference" islands. Usually these are not actually visible during the trip. But their imagined relative position to the boat is mentally projected onto a horizon that is conceptualized as a straight line representing the entire trip. In this way, whatever happens to the boat on the trip, whether it is delayed or off-course, can be reckoned with in terms of the virtual landmarks along this imaginary horizon. The navigator can thus accomplish mental operations that, within the framework of Western knowledge, would have required complex nautical calculations. Yet, while such local knowledge may have the same efficacy as globalized knowledge, it is bound to a specific context as well as to context-specific social relations. Furthermore, it is typically embedded in comprehensive views of the world at large ("cosmologies"). In the case of Micronesian navigation by the stars, it depends, for instance, on the fact that this navigation takes place close to the equator, where stars (and planets) rise and set along paths more or less perpendicular to the horizon. This makes it possible that, in the course of the night, one star can simply take over the role of another, just "underneath" it, to indicate a given bearing. This peculiar circumstance can evidently also be rediscovered and reactivated, even when more sophisticated traditions of local nautical knowledge have perished. In contrast, these more sophisticated traditions, due to the omnipresence of globalized knowledge, stand little chance of being revived, or even undergo their own intrinsic development toward globalized knowledge.

Local knowledge also may become globalized as a consequence of extrinsic developments. A striking example is the transformation of a culturally specific understanding of accountability and moral responsibilities into a globalized standard of development projects imposed by the more powerful Western partners in such cooperations. The assumption, for instance, that developmental aid directed at improving water supply should establish waterworks as economically viable, independent units and keep them functioning as essentially self-sufficient enterprises, has become part of a globalized standard for such projects.[13] This standard, however, is hardly supported by any intrinsic development of knowledge about water management in diverse social settings that would necessarily entail this conclusion. Rather, the root of this assumption is a local piece of knowledge, emerging from specific experiences in the economy of Western urban societies, but then extrapolated and imposed, in an extrinsic, politically steered process, onto developing countries. Similarly, the knowledge of how to deal with the HIV/AIDS infection spread by international campaigns in developing countries often includes supposedly globalized standards on how to forge appropriate and "healthy" ways of dealing with the disease, standards that are actually modeled on specific West-

[12] For the concept of mental models, see chapter 1, section 1.3.3.
[13] See chapter 21.

ern ideas of autonomously acting, "empowered" individuals.[14] This spread also constitutes a globalization of local knowledge, anchored in non-universal, Western traditions of conceiving the relation between an individual and the society. Now these culture-specific conceptions are imposed on diverse social environments by the extrinsic dynamics of developmental politics, backed by economic and political globalization.

16.3 The Double Function of Local Knowledge

Local knowledge may be of different kinds. It may serve to constitute social identities by providing reflective resources to assess reality and other kinds of knowledge in the sense of second-order knowledge. But it may also primarily serve to solve problems of human survival, such as food production, communication, healing, building and mobility. Even today, some indigenous populations retain an immensely sophisticated knowledge of their local environment, for example, about local plants used as food and medicine, as raw materials for buildings, as weapons, for making clothes, musical instruments and various kinds of tools, or even in the context of ritual practices.[15] As this knowledge is intimately connected to these specific kinds of uses and not cultivated for its own sake, it may rapidly sink into oblivion once these uses have become obsolete. But local knowledge may also serve to constitute and preserve cultural identity. For the most part, the two functions can hardly be separated from each other, as the elementary example of linguistic knowledge may illustrate, serving both purposes of communication and of constituting cultural identity.[16]

Next to language, religion is a key element in shaping local identity, serving to preserve a group's unity. Typically, religion may also constitute a medium in which identity conflicts are reflected and negotiated, as when the Tupinikim people of Brazil simultaneously follow their own native beliefs and worship the "white man's" God, without seeing any contradiction.[17] Local religious beliefs may also comprise elements of knowledge about the natural world, for instance, about plants and animals, about specific places in the landscape or about astronomical phenomena. The extent to which such religious knowledge is also functional in mastering practical challenges varies greatly from culture to culture, for instance spatial orientation, agricultural rhythms or medical treatments. The intrinsic coupling between such functional local knowledge and its integration into religious beliefs is evidently weak and dependent on specific circumstances.

[14] See chapter 22.

[15] For the case of food, see, for example, (Porter 2006), and also (Nützenadel and Trentmann 2008).

[16] For example, post-colonial literature written in India or abroad in Indian diaspora communities serves to constitute a particular Indian or Indian regional identity by conciously deviating from the dominant English literature. See Kumar (2007) and for the general issue of identity formation by literature, also Anderson (1996).

[17] See, also for the following references to Brazil, chapter 23.

Local knowledge is usually shared knowledge communicated in everyday interactions and practice within a specific community and transmitted from generation to generation. It may, however, either serve to enable individuals to accomplish certain tasks, for instance preparing a certain artifact, or it may become operational only when various individuals combine their shared knowledge in collective actions, in agriculture for instance, or when a group activity is required to erect a major building or monument. This collective dimension may be exemplified by the *mutirão* regime of mutual help among the Guarani in Brazil or by the construction of men's houses among the Eipo people in New Guinea.[18]

Beyond the double function of local knowledge for practical and cultural purposes and beyond its characteristic combination of material and social aspects, it may also take the form of a decidedly second-order epistemic framework. Note, however, that there is no fixed boundary between specific first-order knowledge and reflective second-order knowledge, as is often the case for taboos, which at the same time play a practical and an epistemic role.

16.4 First and Second-Order Knowledge and their Representations

Every human society deals with the generation, transmission and application of knowledge and has accordingly also developed meta-knowledge about these processes. This meta-knowledge may not necessarily become expressed in statements about knowledge but may also be implicitly represented by certain social practices, such as communal or hierarchically organized decision processes, the social organization of learning processes, or the ways in which knowledge is encoded in religious activities. In this way, second-order epistemic frameworks are generated and maintained that regulate the power typically coming with knowledge. Among the Guarani of Brazil, for instance, knowledge is concentrated in the hands of the *Pajé*, the tribe's priest, enabling him to serve as a guide, healer, educator, seer and sorcerer. Such second-order epistemic frameworks hence determine, in particular, who possesses which knowledge, and go a long way in determining the collective identity of a society, evidently shaped by the way it conceives of itself and hence also by meta-knowledge.

First-order local knowledge is internally represented by mental models enabling individuals to master intellectual tasks, such as selecting plants, preparing food or path-finding in a context-dependent way.[19] One example is the mental model underlying Micronesian seafaring discussed above. Accordingly, first-order local knowledge is materially represented by elements of the environment, context-dependent actions, as well as the tools and objects employed in such actions. In the conventional sense, it is thus in many cases "tacit knowledge."[20] It may be socially represented by ritualized forms of communication involving elements of

[18] See (Thiering and Schiefenhövel 2012).
[19] See chapter 1, section 1.3.3 and also (Gentner and Stevens 1983).
[20] For the concept of tacit knowledge, see (Polanyi 1983).

language, such as technical terms, poetry and songs, but also by other forms of ritualized social behavior such as artistic or religious performances and productions. Second-order local knowledge is internally represented by mental models referring to processes of knowledge production, justification and transmission to local social structures and cultural constructs. It may thus be externally represented by social structures, such as the institution of the oracle of Delphi in ancient Greece or that of the above-mentioned *pajé* in Brazil. Second-order local knowledge, however, may also be represented linguistically, for instance by religious or literary tales about knowledge, or simply by linguistically transmitted epistemological common places characteristic of a particular culture. One example discussed in Part 3 is the association between historical development, including that of knowledge, and seasonal growth and change common in Chinese culture.[21]

Historically transmitted second-order frameworks are typically less affected by changes of technology, environment or new information than is first-order knowledge, being more removed from immediate experiences. First-order knowledge tends to lose its relevance when contexts change. Its preservation is also endangered when external representations on which its transmission relies disappear, as when a native language is extinguished or when the corresponding material culture—for instance, the production and use of canoes in Micronesia—vanishes. Second-order knowledge, in contrast, is more durable not only because its relevance for intellectually mastering the world is less dependent on specific contexts, but also because its external representations are more resistant to changes. Epistemological common places as well as relevant tales, for instance, may be transmitted across linguistic and cultural barriers. Thus second-order local knowledge has in general proven to be more resistant to the challenges of globalization than first-order local knowledge. Local social structures such as family, ethnic groups and religious affiliations play a role in the regulation of the production, authorization and transmission of knowledge and may survive and even spread, when other, more large-scale social structures, such as political institutions, have long become victims of globalization.

Thus for instance, even when first-order knowledge about HIV/AIDS infection becomes widely available in a country due to governmental and non-governmental campaigns, the behavior of local people toward the disease remains largely governed by traditional second-order knowledge shaped, for example, by the dynamics and conflicts of family and clan relationships—and even by mentally assimilating the disease to witchcraft and disorders supposedly caused by the non-observance of ritual prescriptions.[22] At the same time, new forms of second-order knowledge may emerge from new types of situations, such as encounters between international development experts and local practitioners.[23] Such encounters require and generate a specific form of meta-knowledge, making it possible to move back and

[21] See chapter 17.
[22] See chapter 22.
[23] See chapter 21.

forth between local and globalized knowledge. Such newly emerging local second-order knowledge, however, is itself conditioned by the global history of knowledge and in particular by the demise of colonialism, which would have left little room and no legitimacy for such switching back and forth between different epistemic perspectives, one globalized, the other local. Still, the articulation of these perspectives and of the results of their encounter remains mostly local and implicit so that its overall impact on development policies is limited.

16.5 Modernization Without Alternatives?

With regard to the space available for negotiation between global and local knowledge, the situation looked entirely different at the beginning of the twentieth century. All over the world, social and intellectual elites were attracted by the apparent superiority of the Western trajectory into the modern world or were directly recruited in its service. The globalization of knowledge about modernization and its opportunities, in which these elites took part, anticipated other globalization processes. They thus contributed to a generally expected alignment of traditional societies with the Western paradigm. Alternative pathways involving what had remained of the world's variety of local knowledge traditions were being increasingly obliterated. In short, at the beginning of the twentieth century, the place of local knowledge seemed to be confined to niches soon to be eradicated by the expansion of Western economic, political and epistemic power. The gradual repression of local knowledge corresponded to the disempowerment and pauperization of the majority of people outside Western countries. In large parts of Latin America, for instance, land taken away from indigenous peoples by the privileged classes severely undermined their living conditions. In Africa, the natives were exploited as cheap labor, if not as slaves and cannon fodder in colonial wars. In Asia, even where local people were able to keep their governmental rule as in China, or at least local administrative structures as in India, they nevertheless became second-class citizens in their own countries.

While local populations still relied in part on traditional knowledge for their subsistence, at the same time they were affected by modernization processes such as urbanization, monocultural farming, large-scale cattle breeding, the industrial exploitation of primary resources, militarization or colonial warfare, inducing the loss of traditional knowledge. In many instances, local resources were drained further by the spread of epidemic diseases which reduced the size of human as well as animal populations and weakened their resistance to newly expanding economies and political regimes. As a result, people became increasingly dependent on a globalized economy which in contrast to their traditional ways of subsistence, did not offer them sustainable living conditions, unless they belonged to those elites who profited from such partial modernization processes. At the same time, however, with the diffusion of Western influence, water management, public health and education became societal issues—in some regions for the first time—which

contributed to improved living conditions, for at least some of the population. Missionary activities, mass media and the education of at least a small part of the indigenous population enhanced the globalization of scientific and technological knowledge.

In all, these processes led to a sharpening of social contrasts and to a disintegration of societies, which were deprived of their potential to develop autonomous responses to the challenges of political and economic globalization by drawing on their own local knowledge traditions. The abdication of local elites, who pursued only their self-interests and their exploitation rather than leading the local population, contributed to this loss.[24] As the example of the self-colonization of Chinese intellectuals at the beginning of the twentieth century illustrates, under the conditions of global colonialism, even local perspectives on the possibilities of emancipation were likely to be determined by the sole legitimacy of Western second-order knowledge about the progress of science and its coupling to the progress of society.[25] Self-colonization is understood here as a process in which local actors identify with global epistemic frameworks fostered by dominant political and economic powers to empower themselves as well as their developing country by replacing local with globalized knowledge.[26]

Yet, without residual traditions, without the creative appropriation of globalized knowledge, and without new local responses to these challenges—including the adaption of new foods to traditional eating habits or the recycling of waste—for many survival would have been impossible. At the same time, local religious traditions, traditional social structures like family and clan relations, and other important factors shaping second-order local knowledge such as locally shared views about the role of an individual in society, or about gender and racial issues persisted. Occasionally, such traditional social structures assumed new meanings and new significance due to new circumstances, for instance with the potential of new military technology or new economic contexts to boost traditional rivalries into wars of extermination. But at the beginning of the twentieth century, the overall importance of second-order local knowledge remained confined, or so it seemed, to local and regional domains, without any chance of becoming relevant on a par with the globalized Western paradigm of progress and modernization.

16.6 The Unexploited Potential of Local Knowledge in a Post-Colonial World

This situation changed only when Western political, military and economic competition escalated into the world wars of the twentieth century, which substantially weakened Western political and military hegemony and opened up spaces

[24]This is explicitly reflected, for instance, in the autobiography of Mahatma Gandhi (1948).
[25]See chapter 17.
[26]This is also discussed by Albert Memmi (1967) who refers to the apparent inutility of the local or vernacular languages of colonized people who see all advantages in the language of the colonizer.

for the global spread of and experimentation with a variety of models for societal development, such as nationalism, militarism, socialism, democracy or religious fundamentalism, mostly still rooted in traditions of modern Western thought.[27] By the end of the 1960s, most of the former European colonies in Africa and Asia had become independent. The young states emerging from former colonies, however, were shaped by their historical heritage in ways that hardly any of these models were capable of coping with. Having served as suppliers of natural riches to industrialized countries, the economies of new nation states were one-sided, characterized by monocultures and highly dependent on the price fluctuations of the world market. Typically confined by artificially drawn boundaries, these states were further characterized by ethnic conflicts, often enhanced by colonial privileges for specific parts of the population, by diverging social differences and by the general lack of infrastructure for medical care and education. In addition, they continued to be dependent on industrialized countries, which did not hesitate to intervene when their own economic and political interests were concerned, even with military force. Examples are the military interventions of Japan in China, of France in sub-saharan Africa and those of the United States in Latin America.

Against this background, models of modernization with European origins were being reinterpreted and in part reinvented. Thus socialist ideas, which originally spread in Europe in response to the devastating social consequences of capitalist industrialization, had become, through their adaptation in Russian Bolshevism, part of a globalized ideological framework fostering the transformation of traditional societies. After World War II, they turned into an important point of reference for shaping the newly gained autonomy of post-colonial states. Such transformations were often still forms of transplanting versions of Western modernization top-down and often by brutal force into non-Western countries. In contrast to colonialism, however, the spread of such models of modernization was driven at least in part by a globalization of knowledge, in particular, about the political and economic options of developing countries to respond to the external pressure of industrialized nations and of the world market. Moreover, these models were often adapted to local circumstances, giving rise to autonomous solutions of developmental problems. These localized models were connected with high hopes for young nations to become independent actors in a globalizing world. Socialism in Tanzania, for example, centered on localized ideas about self-reliance, communal living and the African family. In most cases, however, such original solutions did not turn out to be sustainable due to external pressures.[28] In fact, the spread of alternative models of modernization was more often than not instrumentalized as a vehicle

[27] For a general discussion, see also (Eisenstadt 2000, 2002; Diawara 2004; Randeria and Eckert 2009).

[28] See the famous text by Frantz Fanon, first published in 1958, in which he deals with the post- or rather neo-colonial situation of African people between the blocs of the Cold War. He expresses quite a global view: "The future of every man today has a relation of close dependency on the rest of the universe. That is why the colonial peoples must redouble their vigilance and their vigour" (Fanon 1970, 136).

of neo-colonialism and global imperialism, particularly during the period of the Cold War. Under these circumstances, the affiliation of a particular country with the Western or Eastern alliance or its relevance as a provider of primary resources were generally more relevant to its eligibility for foreign support or its exposition to military interventions than its actual capability of improving the living conditions of the population according to a particular model, be it socialist or Western democratic. The immunization of models of modernization against modifications due to local knowledge is evidently furthered by the role of these models to defend claims to power in a post-colonial world, from the ideological confrontations of the Cold War to the War against Terrorism in our times.

Under these external pressures, the capability of such models to integrate local knowledge into a global learning experience remained limited. This was due in part to the immense inequality of power relations between developing and developed countries, but in part also to the inflexibility of Western thinking which hindered productive reactions to experimental variations of developmental models. As a result, experiences with the success and failure of the implementation of different models of modernization, in particular during the period of the Cold War, were often accumulated only on the level of ideological debate, without taking into account potential modifications induced by local knowledge. There were, however, remarkable exceptions, even in the contentious economic domain. In 1944, the Bretton Woods Conference, under US and British leadership, established rules for international economic policies, reversing the pre-war emphasis on protectionism and fostering the expansion of international trade. State interventionism according to the Keynesian model was an essential part of the Bretton Woods system, dominating international economic policies until the beginning of the neoliberal era in the early 1970s. The International Monetary Fund (IMF), the World Bank and the World Trade Organization (WTO) were all founded in its wake. On closer inspection, however, it did not amount to spreading a universal paradigm that was then identically reproduced, but left room for experimentation, adaptation and cooperative learning among different countries. As the example of the rapid spread of the central banking system, a key element of the Keynesian model of state interventionism, shows, local experiences and their exchange, in particular among developing countries, could play a key role in the transformation of this model.[29]

In the long term, local knowledge as well as other locally diverse conditions has played a crucial role in the differential development of non-Western countries since the 1970s. Practically all expectations concerning generic patterns of development were ultimately disappointed. Socialist models did not work as conduits toward a more equal distribution of wealth, either internally or with industrialized nations, nor did protectionism, and a reorientation from the world market toward South-South collaborations necessarily lead to an autonomous modernization of developing countries. And neoliberalism, with its request to deregulate local

[29] See chapter 20.

economies and open them toward the world market, did not bring such countries into alignment with the industrialized part of the world. Yet, substantial economic development in the so-called Third World did take place and was spurred by diverse conditions, from exploiting the local control over oil as a global key resource by Arab feudal regimes to the reorientation of local economies toward global exports by the "Asian Tiger" states.

Since the 1980s, a general trend can be observed for disseminating democracy, for strengthening the role of religion and for the spread of infectious diseases. Parallel to the dissolution of the Eastern bloc, authoritarian regimes were increasingly substituted by democratic ones in Latin America, in Africa and in Asia. These developments reflect the dependency of the success of a particular trajectory on specific local conditions, including its historical roots, as well as the capability of entire countries to learn not only from their own historical experience, for instance about the failure of authoritarian regimes to cope with the economic crisis, but also from those of others. In fact, the rapid economic development of certain Asian countries in recent decades could have hardly happened without the existence of ancient local traditions of cultivating knowledge as a way of self-improvement, such as Confucianism, nor without some countries (Hong Kong, Taiwan, Singapore and South Korea) serving as models for others (Indonesia, Malaysia and Thailand) (Dirlik 1995; Kim 2000). In contrast, Pentecostalism gained a stronger foothold in Latin American countries, as did Islam in Central Asia (Martin 1990). The 1980s and 1990s were further characterized by the increasingly global significance of infectious diseases such as AIDS or tuberculosis (Kaufmann 2009).

Global experiences nevertheless continued to play a limited role in guiding national and international policies. Indeed, the prevailing global structures fostering economic and infrastructural development still made insufficient use of experiences with differential local developments.[30] Development policy essentially began in the 1960s after the demise of colonialism on a global scale. Planned humanitarian interventions, characteristic of today's development policies, are embedded in dominant globalized organizational frameworks, imposing second-order frameworks on joint projects involving foreign experts and local actors. The experts are part of an international community consisting of engineers, agronomists, medical specialists, economists, lawyers and social scientists, engaged in pilot projects and humanitarian interventions. They have developed a highly specialized corpus of knowledge shaped by experiences with specific infrastructural challenges and global policies of development. This knowledge, as a rule, is put into operation under a logic of local technological or infrastructural success as measured by globalized standards within globalized epistemic frameworks. Actual success, however, is largely governed by factors outside their control, such as local political, economic and cultural conditions.

The first-order technological and scientific knowledge brought by the development experts is unavoidably reinterpreted and altered as a result of the encounter

[30] See chapters 21 and 22.

with local knowledge, including the second-order local knowledge about how such practical knowledge is to be implemented. Second-order local knowledge, and in particular the newly emerging second-order knowledge molded by the encounter between local and globalized knowledge, is universally effective in modulating the spread, appropriation and further development of knowledge. Nevertheless, what typically happens in such situations of epistemic heterogeneity conditioned by political and economic inequality is that this newly emerging local second-order knowledge is hardly articulated: instead, the procedural component is emphasized, that is, knowledge is generated and implemented about how to keep conflicts under control, by administrative measures, by bracketing or suppressing problems, or by brute force against some of the problem solvers. As a consequence, the newly emerging local knowledge about how to manage the practical challenges of waterworks, medical care or school education often barely feeds back into globalized epistemic frameworks, other than in an ad hoc manner. For the most part, it remains tacit knowledge. In this way, the significant transformative ability of local knowledge, which is often highly contested and subject to modifiation, remains unexploited.

16.7 The Generative Ambiguity of External Representations

The question of how to articulate knowledge brings us back to the issue of its external representations. External representations of knowledge, as a rule, have no uniquely fixed relation to internal, mental representations. Apart from the general ambiguity of say, language, two particular aspects are of interest in our context, both pertaining to what one may call the generative ambiguities of external representations: when individual knowledge is built up from shared external representations in the process of appropriation, ambiguities and individual variations emerge, giving rise to both misconceptions and innovations. External representations of knowledge often serve to express knowledge of quite different layers of reflexivity, as when, for instance, the equation $5 + 7 = 12$ is used as an example of arithmetic, of number theory, or of the synthetic a priori in the sense of Kant's philosophy. In using external representations for communication, in particular in cross-cultural contexts, this creates an inherent uncertainty about which layers of reflexivity are involved. Clearly, this particular ambiguity of external representations is a trace of their original role in generating such different layers of reflection in the first place, as there clearly would be no number theory or Kantian epistemology without the external representations of arithmetic historically preceding them.[31]

This generative feature of external representations may be enhanced when they are employed in the encounter between local and globalized knowledge. Here they typically serve as borderline objects to which different systems of knowledge are applied, thus connecting them, typically with repercussions on both sys-

[31] See chapter 6 and (Damerow 1996, 379).

tems involved.[32] External representations of globalized knowledge, such as books, databases or medical prescriptions, are used to reconstruct the knowledge transmitted from the perspective of a local culture. In this process of appropriation, such knowledge is reconceptualized in ways that strongly depend on second-order local knowledge and may even be shaped by first-order local knowledge, as when a compass is integrated into a system of navigation based on local astronomical and geographical knowledge.[33] The reconceptualization of globalized technological and scientific knowledge within the local setting of a developing country may entail entirely different social and behavioral implications of such knowledge in comparison to those associated with it under the assumption of "rational" and "autonomous" individuals employing such knowledge. As we discussed above, the transmission of basic knowledge, for instance, about HIV infection and about what the risks of certain behavior are, does not necessarily lead to appropriate changes in behavior helping to contain such risks. Local second-order knowledge may simply not offer any mechanisms by which new first-order knowledge can lead to such behavioral changes, at least on a collective level.

Such changes may rather be induced if second-order local knowledge changes as well, as when for instance new social communities emerge, and with them new role models and new identities for individuals, allowing them to assimilate such new knowledge in a more consequential way.[34] In this way, social structures, as we discussed above, serve not only as external representations of local second-order knowledge but also as conduits (or hindrances) for the assimilation of first-order globalized knowledge. It is for this reason that more recent developmental policies have drawn the conclusion that the transmission of such first-order globalized knowledge may make effective use of new role models and new identities for individuals, such as that of the "self-empowered" individual or of the individual "living positively" with the disease. Now these role models are also supposed to serve as conduits and external representations of the globalized first-order knowledge about HIV infection and associated behavioral risks. As a matter of fact, however, the efficacy of endogenous social representations and embodiments of local second-order knowledge can hardly be matched by such externally imposed role models, unless they happen to resonate with already existing social structures, such as those of more globalized urban environments.

When external representations act as borderline objects under conditions of epistemic heterogeneity, their generative properties may be enhanced, as mentioned above, possibly inducing new forms of local knowledge. An example are local objects, be they natural, artisanal or artistic, that make sense both from the perspective of local culture and from that of globalized knowledge, embodying, for instance, abstract mathematical structures. In this way, they may open up new ways of appropriating such globalized knowledge, and at the same time connect

[32] See chapter 21.
[33] See chapter 19.
[34] See chapter 22.

it with specific local experiences at both the first, and second-order level. Thus Guarani children in Brazil may learn the mathematical concept of symmetry on the basis of the indigenous practices of basket-weaving and body painting, and at the same time experience, so to speak on the second-order level, the possibility of connecting local and globalized knowledge.[35]

Alternatively, under conditions of epistemic heterogeneity, external representations may enhance the formal, material and procedural aspects of knowledge and knowledge transmission. This typically happens when cooperation is enforced under extrinsic or intrinsic pressures, emerging from the necessity, for instance, to complete a local development project funded by international sources. In this case, accountability is enforced as a globalized second-order epistemic framework embodied in external representations, such as lists, standard forms, time-sheets, workflows and databases. Yet at the same time, even such external representations of formal knowledge display the characteristic generative ambiguities mentioned above. Due to their role as borderline objects, mediating between local and globalized knowledge, they are amenable to alternative interpretations depending on different contexts of justification, for instance within and outside specific negotiations. They thus enable the development of the previously mentioned meta-knowledge making it possible for development experts to move back and forth between local and globalized knowledge. As long as such meta-knowledge does not itself find an external representation beyond these ambiguities it must remain entirely ad hoc, thus constituting merely practical, local second-order knowledge. In other words, the globalization of such second-order knowledge also depends on the emergence of more encompassing forms of external representations, involving not just procedural aspects, but also first-order local knowledge as well as reflections on the concrete social experience of the cooperation itself. In view of this latter component, more encompassing external representations of this kind will probably have to take the form not only of written accounts or formal procedures, but also that of new forms of social organization suitable to contain and transport the second-order knowledge acquired in such experiences. These experiences could enter, for instance, into the curricula of school and university teaching, offering novel perspectives on the possibilities of contextualizing scientific and technological knowledge.[36]

16.8 The Four Phases of Knowledge Transmission

In the following, we consider the encounter between globalized and local knowledge from yet another point of view: the overall dynamics of knowledge transmission. This perspective confirms what we have learned from examining the role of external representations in such encounters, namely the existence of an inherent potential in these processes for enhancing the autonomy of its participants.

[35] See chapter 23.
[36] See chapter 25.

Knowledge transmission processes may be triggered by the spread of innovations due to commerce, war, religious missions or chance encounters. Examples are the assimilation of new eating or clothing habits by Brazilian native populations, or the arrival of new boat technology in Micronesia.[37] They may be intentionally imposed on a local culture from the outside for political, economical or ideological reasons. Examples of this are the transfer of water management infrastructure or medical procedures by development projects to under-resourced African settings.[38] But knowledge transmission processes also may be engendered by factions of a local population, as when Chinese elites began, at the beginning of the twentieth century, to search for ways of emulating the Western trajectory toward modernity and constructing communicative networks to serve as conduits for the transmission of globalized knowledge.[39]

In all of these cases, the transmission of globalized knowledge into cultural settings shaped by local knowledge proceeds as a multilayered process within a global interaction sphere, with different kinds of transformations happening more or less simultaneously in the different layers. But knowledge transmission is layered not only in a synchronic but also in a diachronic way, as earlier globalization processes may significantly condition later encounters between globalized and local knowledge. For instance, local languages may or may not have been lost, a circumstance that significantly changes the conditions for preserving local knowledge, as the different examples of the Tupinikim and the Guarani populations in Brazil illustrate.[40] Moreover, one such historical differentiation also engenders, as a rule, a divergence of other sociocultural traits in subsequent development. Earlier historical events may have led, in particular, to quite diverse learning (or suffering) experiences in dealing with the encounter between local and globalized knowledge.

The encounter between globalized and local knowledge encompasses four analytically, not temporally, distinct phases. First, the global interaction sphere determines the conditions for any kind of transmission processes, including the accessibility and transfer of globalized knowledge. Such transfer often begins with rather mediated, indirect and unintentional activities, as when industrial products arrive more or less accidentally in a context where they have been previously unknown. Gradually the transfer then becomes more immediate, more direct and more intentional, as when such products are directly acquired or even reproduced in a local context. Second, globalized knowledge is localized, that is, recontextualized, selected, appropriated, transformed and institutionalized according to the locally dominant epistemic constellation. This happens, for instance, when technical equipment is re-engineered or set into a new social context to serve local purposes. Third, knowledge is transformed, that is, obliterated or modified by

[37] See chapter 19.
[38] See chapters 21 and 22.
[39] See chapter 17.
[40] See chapter 23.

the contact with globalized knowledge or else superimposed on it, with first-order local knowledge often being extinguished or strongly modified, and second-order local knowledge often being somehow blended with globalized second-order knowledge. Thus, local knowledge about health may change as a result of contact with globalized knowledge, by dismissing local healing practices while merging the local understanding of the social context of health with globalized standards of healthy behavior, for instance, in terms of sexual relationships or family ties. Fourth, genuinely new knowledge about the material or the social world may arise as a result of the encounter between local and globalized knowledge, as when new pharmaceutical products become possible on the basis of integrating indigenous knowledge about plants into globalized biochemical knowledge, or when new forms of social interaction are developed from experiences gained with knowledge transfer.

As a result of the multilayered structure of the transmission of globalized knowledge into local settings, the global availability of technologies and technological products does not necessarily imply the spread of globalized knowledge systems. Both global and local conditions may even totally block this spread, as when Japan isolated itself from foreign influences over centuries. In general, however, transmission processes are not prevented but merely lead to unexpected outcomes. Thus, the spread of the outboard motor on boats as a convenient substitute for more traditional techniques of locomotion, as one might have expected, does not entail the spread of globalized navigation techniques.[41] And the spread of a globalized technological infrastructure, of medical treatments, or of mass media does not necessarily go along with the same kind of changes in social structure and in the corresponding social knowledge that accompanied the original establishment of these achievements in technologically advanced societies. Yet, the transfer of technologies and technological products is associated not only with technical and scientific knowledge, but also with certain models of rationality as well as with cultural and social knowledge, in particular about the possible goals and values of the use of such technology. This added-on component of transferred globalized knowledge is due in part to the internal logic of technological systems which only work as intended in specific social contexts, and in part to the global conditions of transfer imposed by the more powerful side of the interaction sphere.

This "inscription" of globalized norms and values into technology transfer may even appear to be a largely deterministic process, leaving little room for the receiving end to creatively appropriate and transform the results of the transfer according to local norms and values.[42] Such a view, however, would underestimate the complexity of a knowledge transfer process and its inherent potential for enhancing the autonomy of its participants. When technology serves as an external representation of knowledge in such transfer processes, it intrinsically develops, as we have discussed above, generative properties, opening up a larger horizon of possible uses than that originally envisaged by its manufacturers. Furthermore,

[41] See chapter 19.

[42] See, also for the following, the discussion in chapter 21.

an epistemic vacuum does not exist. Globalized knowledge is always matched with local knowledge, and this encounter typically triggers transformation processes with novel consequences, occasionally at the level of first-order knowledge and virtually always at the level of second-order knowledge about the reflexive self, about role models in society and about the meaning of knowledge. This is so because when actions must take place, for instance in cooperative ventures under conditions of epistemic heterogeneity, then they must also be accompanied by reflections lending them meaning. These reflections necessarily combine local and globalized knowledge; they affect the understanding of norms and values, but they typically do not yield results fitting into the pre-existing local or globalized systems of knowledge. As we have also discussed, they hence tend to be of a merely ephemeral character, being expressed in terms of a meta code articulated outside the established systems of representation and merely in local contexts. The spontaneous development of such meta codes nevertheless harbors the potential for more encompassing reflection, and accordingly for a more conscious steering of knowledge transfer processes in which the norms and values that seem to be inextricably linked to and "inscribed" into technology can actually be spelled out and thus debunked.

16.9 The Global Context of Encounters Between Local and Global Knowledge

When considering the opportunities to develop such local experiences into more general perspectives, one should not forget the global conditions for implementing them in concrete policies. Otherwise one risks mystifying the epistemologocal complexities of these experiences as they are revealed in studies focusing on specific local settings, and overlooking their dependence on the larger historical development which may affect the interaction between local and global knowledge in fundamental ways.

The dynamics of the world market, and in particular of the world financial market, radically affects the field of policy options in ways that may counteract any perspective for sustainable development (Mosley 2003). Until the beginning of the 1970s, exchange rates had been pegged to the US dollar (and the dollar fixed to gold). In addition, to maintain the pegged exchange rates, most countries used capital controls. This arrangement isolated developing countries from international financial markets and enabled them to borrow money and maintain a current account deficit without the risk of "speculative attacks." The problem with this arrangement was that the United States served as a global source of liquidity. The situation led to a growing current account deficit in the United States, which financed the trade surplus of Germany and Japan. By 1971, US gold coverage had fallen dramatically and within a short period of time the international monetary system shifted from pegged (but adjustable) exchange rates to floating exchange rates. This change was accompanied by many countries lifting capital controls

(Eichengreen 1996). The new international monetary regime put growing pressure on developing countries because they were no longer isolated from international capital flows (Fischer and Reisen 1993). In addition, with the liberalization of financial markets, developing countries had to compete for Foreign Direct Investment (FDI) by providing more favorable conditions for foreign capital, a process that at least in some cases led to a "race to the bottom" (Froot 1993; Jensen 2006). The new international situation required developing countries to undergo fargoing structural adjustments, a process that was accompanied by financial and economic crises.

Also, when credits were cheap in the 1970s due to an excess supply of capital on the international financial market, many developing countries made use of this opportunity to launch overambitious projects for creating infrastructure and building up industry that could not be maintained from their own economic momentum. In the 1970s, developing countries were also struggling with the consequences of the international oil crisis and the global economic recession. In addition, in the 1980s, interest rates were going up and capital wandered to the United States, as a consequence of its neoliberal politics with tax reductions and increased military expenses financed by credit. Many developing countries were thus unable to pay their debts. Eastern and Southern African countries, for instance, stood on the verge of economic and political collapse.[43]

As a consequence, poor countries now became even more dependent on support and interventions by the West, for instance in the form of financial aid by the IMF and the World Bank, institutions dominated by rich countries. Such aid aimed at macroeconomic stabilization and at paying off national debts. At the same time, it has become more customary that Western donor countries connect developmental aid with requests for human rights, limitation of military budgets, the fight against corruption and for democratization, in particular since the collapse of the Eastern bloc. In any case, since the mid-1980s, developmental policy has been increasingly geared to structural adjustment programs, ensuring the economic viability of aid projects, again as measured by globalized standards.[44] Such globalized standards for development and structural reforms typically comprise requests for currency devaluation, deregulation, and the reduction of trade barriers, privatization of state-owned enterprises, reduction of public spending for healthcare, education and housing programs, and requirements of accountability. In Tanzania, for instance, such policies led to a growing deterioration of the public health care system, imposed unbearable costs for medical care on the poorest strata of population, and made the country's health care system increasingly dependent on external funding.[45]

[43]See (Anders and Münter-Elfner 1999; Nitsch 1999), see also (Strange 1997, Table 1.2, 17) and http://www.ritholtz.com/blog/2010/08/history-of-us-interest-rates-1790-present.
[44]See (Goldstein 2001; Drazen 2002; Khan and Sharma 2003; Vreeland 2003; Akonor 2006).
[45]See (Collier 2007; Easterly 2006; Anderson 1999) and chapters 21 and 22 in this volume.

The reform programs introduced by the IMF and the World Bank in the 1980s thus imposed the priorities of international donors and development experts on national and local governing bodies, ignoring domestic differences.[46] At about the same time, however, development experts became increasingly aware of the necessity to also integrate local knowledge and expertise into the planning, organization and implementation of local development programs and projects. They realized that the modernization paradigm of development from the 1950s and 1960s, which focused essentially on economic development, had often failed due to its neglect of social and cultural factors and contexts. Nevertheless, holistic models tailor-made for individual countries had and still have hardly a chance of being implemented with the help of international developmental policies governed by globalized priorities and standards. Such models would take into account the entire complex of historical, cultural and social conditions of the given country, as well as local knowledge, for instance, about social cohesion, natural resources and the environment. They would also include the lessons since learned about the entanglement between the transfer of technical and scientific knowledge and changes in worldviews and social organization, for instance concerning the relation between the spread of biomedical knowledge and the modification of local views and cultural practices.

Still there are numerous initiatives worldwide that are guided by the idea of reconciling local cultures and identities with the non-native knowledge that is necessary to live together in a more global society.[47] Such projects—which may be of an educational nature but also take the form of internationally mediated political negotiations about local conflicts—renounce the imposition of supposedly universal standards, methods and values and contribute instead to a globalization of knowledge in the sense of spreading the competence to contextualize globalized knowledge by integrating local experiences and circumstances.[48] A wider spread of such endeavors might go a long way toward strengthening the capability of developing countries to find their own path into a globalized world, in particular when they also include higher forms of learning and new curricula that take into account the ideas of a "global contextualism."[49]

16.10 The Role of Local Knowledge as a Matrix of Globalization

In the end, individual modifications of second-order frameworks, resulting from and in turn shaping the interaction between globalized and local knowledge in practical experiences "on the ground," create the unpredictable patterns according to which the globalization of knowledge unfolds. Thus, in spite of the influence

[46] See (Goldstein 2001) and for a more general criticism of globalization (Rodrik 1998).
[47] See (Morin 2001; Hessel and Morin 2012).
[48] See chapter 23; for an example, see also the initiative "Heidelberg Darfur Dialogue" by Rüdiger Wolfrum (Mayer 2005; Wolfrum 2010).
[49] See chapter 25.

of self-colonization on Chinese intellectual elites, modernization in China eventually followed a trajectory that was essentially shaped by modifying globalized ideas about modernization according to specific local traditions and experiences. (This, however, did not prevent tremendous human sacrifices.) Even unpredictable and sometime serendipitous contributions by individuals can make a huge difference to the globalization of knowledge.[50] In the Chinese case, the supposedly stringent and universal intrinsic logic of the Western example, prescribing specific couplings between economic and political developments—for instance between the introduction of a market economy and that of a democratic society—was invalidated, albeit not completely. The same mechanism of partial disintegration and remodeling can be observed on all scales. For instance, the introduction to Micronesian seafaring of modern boat technology—associated in a globalized context with equally modern navigation techniques—does not necessarily preclude the revival of navigational knowledge strongly bound to the local context, although it does entail the loss of traditional sailing techniques.[51] Similarly, the technological improvement of waterworks in Tanzanian cities in the course of developmental aid is not necessarily accompanied by a successful transfer of the organizational structure required to run these waterworks according to globalized standards.[52] Yet the failure of this transfer ultimately led to follow-up projects dealing with precisely this issue, albeit in a way not fully determined by these globalized standards. Similarly, the transfer to local African communities of globalized knowledge about causes of HIV infection and measures to prevent it does not necessarily lead to changes in social behavior that correspond to the expectations originally associated with this transfer.[53] Yet obviously, the transfer of such primary knowledge is always coupled with an interaction between second-order frameworks. This interaction also ultimately shapes the result of the encounter between globalized and local knowledge, for instance, by giving rise to new, locally emerging forms of social behavior responding to the challenge of the disease, and both the knowledge and technologies for coping with it. The partial disintegration and remodeling of globalized epistemic frameworks in the course of such encounters between local and global knowledge may act as a source of innovation in comprehensive globalization processes, including their political and economic dimensions.

The place of local knowledge in the global community is not a niche but a matrix, a substratum of all other forms of knowledge generating diversification and change. With the evanescence of local ways to master practical challenges, driven by economic and cultural globalization processes as well as by the inexorable spread of globalized technological and scientific knowledge in their wake, local knowledge may appear to be generally on the decline. There is no spread of knowledge, however, without inevitably local efforts to make sense of it. Cer-

[50] See chapters 17, 18 and 26.
[51] See chapter 19.
[52] See chapter 21.
[53] See chapter 22.

tainly, these local efforts are themselves shaped by the globalization of knowledge, including globally diffused second-order frameworks determining how knowledge is to be gained, understood and used. But these globalized frameworks are themselves deeply influenced by local second-order knowledge, which is less evanescent than first-order local knowledge. It is indeed much easier to interlace—or undermine—these globalized second-order frameworks with local ideas and behavioral patterns channeling the ways in which knowledge is being authorized, appropriated and adapted than it is to preserve local knowledge about traditional technologies.

Globalized second-order frameworks only appear to be dominant as long as one focuses on the level of explicit articulation. Their actual dominance in terms of mastering real-life challenges is another matter. Here, it is typically a mixture of globalized and local frameworks that governs the actual processing of knowledge. In other words, local knowledge is still significant, albeit implicit, in traditional social structures, requirements effectively imposed by ecological conditions, by historical contingencies, or by the locally variable conditions resulting from economic globalization. Such local knowledge has less to do with orientation in the forest or with the manufacture of tools, and more with coping with the incidents of life under conditions that are simultaneously local and global. This hybrid second-order knowledge provides a framework in which other kinds of knowledge, be they local or global, make sense. Such knowledge is always in flux, as are the identities and role models with which it is associated. It is rarely articulated in a direct way but rather tends to hide behind more conventional forms of external representations. Technological artifacts, construction manuals, databases, religious or scientific texts may all harbor such knowledge which is activated when such external representations serve as borderline objects under the conditions of epistemic heterogeneity. Accordingly, hybrid second-order knowledge typically presents itself differently from the perspective of different actors. Yet it is more than the meta-competence of code-switching that allows the actors to simultaneously participate in diverse systems of knowledge. As second-order knowledge is never completely decoupled from first-order experiences with the material and social reality, it also represents a form of knowledge about the real world.

Local knowledge hence remains the underground from which all other forms of knowledge emerge, not in a primordial sense, but in terms of the inevitably local appropriation of shared knowledge, whether it is globalized or not. The immense variability of local conditions hence continues to act as a driving force for the further diversification of knowledge, even in the presence of globalization. The impact of this diversification on the globalization of knowledge, however, remains limited. This situation will prevail as long as hardly any forms of external representation are employed that would allow this multiform knowledge to be reflected upon, conceiving it as a collective human experience, available for shaping the globalization of knowledge with an increasing awareness of its conditions and consequences.

References

Akonor, K. (2006). *Africa and IMF Conditionality: The Unevenness of Compliance, 1983–2000*. Hoboken: CRC Press.

Anagnostou, S. (2000). *Jesuiten in Spanisch-Amerika als Übermittler von heilkundlichem Wissen*, Volume 78 of *Quellen und Studien zur Geschichte der Pharmazie*. Stuttgart: Wissenschaftliche Verlagsgesellschaft.

Anders, S.-W. and M. Münter-Elfner (Eds.) (1999). *Die Weltgeschichte: Eine Welt - und doch geteilt*, Volume 6 Die Weltgeschichte of *Brockhaus Die Bibliothek*. Leipzig: Brockhaus.

Anderson, B. (1996). *Imagined Communities. Reflections on the Origin and Spread of Nationalism*. London: Verso.

Anderson, M. B. (1999). *Do No Harm: How Aid Can Support Peace – Or War*. Boulder, Colo.: Rienner.

Beasley, W. G. (2001). *Collected Writings of W.G. Beasley*. Tokyo: Edition Synapse.

Bushnell, O. A. (1993). *The Gifts of Civilization: Germs and Genocide in Hawai'i*. Honolulu: University of Hawai'i Press.

Cardoso, F. H. (1977). The Consumption of Dependency Theory in the United States. *Latin American Research Review 12*(3), 7–24.

Collier, P. (2007). *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It*. Oxford: Oxford University Press.

Conrad, S. (2004). La constitution de l'histoire japonaise. Histoire comparée, transferts, interactions transnationales. In M. Werner and B. Zimmermann (Eds.), *De la Comparaison à l'Histoire Croisée*, pp. 53–72. Paris: Seuil.

Conrad, S. (2005). Die Zivilisierung des "Selbst". Japans koloniale Moderne. In B. Barth and J. Osterhammel (Eds.), *Zivilisierungsmissionen. Imperiale Weltverbesserung seit dem 18. Jahrhundert*, pp. 245–268. Konstanz: UVK Verlagsgesellschaft.

Conrad, S. (2007). Vergleich, Transfer, transnationale und globalgeschichtliche Perspektiven. Geschichte der Geschichtsschreibung jenseits des Nationalstaates (am japanischen Beispiel). In J. Eckel and T. Etzemüller (Eds.), *Neue Zugänge zur Geschichte der Geschichtswissenschaft*, pp. 230–254. Göttingen: Wallstein.

Cooper, F. (2005). *Colonialism in Question: Theory, Knowledge, History*. Berkeley, CA: University of California Press.

Damerow, P. (1996). *Abstraction and Representation: Essays on the Cultural Revolution of Thinking*, Volume 175 of *Boston Studies in the Philosophy of Science*. Dordrecht: Kluwer.

Diawara, M. (2004). Colonial Appropriation of Local Knowledge. In P. Probst and G. Spittler (Eds.), *Between Resistance and Expansion. Explorations of Local Vitality in Africa*, pp. 273–293. Münster: LIT.

Dirlik, A. (1995). Confucius in the Borderlands: Global Capitalism and the Reinvention of Confucianism. *boundary 2 22*(3), 229–273.

Drazen, A. (2002). Conditionality and Ownership in IMF Lending: A Political Economy Approach. *IMF Staff Papers 49*(Special Issue), 36–67.

Easterly, W. R. (2006). *The White Man's Burden: Why the West's Efforts to Aid the Rest Have Done So Much Ill and So Little Good*. Oxford: Oxford University Press.

Eichengreen, B. (1996). *Globalizing Capital: A History of the International Monetary System*. Princeton, NJ: Princeton University Press.

Eisenstadt, S. N. (2000). Multiple Modernities. *Daedalus 129*(1), 1–29.

Eisenstadt, S. N. (Ed.) (2002). *Multiple Modernities*. New Brunswick, N.J.: Transaction Publishers.

Fanon, F. (1970). First Truths on the Colonial Problem. In F. Fanon (Ed.), *Toward the African Revolution*, pp. 130–136. Harmondsworth: Penguin.

Fischer, B. and H. Reisen (1993). *Organisation for Economic Co-operation and Development. Development Centre, Liberalising Capital Flows in Developing Countries: Pitfalls, Prerequisites and Perspectives*. Paris: OECD Publishing.

Froot, K. (1993). *Foreign Direct Investment*. Chicago: University of Chicago Press.

Gandhi, M. K. (1948). *An Autobiography or the Story of My Experiments with Truth*. Ahmedabad: Navajivan Publishing House.

Gentner, D. and A. L. Stevens (1983). *Mental Models*. Hillsdale, N.J.: Erlbaum.

Gladwin, T. (1970). *East Is a Big Bird: Navigation and Logic on Puluwat Atoll*. Cambridge, MA: Harvard University Press.

Glissant, E. (1993). *Tout-monde*. Paris: Gallimard.

Goldstein, M. (2001). *IMF Structural Conditionality: How Much is Too Much?* Washington DC: Institute for International Economics.

Halperín Donghi, T. (1985). Economy and Society in Post-Independence Spanish America. In L. Bethell (Ed.), *The Cambridge History of Latin America. Vol. 3: From Independence to c.1870*, pp. 299–345. Cambridge: Cambridge University Press.

Haynes, D. M. (2001). *Imperial Medicine. Patrick Manson and the Conquest of Tropical Disease*. Philadelphia: University of Pennsylvania Press.

Hessel, S. and E. Morin (2012). *Wege der Hoffnung*. Berlin: Ullstein.

Hobsbawm, E. J. (1983). Introduction: Inventing Traditions. In E. Hobsbawm and T. Ranger (Eds.), *The Invention of Tradition*, pp. 1–14. Cambridge: Cambridge University Press.

Hutchins, E. (1983). Understanding Micronesian Navigation. In D. Gentner and A. L. Stevens (Eds.), *Mental Models*, pp. 191–226. Hillsdale, N.J.: Erlbaum.

Hutchins, E. (1995). *Cognition in the Wild*. Cambridge, Mass.: MIT Press.

Inkster, I. (2001). *Japanese Industrialisation: Historical and Cultural Perspectives*. London: Routledge.

Jensen, N. M. (2006). *Nation-states and the Multinational Corporation: A Political Economy of Foreign Direct Investment*. Princeton: Princeton University Press.

Kaufmann, S. H. E. (2009). *The New Plagues: Pandemics and Poverty in a Globalized World*. London: Haus Publishing.

Khan, M. S. and S. Sharma (2003). IMF Conditionality and Country Ownership of Adjustment Programs. *World Bank Research Observer 2*(18), 227–248.

Kim, S. S. (2000). East Asia and Globalization. Challenges and Responses. In S. S. Kim (Ed.), *East Asia and Globalization*, pp. 1–30. Lanham: Rowman & Littlefield.

Kumar, T. V. (Ed.) (2007). *Focus India: Postcolonial Narratives of the Nation*. New Delhi: Pencraft International.

Martin, D. (1990). *Tongues of Fire: The Explosion of Protestantism in Latin America*. Oxford: Blackwell.

Mayer, C. (2005). Peacemakers in a Divided Land. *Max Planck Research* (4), 66–71.

McCord, E. A. (1993). *The Power of the Gun: The Emergence of Modern Chinese Warlordism*. Berkeley, CA: University of California Press.

McNeill, J. R. (1994). Of Rats and Men: A Synoptic Environmental History of the Island Pacific. *Journal of World History 5*(2), 299–349.

Memmi, A. (1967). *The Colonizer and the Colonized*. Boston: Beacon Press.

Metcalf, B. D. and T. R. Metcalf (2002). *A Concise History of India*. Cambridge: Cambridge University Press.

Mignolo, W. (2000). *Local Histories, Global Designs: Coloniality, Subaltern Knowledges, and Border Thinking*. Princeton, NJ.: Princeton University Press.

Morin, E. (2001). *Seven Complex Lessons in Education for the Future*. Paris: Unesco Publishing.

Mosley, L. (2003). *Global Capital and National Governments*. New York: Cambridge University Press.

Nitsch, M. (1999). Vom Nutzen des monetär-keynesianischen Ansatzes für Entwicklungs- theorie und -politik. In R. Schubert (Ed.), *Neue Wachstums- und Außenhandelstheorie: Implikationen für die Entwicklungstheorie und –politik*, Volume 269 of *Schriften des Vereins für Socialpolitik*, pp. 183–214. Berlin: Duncker und Humblot.

Nützenadel, A. and F. Trentmann (2008). *Food and Globalization: Consumption, Markets and Politics in the Modern World*. Oxford: Berg.

Oliver, D. L. (1989). *Native Cultures of the Pacific Islands*. Honolulu: University of Hawai'i Press.

Oliver, R. A. and J. D. Fage (1962). *A Short History of Africa*. Harmondsworth: Penguin Books.

Osterhammel, J. (2009). *Die Verwandlung der Welt: Eine Geschichte des 19. Jahrhunderts*. Munich: Beck.

Petersson, N. P. (2000). *Imperialismus und Modernisierung: Siam, China und die europäischen Mächte (1895–1914)*. Munich: Oldenbourg.

Polanyi, M. (1983). *The Tacit Dimension*. Gloucester, Mass.: Smith.

Porter, P. W. (2006). *Challenging Nature: Local Knowledge, Agroscience, and Food Security in Tanga Region, Tanzania*. Chicago: University of Chicago Press.

Randeria, S. and A. Eckert (Eds.) (2009). *Vom Imperialismus zum Empire: Nichtwestliche Perspektiven auf Globalisierung*. Frankfurt am Main: Suhrkamp.

Rodrik, D. (1998). Has Globalization Gone Too Far? *Challenge 41*(2), 81–94.

Rowse, T. (1999). Terra nullius. In G. Davison, J. Hirst, and S. MacIntrye (Eds.), *The Oxford Companion to Australian History*. Melbourne: Oxford University Press.

Rudolph, S. (2005). Presidential Address: The Imperialism of Categories: Situating Knowledge in a Globalizing World. *Perspectives on Politics 3*(1), 5–14.

Sahlins, M. (1981). *Historical Metaphors and Mythical Realities: Structure in the Early History of the Sandwich Islands Kingdom*. Ann Arbor: University of Michigan Press.

Sahlins, M. (2000). Cosmologies of Capitalism: The Trans-Pacific Sector of the "World-System". In M. Sahlins (Ed.), *Culture in Practice: Selected Essays*, pp. 415–469. New York: Zone Books.

Steger, M. B. (2003). *Globalization: A Very Short Introduction*. Oxford: Oxford University Press.

Strange, S. (1997). *Casino Capitalism*. Manchester: Manchester University Press.

Thiering, M. and W. Schiefenhövel (2012). The Equilibrium Controversy. Guidobaldo del Monte's Critical Notes on the Mechanics of Jordanus and Benedetti and their Historical and Conceptual Background. In M. Schemmel (Ed.), *Spatial Thinking and External Representation: Towards a Historical Epistemology of Space*, Max Planck Research Library for the History and Development of Knowledge. Berlin: Edition Open Access.

Thomas, N. (1991). *Entangled Objects: Exchange, Material Culture, and Colonialism in the Pacific*. Cambridge, MA: Harvard University Press.

Thomas, N. (1997). *In Oceania: Visions, Artifacts, Histories*. Durham, NC: Duke University Press.

van Laak, D. (2004). *Imperiale Infrastruktur: Deutsche Planungen für eine Erschließung Afrikas 1880–1960*. Paderborn: Schöningh.

Vreeland, J. R. (2003). *The IMF and Economic Development*. New York: Cambridge University Press.

Waechter, M. (1996). *Die Erfindung des amerikanischen Westens. Die Geschichte der Frontier-Debatte*. Freiburg im Breisgau: Rombach.

Waldron, A. (1991). The Warlord: Twentieth-Century Chinese Understandings of Violence, Militarism, and Imperialism. *The American Historical Review 96*(4), 1073–1100.

Wolfrum, R. (2010). *Heidelberg Darfur Dialogue Outcome Document*. Heidelberg: Max Planck Institute for Comparative Public Law and International Law and the Peace Research Institute of Khartoum. http://www.mpil.de/shared/data/pdf/hdd_outcome_document.pdf.