



## Cultural Exchange in a Heterogeneous Research Field: Approaching Scientific Culture with Anthropological Thought

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# Cultural Exchange in a Heterogeneous Research Field

Approaching Scientific Culture with Anthropological  
Thought<sup>\*†</sup>

Daniela Baus<sup>‡</sup>

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The article examines cultural anthropological approaches to cultural boundaries and cultural change. It suggests that these approaches to cultural change can be made fruitful for understanding how cultural elements spread across different scientific communities, and the possible effects such dynamics could have on the negotiation of boundaries in the field. The article is based on an ethnographic study of nanoscale research and reflects on where to look for moments of boundary transgression in this field that is characterized by its multiple dimensions of inclusion and distinction.

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How do cultural elements cross community boundaries in science? Which forms of cultural exchange are involved in multidisciplinary research? And does cultural exchange affect the ways scientific communities construct their respective field and its boundaries? These questions are central to my ongoing project on scientific culture in nanoscale research in Switzerland. The institute I visited is a joint venture of departments of physics, biology and chemistry, populated by a heterogeneous and multidisciplinary group of scientists. The aim of my project is to use ethnographic methods to examine whether the boundaries between those disciplinary communities blur and a new community emerges that shares practices and meanings and affiliates itself with nanoscale research. Therefore, I am interested in understanding

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how cultural elements spread across different communities, how cultural forms are created within a heterogeneous field, and the possible effects such dynamics could have on the negotiation of boundaries in the field. This raises the problem of finding appropriate concepts to help address these questions.

In this article I turn to cultural anthropology and its investigations of cultural boundaries and cultural change with respect to ever-higher transnational contacts and migration. I would like to suggest that these approaches to cultural change can be made fruitful for STS, and especially the investigation of scientific culture in multidisciplinary research fields. I will begin with a brief review of how science studies discuss culture and boundaries (1). Then I will present two concepts developed in cultural anthropology that concern processes which lead to cultural exchange, to a dissolving of boundaries and a creation of cultural forms (2). On this basis I will propose four dimensions for further research into scientific culture, community boundaries, and contact zones (3). These dimensions are not to be understood as comprehensive but merely as reflections on where to look for moments of boundary transgression in a heterogeneous field, characterized by its multiple dimensions of inclusion and distinction. As they are developed based on an ongoing ethnographic study of a specific research field they have to stay fragmentary and might reflect some of its particularities.

## I. CULTURE AND BOUNDARIES IN SCIENCE AND TECHNOLOGY STUDIES

Notions of culture and boundaries underlying work in STS are diverse and based in different disciplinary and theoretical frameworks. In the following, I will introduce but a few important approaches.

In her *anthropological* ethnographic investigation of particle physicists, Sharon Traweek (1988) operates with a definition of culture adopted from Clifford Geertz: "A group's shared set of *meanings*, its implicit and explicit messages, encoded in social action, about how to interpret experience" (7-8). An understanding of culture as practices and meaning is shared by Diana Forsythe (2001) who, in addition, raises the problem of cultural boundaries. A particular group of scientists typically shares a large part of their culture with colleagues in other countries, in other disciplines or with their fellow citizens. Hence, cultural boundaries between the different groups are not clear-cut. Forsythe points out that scientific communities, nevertheless, do have some meanings and practices in common that distinguish them from other groups of people—and, based on these communalities, membership in scientific communities is acknowledged.

In a more *sociological* reading of culture Karin Knorr Cetina ties it to the notion of episteme and suggests that disciplinary communities

relate to specific ways of knowledge production. In *Epistemic Cultures* (1999) she focuses on the specific differences between two such cultures, particle physics and molecular biology, and what sets them apart. Due to this comparative perspective, cultures here appear as entities that can be distinguished from one another. An interest in comparison is shared by Tony Becher (1989) in his investigation of the differences between “disciplinary cultures” of physics, history, biology, sociology, mechanical engineering, and law. Becher particularly analyzes questions of identity and distinction and claims that disciplinary groups establish a strong cultural identity, and thus set their boundaries, by using a distinct language. The boundaries between those cultures are defended against outsiders through cultural elements such as traditions, customs, practices, transmitted knowledge, beliefs, morals and rules of conduct, and linguistic and symbolic forms of communication.

Boundaries also feature prominently in the work of Gieryn (1983; 1995) but, in contrast, he particularly focuses on the construction of boundaries and the distinction between science and non-scientific domains. Gieryn argues that scientists negotiate and rhetorically draw the boundaries of science to legitimize its authority. But “boundary work” does not only aid the understanding of distinction; it also helps to illuminate the shifting of boundaries, a process through which new inclusions and exclusions are created within the pattern of scientific fields and subfields.

The above studies illustrate that scientific culture has been addressed in STS with an interest in the reproduction, the practices and the identities of epistemic communities. In line with this work, I consider it to be productive to examine the potentially emerging scientific community of nanoscale research in cultural terms. But as this field is located at the interface of several disciplines—a situation little studied with regard to culture in STS so far—it is my contention that additional approaches and concepts may be productive to capture the dynamics. For this reason I propose to take into account anthropological models such as the concept of creolization and the notion of the hybrid to gain further understanding of how shared cultural elements may appear across scientific communities that understand themselves primarily as distinct.

## II. CULTURAL CHANGE IN ANTHROPOLOGY

### *Creolization*

For some time now transcultural contact has been a major research topic in anthropology. Dedicated studies investigate the deterritorialization of culture, transnational relations, and their impact on cultural identities (cf. Appadurai 1996). They explore how cultural forms emerge and how

boundaries shift and change. These approaches seem to be equally fruitful in analyzing how specific cultural forms might emerge and spread in science as well as how group identities are (re-)negotiated. One possibility is to address this process through the concept of creolization. Originally developed in linguistics, “creolization” was adopted in cultural anthropology during the 1980s and has been subsequently extended to cover culture as well as language. Creolized culture (in analogy to the concept of creolized language) is understood as a culture that is rooted in two or more historic domains. The starting point for such an emergence of new cultural forms is often trade or exchange (Kapchan and Turner Strong 1999). Creolization is then regarded as a process which takes place during the course of time when the origin cultures integrate and intermix with each other. Throughout this process people are born and grow up within the new context and are influenced by the respective different systems of meaning (Hannerz 1987).

Ulf Hannerz’s<sup>1</sup> (1987) study of Nigerian culture is particularly fertile for the question of creolization. Nigeria, a country with approximately 250 tribes and as many languages, seems a prime example for a place without cultural or language homogeneity. At first glance there is not one ‘Nigerian’ culture that could be studied with ethnographic methods and drawing on anthropological concepts. However, a closer look reveals a picture that contradicts the image of a cultural mosaic. While Hannerz acknowledges that most African states are an arbitrary product of European colonialism, he claims that the foundation of a state can lead subsequently to the formation of a nation. This process is sustained by the accumulation of shared history and by the creation of a shared administration, education and media. Hence, through these channels, common ground is established across very different cultures.

On an international level, creolization is promoted by transnational connections between people, i.e. migrants, who should not be viewed as disconnected from their home countries (Hannerz 1987; Glick Schiller et al. 1995). Instead, those people connect the world and function as transmitters of cultural forms, models and elements, and thus foster transfer processes between different communities.

In science studies, Peter Galison (1997) has promoted a linguistic model of creolization by introducing the notion of *trading zones*. He adopts the concepts of pidgin- and creole languages which evolve in trading contexts between two or more (scientific) groups to enable exchange relations. Galison uses this model to explain how engineers, theoretical physicists and experimental physicists produce a “foreigner version” of

<sup>1</sup>Hannerz’s further research includes urban societies, local media cultures, transnational cultural processes, and globalization.

their results and thus create a “trading zone” in which different scientific communities can interact and communicate (782-837). Collins et al. (2007) develop this concept further and suggest that several types of trading zones exist, dependent on whether a collaboration is co-operative or coerced and whether the outcome is a heterogeneous or a “homogeneous culture.”

Critics in cultural anthropology have opposed the concept of cultural creolization for several reasons. First, it has been noted that the analogy between language and culture is limited. Instead, cultural creolization should be understood merely as a metaphor that cannot replace a subsequent analysis (Palmié 2007). Second, and more profoundly problematic, authors such as Palmié and Eriksen (2007) argue that creolization is based on the presupposition that pure forms with clear boundaries exist, which are then thought to intermix.<sup>2</sup> However, theorists in favor of creolization do not argue for distinct and homogeneous cultures, instead they assume culture to be single entity that cannot be pluralized (Drummond 1980; Hannerz 1996; Handler 2002). But they argue that, nevertheless, cultural differences and boundaries exist, and thus suggest understanding creolization as a useful instrument for analyzing cultural processes across boundaries as well as the shaping of new formations (cf. Eriksen 2007). Galison has shown how creolization can explain exchange, communication and the creation of a shared language across different scientific communities. I also consider creolization to be a useful framework (despite its limitations) in which to address emerging scientific culture, communities and the renegotiation of boundaries.

### *The Hybrid*

Complementary to creolization is the notion of the hybrid. Since the 1990s, the hybrid has been discussed especially in interdisciplinary discourses on media, migration and history (Kapchan and Turner Strong 1999; Martini 2001). The notion of hybrids has principally referred to the mixture of two ethnies.<sup>3</sup> They are viewed as encompassing two or more historically distinct realms which lose their distinctiveness as a result

<sup>2</sup>Another debate circles around the use of the creolization model in global culture theory without taking into account its particularities due to its emergence in the study of Caribbean culture. However, representatives of global culture theory state that their concept has been derived directly from the more abstract linguistic understanding of creolization and not from anthropological investigations of Caribbean culture (cf. the debate between Munasinghe 2006 and Hannerz 2006).

<sup>3</sup>While hybrids in this article are discussed as mixtures between different cultural domains and communities, hybrids of a different kind are suggested by Latour (1993) when he writes of human and non-human hybrids.

of their contact. I would like to propose that also this concept can be productively applied to the world of the sciences.

Néstor García Canclini (2001) investigates “Latin American hybrids,” ascribing hybridity in this case to the cultural and biological diversity of Latin American people. He focuses on cultures (in the plural) while noting that they are inherently hybrid. According to García Canclini cultures are not stable and enduring entities. As hybrids they undermine dualities of North/South, European/Indigenous, and high culture/mass culture. This author’s investigations show in particular that the ever higher transnational flow of people, capital and messages, i.e. cultural symbols, affects an individual’s cultural identity. Because every person in contemporary societies has frequent contact with many cultures, a person’s identity cannot be exclusively determined by belonging to a nation or region. The groups in which identity is created are not solely defined by a spatial region, a shared language or even face-to-face contact. Instead, identity is profoundly influenced by intercultural borrowings. This insight leads García Canclini to conclude that studies should not only focus on differences between cultures but also include hybrid forms (García Canclini 2001).

What we gain from this notion for the understanding of changing and emerging epistemic culture in particular is an attention to the circumstances of cultural contact and symbol flow that lead to hybrid cultural forms and identities.

### III. RETHINKING CULTURAL EXCHANGE IN SCIENCE

How then to adopt the anthropological concepts of creolization and hybridity to the investigation of scientific cultures? I do not propose to ask whether a research field is a creole or hybrid or not. My suggestion is rather that, based on these two concepts, four dimensions can be identified that might prove fruitful in addressing the multiple processes of cultural flow, creation of new cultural forms, and shifting community boundaries in heterogeneous fields. These dimensions are complementary to each other as they take different perspectives on the same phenomenon: cultural exchange in multidisciplinary research fields.

Communicative Space: The starting point of creolization processes is exchange, trade or simply the necessity of communication across communities. In science, such contact zones across community boundaries are found, for example, in research areas that are not exclusively based in one discipline but in which scientists rely on results and expertise from other disciplines to conduct their studies. These scientists have to collaborate—at least to a minimum extent—with other disciplines for supplies, experiments or theory. In such an environment one criterion that promotes creolization is met: the need to communicate,

whether this exchange is oral and informal, formal at conferences or undertaken through journals and the exchange of papers. On the basis of these ideas, empirical studies should investigate which possibilities for communication across epistemic boundaries exist and how they are used. One has to reflect on whether there is institutional support for interdisciplinary research or whether interdisciplinarity is merely an 'empty' claim. An ethnographic study could build on the concept of *trading zones* and—while avoiding the idea of “homogeneous cultures”—investigate whether such zones of interaction affect the symbols, practices and identities of communities, and possibly merge formerly distinct communities on cultural terms.

Constitution of institutions: Considering Hannerz's analysis of creolization in Nigeria and the role of the foundation of institutions such as states, the question arises if the same could be true in science. Disregarding particularities of 'postcolonial' states, could the constitution of scientific institutions (e.g. research networks, research centres and courses of studies) trigger a shared cultural identity? Institutional and financial stimulation, the facilitation of communication within research networks, as well as shared education within a study program might promote the development of common perspectives as well as meaning, practices and cultural identity. Could this lead to the emergence of a novel scientific cultural community? Just as well one might imagine that the increased perception of 'the others' can lead to a stronger distinction and emphasis on cultural differences.

Symbol flow: When looking into the concept of the hybrid, the idea of transcultural symbol flow seems to be most relevant for the emergence of hybrid identity. Searching for symbol flow in science could start with an exploration of the diffusion of instruments, devices, journals, textbooks, methods and stories across epistemic boundaries. Thus, the particular channels through which meaning is transported across boundaries must be analysed, in addition to how this meaning is integrated in new contexts, and whether this creates a connection between the involved communities and if so, what kind of connection. This raises the question: in which ways and to what extent does this exchange influence the construction of identity in science? Is it conceivable that some kind of group identity could emerge, based on belonging to the same field of discourse, sharing the same instruments and using the same methods? Whether this is the case would then depend, one might assume, on the reception of journals, on the respective meaning assigned to instruments, methods and practices and their embeddedness.

Migrating scientists: According to the creolization concept it is mainly people who provide transfer of cultural elements, such as symbols and



practices, into new contexts. Thus, to explore cultural transfer processes, one should identify and follow processes of human mobility and fluctuation. Anthropological studies address this perspective by looking into the issue of transnational migrants. In the case of scientific culture, the notion of transnational migrants can be translated into a notion of “transcommunity migrants,” i.e. scientists who work in a different community or field than the one in which they studied or scientists who have changed their disciplinary affiliation. We need to examine how these “migrants” affect the scientific culture of their new colleagues, their symbols, practices and values. Do they take along cultural elements as they move across communities? And if so, do those transferred elements spread out in their new epistemic environment?

These dimensions are of interest because they might constitute sites where boundaries between sciences are renegotiated and reconstructed and cultural elements are transferred into new contexts. As outlined above, the objective of my ethnographic study is to examine whether the nanoscale research field shows specific common practices and meaning, and if those cultural communalities give rise to the formation of a community. While a certain amount of shared ways of working and making sense of their work can be observed, every group, at the same time, shows internal variation. Thus, a criterion for whether a nanoscale research community exists or not cannot be cultural distinctiveness or uniformity. Instead, we must further ask whether the group understands and represents itself as a group and creates a feeling of we-ness or cultural identity based on certain shared cultural elements (cf. Barth 1969, 15).

The creolization concept can guide the investigation of how shared cultural forms emerge across sciences and how communities establish themselves through a renegotiation of former boundaries. Empirical examination of processes in the four suggested dimensions and associated questions seems promising to illuminate cultural contact and transfer processes across community boundaries.

However, the outcome of such investigation is open. Instead of showing that ‘creolization’ occurs and new groups emerge, research along those lines could also enlighten strategies of resistance against such intermixing, cross-community communication and collaboration. In an investigation of ethnic identity, Barth has shown that boundaries can be maintained despite close contact between ethnic groups (Barth 1969, 21-26). Eventually, the investigation of creolization processes in science could also illuminate the multiple ways in which scientists might defend established boundaries and resist demands for “interdisciplinarity” and the ready adoption of buzz words like nanoscience to construct their identities.

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