

## Constructivist Paradoxes Part 1: Critical Thoughts about Provincializing, Globalizing, and Localizing STS from a Non-Hegemonic Perspective

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### Abstract

There is a certain ‘failure’ in what we could call the *modern* development of the STS field over the past decade, i.e. a large number of studies—particularly empirical—that were deployed from the 1970s onwards. Indeed, one of their original and crucial objectives was to emphasize the local, situated, contingent character of the processes of production and negotiation of knowledge. However, these studies mostly concentrate on one part of the world, i.e. the most developed countries, precisely where modern science, commonly referred to as “Western Science,” developed. This limitation—surely intuitive or “natural”—has several consequences analyzed in this article. In summary, these limitations can be analyzed in terms of the objects of research (the various forms of knowledge) but also in terms of the theories and methods used to account for them. The aim is to discuss the construction of a double (or even triple) peripheral situation, which calls into question the old principles of symmetry and impartiality ([Bloor 1976](#); [Collins 1981](#)): on the one hand, the peripheral character of the objects analyzed (i.e. science and scientific development outside Euro-America) and, in parallel, the peripheral situation of the communities of specialists who dedicate themselves to studying them. Connected to this, an additional question emerges: What are the theoretical frameworks and methodologies best suited to account for these objects in their respective contexts? Is it suitable to simply apply to these objects of study the same theoretical frameworks and methods commonly used to analyze hegemonic science? And last but not least, how to approach the (scientific, cultural, political) relationships between different contexts in a highly globalized world? This is the first of two parts: while in the first one I discuss the “failures” of the hegemonic paradigm in STS and its consequences in relation to non-hegemonic contexts. The second part—appearing in volume 8, issue 3—focuses on the consequences for the case of STS research in Latin America and the dynamics of its specific agendas.

### Keywords

situated knowledge; centers & peripheries; global science; Latin America

### Introduction

When I wrote an article on the dynamics of knowledge production at a research center in Ushuaia, Tierra del Fuego ([Albarracín and Kreimer 2013](#); [Kreimer 2019](#)), I was obliged to explain where the town was, display a

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map so readers could place it, and justify at length why studying the production—and internationalization—of knowledge on that locale was relevant to understanding part of the dynamics of science today. And the same can be said when; Hebe Vessuri analyzed the nanosciences in Venezuela ([López Cadenas, Hasmy, and Vessuri, 2011](#)), Marcos Cueto explained the emergence of the Andean biology in Peru ([Cueto 1989](#)), Jaime Benchimol analyzed the development of microbiology in Brazil ([Benchimol 1999](#)), and Ismael Ledesma ([2009](#)) focused on the emergence of biology in Mexico. Everyone must first explain where this “locality” is, why it is relevant, and what the study of these objects can contribute. None of this is observed as “natural” in the development of modern science and, therefore, those who study it must justify these objects of research in a double movement.

In contrast, as we shall see, technoscience in the more developed countries does not need to explain its “locality”: these are the “natural” sites where all new scientific fields emerged and developed, and from where they have spread to less developed contexts ([Pyenson 1985](#)). In fact, as Anderson ([2018, 73](#)) notes, “When George Basalla published his article, ‘The Spread of Western Science,’ in *Science* in May 1967 it made scarcely a ripple, let alone a splash.” Possibly, as Anderson himself concludes, because “. . . most historians of science regarded such inquiries as secondary matters, as distractions from their main task of elucidating processes of scientific discovery and justification in Europe.” The same can be said of the sociology or anthropology of science, mostly oriented to observe “la science telle qu’elle se fait” ([Callon and Latour 1991](#)), i.e. the real practices of scientists and engineers in their working sites, the actual fabrication of knowledge in the exclusive context of Euro–America.

Indeed, there is a problem that triggered STS debates during the last decade: how most of the approaches that (for discursive convenience) I will call “constructivist” or even more simply “science studies” ([Pestre 2006](#)) addressed the question of locally situated knowledge, as well as emergent criticisms, generally associated with postcolonial approaches. However, these texts are far from resolving the question; rather, they are a starting point for developing a more comprehensive approach to issues like global asymmetries in international links between scientists, the different circuits of knowledge production (both scientific and not scientific), or how these new, hitherto relatively ignored “localities” can affect mainstream science. I suggest a re-reading of the old notions of centers and peripheries in light of the knowledge, concepts, and methods currently available to us.

### **Locales: Understanding STS Knowledge Development**

The various constructivist (understood in a wider sense as “the construction metaphor,” [Sismondo 1993](#)), ethnomethodological, and other approaches developed after the Strong Program ([Bloor 1976](#)) laid special emphasis on confronting universalist positions, which had until then been hegemonic (and whose most famous spokesperson was Robert Merton). Expressly opposing the Mertonian norm of universalism was the norm of the local character of knowledge, where each context and each configuration—social, cultural, and economic—is important to understand the development of knowledge, its legitimacy, interaction, or co-

construction with a social order.<sup>1</sup> However, the criticism of what we could call a certain “universalist common sense” in the study of science, and the consequent development of a large number of studies located in specific contexts to observe the processes of knowledge production, was not accompanied by a reflection or an analysis of the hegemonic character of these contexts. Rather, these spaces were considered as those where negotiations, resource mobilization, controversies, translations and formation of networks (to take some central concepts) simply occurred. The power relations that these actors could establish with actors located in “other” contexts (including geopolitical considerations) were generally ignored.

The following statements by two influential French authors of the late twentieth-century social sciences—Pierre Bourdieu and Bruno Latour—exemplify this well, and show that these power relations are far from being an exception. When speaking of the genesis and structure of the literary field, Bourdieu does not feel it necessary to explain that he will be setting out to study the French literary field or limit Gustave Flaubert’s role in that process. With no reference to the local—the genesis of the French literary field is the genesis of the literary field tout court:

We know how much Flaubert contributed, along with others, notably Baudelaire, to the constitution of the literary field as a world apart, subject to its own laws. To reconstruct Flaubert’s point of view, that is, the point in the social space from which his vision of the world was formulated, and that social space itself, is to have a real chance of placing ourselves at the origins of a world whose functioning has become so familiar to us that the regularities and the rules it obeys escape our grasp ([Bourdieu 1996, 48](#)).

In their classic book on laboratory life, Bruno Latour and Steve Woolgar note that:

It might also be objected that the work of the particular laboratory we have studied is unusual in that it is relatively poor at the intellectual level; that its activity comprises routinely dull work, which is not typical of the drama and conjectural daring prevalent in other areas of scientific work. However, the Nobel Prize for Medicine was awarded to one of the members of our laboratory in 1977, soon after we began preparation of this manuscript. If the work of the laboratory is merely routine, then it is possible to receive what is perhaps the most prestigious kind of acclaim from the scientific community for the kind of routine work we portray ([Latour and Woolgar 1979, 32](#)).

Nowhere in the book is there any hint that their analysis of the construction of scientific facts is performed in one of the most prestigious laboratories in the world: namely, La Jolla, California. What is more, the word “California,” a “situated” place of knowledge production, appears only two times in the entire book: one time, in tangential reference to the requirements of the University of California, and the second time to affirm how scientists marvel at the “universalization of knowledge”: “How extraordinary that a peptidic structure discovered in California works in the smallest hospital in Saudia Arabia [sic, 183]!” This, however, by no means calls the authors into question.

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<sup>1</sup> The discussion about contexts is certainly far from settled (See [Asdal 2012, 2019](#)).

### Outside: Beyond Euro–American Accounts of STS

Let us briefly observe how the history of STS was written, and how awareness of the existence of other contexts in which scientific knowledge is produced slowly appeared over the years, from an exclusively Euro–American perspective to other more open visions. The STS field has steadily expanded since the incipient studies during the 1970s—with the creation of numerous programs, research centers, spaces for the education of young generations, journals, scientific societies, and so forth. Consequently, the output of literature expanded accordingly, extending the list of topics and methods as widely differing theories and diverse modes of research emerged.

Therefore, some years later, we find a good many studies which we might term “reflective” or which set out to reconstruct the history of the field itself. This is not new: all scientific fields are constructed on an “origin myth” and organize the lines of its development. It is, however, of interest to take a brief look at some of these texts, which will be revealing for our purposes. For example, analyzing the development of the knowledge base of science and technology studies, Martin et al. (2012) look at the literature produced after the 1960s, continuing such ‘prehistoric’ founders of the field as Ludwik Fleck, Robert Merton, or John Bernal. On the one hand, they mention a handful of programs and centers created since then, and then engage in a bibliometric study. The article, which contains some excellent findings,<sup>2</sup> draws up a table of the 155 most cited texts, all in English. Yet there is not a single reference to this linguistic bias throughout the text, nor about whether it is a consequence of the type of resource used (ISI). *The issue simply does not exist.*

Put another way, as Maureen McNeil has clearly stated, the history of STS is the history of this field in Western Europe and North America (McNeil 2005). We find something similar in other excellent texts, such as the books by David Hess (1997), by Stephen Cutcliffe and Carl Mitcham (2001), or by Sergio Sismondo (2004), as well as in the books of Dominique Vinck (1995) or Olivier Martin (2005), to name a few authors in languages other than English.

We also see the same bias in the highly significant handbooks published by the Society for Social Studies of Science (4S). For instance, in the 1995 edition of the handbook (Jasanoff et al. 1995), David Edge (1995) gives a brilliant account of the founding of STS, only . . . with the same slant. Texts appear in this handbook for the first time, however, introducing and problematizing the issue of gender “from STS” (Fox Keller 1995). The next edition of the handbook (Hackett et al. 2008) features, for the first time, a text about the development of science and technology “in other contexts”; I refer to the article by Warwick Anderson and Vincanne Adams, who introduce the concept of “postcolonial” by noting that;

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<sup>2</sup> It shows, for example, that of the ten texts with the highest “h” index in the STS field, eight are books and just two are papers. Likewise, the proportion of books in the top fifteen most cited texts are also extremely high.

Postcolonial investigations of proliferating modernities, or “development,” might offer some guidance for scholars in science and technology studies, yet they are largely ignored. ([Anderson and Adams 2008, 183](#))

But this article is the only text of 38 in the book to refer to “knowledge situated” outside “Western science.”<sup>3</sup> The same volume also contains a text by Susan Cozzens analyzing the different theoretical approaches to the relationship between “science and development.”

The STS literature includes stories that take place in the global South but does not try to add them up into an account of changing macro structures in the world economy or a coherent theory of development ([Cozzens et al. 2008, 789](#)).

It is only in the most recent handbook ([Felt et al. 2017](#)) that the subject of knowledge in “other” contexts gains a little more ground, particularly in the texts by David Hess et al. ([2017](#)) and Banu Subramaniam et al. ([2017](#)). Interestingly, both incorporate the “subalternity” of the developing world in close association with the issue of gender. Moreover, Hess’s article is one of the few that looks at STS literature outside Europe and the United States and, in addition to mentioning various Latin American texts, cites one published in Portuguese (the only reference outside the English language).

### **Pathways: The Problem with STS in Center Contexts**

For a few decades now, a certain unease has emerged, expressed by some scholars, about the pathways the broad avenue of hegemonic STS has been taking. The first inklings of this unease arose from feminist studies, particularly the crossover between science studies and feminist studies in the unique voices of Donna Haraway, Evelyn Fox Keller, and especially, for her persistence over the years, Sandra Harding. This unease criticized most authors’ lack of awareness of the slanted nature of their work, in particular their neglect of the gender dimension in their research. Sandra Harding, for example, commenting on three of the mainstreams in STS (Beck, Latour and Nowotny), states that “[there is] a feature unfortunately shared by all three. They are all significantly gender-blind” ([2008, 26](#)).

On that basis, Harding stresses that these studies did not consider the Eurocentric dimensions in the study of the technosciences, which would point to an obvious lack of reflexivity, while drawing attention to the importance of considering “other sciences.” In a later text, compiling different views of postcolonial STS, Harding considers that there is an obvious convergence of interests in the current state of feminist and postcolonial studies:

The agendas of feminist and postcolonial science and technology studies are similar in important respects and thus would seem to be complementary. ([Harding 2011, 12](#))

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<sup>3</sup> I use “situated” here in a sense that goes beyond the geographical, closer—although not identical—to the one Haraway ([1988](#)) emphasized.

Several authors have highlighted the importance of postcolonial studies in STS, including most contributors to the book edited by Harding, as well as Warwick Anderson ([2002](#), [2009](#), [2017](#)), David Hess et al. ([2017](#)), Maureen McNeil ([2005](#)), Suman Seth ([2009](#)), or more recently, David Dumoulin et al. ([2018](#)) among others. There is certainly also abundant literature addressing the issue from a historical viewpoint, developing critical perspectives of the more traditional studies that observed the expansion of Western science, from the classic text by Basalla ([1967](#)) to far more erudite, documented inflections of the imperial sciences and gathering spaces where Western Science encounters other cultures. There is no room here to go into all of this rich and abundant literature.<sup>4</sup>

A mark shared by all these texts is the vindication of the attention that has to be directed at the development of science in the Global South and at questioning the narrow nature of STS studies, which has, for many decades, focused exclusively on Euro-America. However, the text that has, in my view, created the greatest stir is the one by John Law and Wen-Yuan Lin ([2017](#)), first presented by Law as a speech on receiving the John Bernal Prize (awarded in 2015 by the 4S) and later published in *East Asian STS (EASTS)*. The authors open by admitting—like others—that, despite an abundance of postcolonial STS studies, mainstream STS in Euro-America generally ignored what was happening outside their own spaces. But they go one step further and ask themselves about the analytical frameworks under which technoscience is analyzed *in other contexts*. They point out that STS has usually made use of Euro-American analytical terms and that reflexivity has to be exercised to analyze not just the modes of development and the dynamics of technoscience in non-hegemonic contexts but, more incisively, how the hegemonic concepts of STS have to be called into question to study such practices.

A personal anecdote suffices to illustrate these difficulties. At the joint 4S/EASST (European Association for the Study of Science and Technology) conference in Paris in 2004, myself and other colleagues proposed a paper session entitled “Techno-Scientific Relationships between Centers and Peripheries.” Although the session was willingly supported, we spotted a slight amendment to the final program: “Science and Technology *IN* Peripheral Contexts.” In other words, this was not an issue of interest to people from “the centers.”

The picture has certainly changed a great deal over the past few years, and the signs of “openness” have only increased.<sup>5</sup> However, along with the unresolved issue of the development of more accurate theoretical

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<sup>4</sup> See Kreimer ([2019](#)) for a more developed analysis. Some of the most historically lucid analyses are in Agrawal ([1995](#)), MacLeod ([1996](#)), Raj ([2007](#)), and Anderson ([2006](#)).

<sup>5</sup> We should remember the various expressions of interest from a growing number of researchers in technoscience outside Euro-America, the organization of a trilingual (English, Spanish, Portuguese) 4S congress in Buenos Aires in 2014, or the first award of the John Desmond Bernal Prize to a researcher from outside Euro-America—Hebe Vessuri in 2017. It is also worth noting several special issues of mainstream journals, like *Science, Technology, & Human Values* or *Science as Culture*, devoted to these issues.

frameworks to understand technoscience in non-hegemonic contexts, as Law and Lin point out, various other issues persist, as I try to show in the following section.

### Regions: Refusing Northern Conceptual Framework Constraints

STS perspectives were deployed in different regions (beyond the Euro-American objects), particularly during the last two or three decades. However, this development is far from being unproblematic: while some perspectives aimed at developing specific concepts, methods and agendas to account for scientific knowledge and its specific consequences in such non-hegemonic contexts, others simply adopted mainstream perspectives and applied them to their objects of study. Daiwie Fu (2007) has pointed out (also discussed by Law and Lin 2017):

Haven't we taught our students STS with good case studies still mostly coming from the West? And haven't we theorized our East Asian STS case studies also mostly from established Western theoretical perspectives: SSK, SCOT, ANT, Social World, cyborg feminism, bio-medicalization and all that? (Fu 2007, 2)

Let us say right away that we see the same unease in other regions, for instance, in Latin America. In the passage above, we can simply replace "East Asian" with "Latin American," and the content will remain equally true. Indeed, some STS scholars in Latin America engaged in applying the same theoretical frameworks without wondering what differences there were between John Law's study on aeronautics (2002) or Michel Callon's on the electric car (1979), Harry Collins's on artificial intelligence (2018), Joan Fujimura's on the genetics of cancer (1988), or Sheila Jasanoff's on regulatory science (2011), not to mention Louis Pasteur and Bruno Latour's microbes (1993), or Andrew Pickering's quarks (1984). Most authors do not question the appropriateness of these (mainstream) theoretical frameworks and these (mainstream) objects when they attempt to study the technoscientific practices in Mexico City, São Paulo, Bogotá, Santiago de Chile, or Buenos Aires.

Along the same lines, we could almost perform a Basallian analysis and watch the "spread of Western STS" (1967). For that matter, inasmuch as hegemonic approaches have diversified into numerous currents, we can also identify Latin American groups based on who they identify with: Callonians, SCOTs, Latourians, Jasanoffians, Third Waves, Bourdians, and even those militating to interpret national systems of innovation in Latin America. Indeed, dozens or hundreds of studies have been conducted using these approaches, and new generations have formed incorporating these approaches as part of their habitus.

Most of these groups have rarely questioned themselves over the validity of these conceptual frameworks in interpreting these realities. But that is not the whole story. Compared to previous ones and also in parallel, for several decades now, other research objects have been constructed that, either by developing ad hoc conceptual frameworks or by combining certain hegemonic frameworks with creative developments, have given rise to other perspectives on the relationships between sciences, technologies, and societies. According to Harding (who devoted an article specifically to the issue in Latin America), "they refuse to be constrained by the northern science and technology studies (STS) conceptual frameworks" (2016, 3).

At this point, it is necessary to make a few brief notes about the issue.

### **Distance: Recognizing Scientific Pluralism in Global Dynamics**

For the sake of precision, it is essential for us to adjust our language to the tensions we want to explain. The first tension is around some categories normally used to refer to the entire universe outside Euro-America: concepts like “the Global South,” “developing countries,” “peripheries,” “non-hegemonic countries,” and the like. In my view, the same goes for the concept of “postcolonial.”<sup>6</sup>

These definitions have two problems: the first, and undoubtedly the older, is that they lump together a lot of quite distinct contexts and situations. For example, where scientific development is concerned, they put Brazil, Mexico, or Argentina in Latin America, Egypt in Africa, and several Southeast Asian countries, which have had scientific traditions for a century and a half, more than 60,000 researchers, fully-equipped laboratories, and significant R&D funding, in the same category as countries with a total of three hundred or five hundred researchers, covering a handful of scientific disciplines, and often with no funding.

Additionally, these concepts seem to be static and ahistorical, making it difficult to record changes over time. Until a few years ago, for example, China was considered a “developing country,” despite having long been one of the world’s top producers of papers registered in databases.

In light of this, the use of such categories should be avoided, and, by recognizing “scientific pluralism” ([Kellert et al. 2006](#)), we should instead think of more rigorous categories to account for each situation, and each complexity. This does not, of course, mean giving up the search for common denominators to help us explain the specific variables we are interested in, but it does mean reflecting on our use of labels, which can lose much of their heuristic value through excessive simplification.

As an example of this, we should remember that Harding ([2008](#)) proposed several topics that could, if properly developed, form a genuine research program: (1) inclusion and beyond; (2) new histories, sociologies, epistemologies, and philosophies of science; (3) multiple sciences: past, present, future; (4) relations between scientific and technological traditions? (5) should science and technology studies become a site of public debate?; (6) modernity as a horizon for Northern science and technology studies? Her approach is enriching, solid, and provocative. However, I am convinced that it would gain in robustness if several of the concepts, like “South,” “Southerners,” “North,” etc. were replaced by other, more precise terms: for instance, the “South” is not a single context, but many and heterogeneous ones.

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<sup>6</sup> Harding ([2008](#)) is one of the few authors to problematize this issue, in a note at the end of her book, although, unfortunately, she then uses them quite frequently, possibly for the convenience of using concepts deeply rooted in academic common sense. To be fair, I have to say that much of the book strives to refute them.



The second problem concerns each of the above categories. Let us look then at each one in particular. The notions of “South” and “North” and “West” and “East” come from a wildly inaccurate geographical analogy and are the product of discourses developed and firmly anchored in old-school Eurocentrism. Their use, therefore, in enlisting so-called “postcolonial” practices is nonetheless paradoxical. Strictly speaking, Tunisia, Guatemala, the Philippines, and Thailand are in the Northern Hemisphere, while Australia and South Africa are in the Southern Hemisphere.

What to say about the use of “West”? Few notions seem vaguer, because, going by the Greenwich meridian, Senegal and Mauritania would be “West,” while Sudan and Kenya would be “East.” Japan too is “East,” while Latin America would be “the Far West,” (*extremo occidente*, in Spanish) as the historian Alain Rouquié has called it ([Rouquié 1989](#)). If what we want to talk about are the consequences of the Scientific Revolution in the northern European countries from the seventeenth-century onward, it would be more precise to refer—as rigorous historians like Lewis Pyenson ([1985](#)) have—to the expansion of German physics, French chemistry, and so on. Or, more precisely, certain schools within each of these disciplines. If we defend pluralism, we must not betray it with concepts.

Naturally, we must recognize that any concept that attempts to identify a set of common topics across diverse contexts would be certainly problematic. This is precisely why, in an explicit vindication of the locality of scientific knowledge and pluralism, I suggest avoiding these large theoretical aggregates and replacing them with ad hoc categories that highlight, in each case, what emerges as the substantive variable of each study. This must be combined, however, as I will try to show below, with other categories that account for global dynamics and structural aspects.

### **Movement: How STS Concepts Travel**

Anderson has been one of the authors to have made extremely interesting contributions when it comes to complexifying all this knowledge, all these actors, that seemed submerged—or invisible—to traditional STS studies, conceptualizing them in a postcolonial light. One of his anchor points is to view Actor-Network Theory (ANT) as providing important elements to break with traditional analytical models. He points out that:

It [ANT] added another challenge to the facile diffusionism of most modernization theory, deconstructing its arguments in favour of shared cognitive norms and institutional relationships, and *dissolving fatuous distinctions between centre and periphery* ([Anderson 2009, 391](#), author’s emphasis).

This is the kind of operation I consider chancy. Anderson starts by reasonably questioning the traditional models, who, like Basalla’s followers, thought about radiating central and receiving peripheral contexts. This model, as we know, has been challenged on many fronts for several decades. It is, however, novel to use ANT to break with these models, as this approach presents various problems when accounting for issues that are by nature global. Let us take a brief look at these problems.

First, there was a clear change in the level of analysis. This is something that in social studies should not be naturalized.<sup>7</sup> Above, I disputed the large aggregate concepts, like “developing countries,” which lose heuristic value. At the other extreme, many microstudies, or studies limited to specific network trajectories, do not take into account the structural dimensions. Second, ANT, with its principle of extended symmetry, has tended to allow little room for power relations that go beyond the bounds of the networks analyzed. And the analysis of a globalized world and the asymmetries present in it seem to escape that analysis. Third, ANT has historically omitted the role of institutions, as studied by various sociological traditions.

This is certainly not the place to rekindle a debate about ANT that has been going on for decades.<sup>8</sup> However, the question that most matters to me is that the use of ANT to break with the old categories leads us to a liquid world where asymmetries are dissolved in the absence of stable categories, and their structural character is concealed. Anderson (2009) seems to point to this by stating the need to creatively supplement the conventional distinctions between center and periphery, the modern and the traditional, the dominant and the subordinate, the civilized and the primitive, the local and the global.

Here, the risk is that, by falling back on ANT, rather than complexifying these distinctions, they will simply dissolve. To be fair, in his numerous texts on the subject, Anderson manages to avoid the dissolution of such asymmetries, referencing, among other concepts, “trading zones,” as well as “the localness of technoscientific networks,” or the “situated production” of “globality” (Anderson 2009, 395). But even so, I still see issues that escape the analysis.

### **Centers: Latin American Participation in European Projects**

We have seen that investigations on “situated” knowledge arising several decades ago in response to the universalist conception of science displayed certain “failures”: they focused primarily on the technosciences of the most developed countries and centers, and ignored the knowledge produced in non-hegemonic contexts as equally valid. As I point out above, several authors draw attention to this issue, notably Harding (2008, 2011, 2016), Anderson (2002, 2009, 2017), McNeil (2005), Law and Lin (2017), Dumoulin et al. (2018), and others. These criticisms often fall within postcolonial perspectives, where they are grounded in a critique of Eurocentrism (or “Euro-Americanism”) and the need to: (a) observe “other” modes of knowledge production in “other” subjugated, ignored, or dominated contexts or regions; (b) understand how these other forms of technoscientific knowledge can be as valid as standardized forms of “Western science” and

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<sup>7</sup> Latour himself explains how ANT seeks to break with the fiction of the level of analysis that has historically been used in sociology: “Small scale/large scale: the notion of network allows us to dissolve the micro-macro distinction that has plagued social theory from its inception. The whole metaphor of scales going from the individual to the nation state, through family, extended kin, groups, institutions etc. is replaced by a metaphor of connections.” (1996, 371).

<sup>8</sup> See Collins and Yearley (1992), Sismondo (2004), and the responses of Callon and Latour (1992), or Latour (1996), to quote but a few references. See also Harding (2008).

as expressions of alternative epistemologies; and (c) show that the Western and/or Northern world could learn from these other technoscientific cultures.

This set of initiatives, indeed, implies a phenomenal advance compared with the morphology shown by the STS field a few years ago, and various initiatives demonstrate that the issue is part of a certain collective imaginary. To the aforementioned events of the trilingual Meeting held in Buenos Aires (2014) and the award of the Bernal Prize to Hebe Vessuri we must add the central issue of the 4S congress in Sydney in 2018 (Transnational STS), and the exhibition at that same event of “STS Across Borders” and others. These are initiatives that stimulate the inclusion of STS practitioners from different regions, while seriously confronting the challenge of opening eyes that had long been auto centric.

I believe, however, that, in spite of such advances, we still have a long way to go. Ariel Heryanto (2016) highlights two issues, which I think are crucial: first, a division of labor—which I mentioned at the start of this article—in which hegemonic centers are the ones that mostly produce theory; second, peripheral spaces, which conduct almost exclusively empirical work. I have presented these dynamics—in fact, it has been at the center of my work for several years—in the case of the “hard” sciences: molecular biology (Kreimer 2010), biomedical research in general (Kreimer 2016), the sequencing of various genomes (Kreimer 2022).

To take just one example, in the study we conducted on Latin American participation in European projects, where we analyzed 16 large research consortia in “environmental,” “health,” and “knowledge base economy” issues (Feld and Kreimer 2019), we found that: (a) the participation of Latin American scientists was not an “accident,” but their participation was very important, and was intensely sought after by European leaders; (b) elite Latin American scientists were invited to join the consortia, once the research agendas were already firmly established, as well as the theories and methods to be used; c) most of the activities carried out by the Latin American groups (more than 80 percent) were defined as “data collection,” “data processing,” or “highly sophisticated technical tasks,” while less than 10 percent referred to “idea generation” or “theoretical production.” On the other hand, the motivations for involving Latin American scientists were mostly related to access to natural resources, specific local knowledge, or the ability to conduct trials (clinical, crop, etc.).

There is no room here to develop relevant data belonging to other fields and countries, but I must say—reflexively—that an analogous phenomenon occurs in the social sciences, and especially in STS, as Law and Lin (2017) have already noted. Certainly, this division of labor does not take place in mega-research consortia as in the hard sciences, but it can be observed in the distribution of publications according to the origin of the authors in the most important journals of the STS field at the international level (Invernizzi et al. 2022): the papers coming from non-hegemonic contexts concentrate mostly on case studies, duly justifying their object of observation, and adopt or adapt mainstream theories and methods, with very little novel theoretical content.

Second, the issue of language. As both Heryanto, Law and Lin point out, like many other fields, STS continues to be dominated by the English language. But, as several authors have already shown, this domination is not merely linguistic: language determines ways of thinking, of conceiving the issues, of arguing, and of relating to each other. Ortiz (2009) notes that the very concept of “globalization” could only have arisen in English and is conjugated in English, and not in other languages.

Law and Lin (2017, 222) make a fine proposition based on the fact that “our terms of art might not come only from English–language Euro–America, and to think about STS in ways that are indeed Chinese, Spanish, and Hindi inflected.” They feel that “if we do succeed, then we will have created a plurality of intersecting STSs and sensibilities, and we will be able to say that we have undone the provincialism of STS.” (ibid.).

I believe this is important, but it is not sufficient. We need to reopen the discussion of the issue around the level of analysis and the limits of our research. As soon as we explore the most appropriate level of analysis to answer our questions, if we keep in mind this new schema of sensitivities, we will see that asymmetries are present and that this should form part of our theoretical framework (whichever we choose) and our methods. This involves designing the right methodological—and linguistic—tools to capture these sensibilities.

For instance, as I recently proposed (Kreimer 2019), we can agree that the level of a field, or, better yet, a sub–field or specialty, is a sufficiently broad level to understand the dynamics of production, circulation, negotiations and uses of knowledge in a given locus. It is also sufficiently limited so that the type of practices observed within this field have a minimum degree of homogeneity that prevents us from making broad generalizations. Thus, as soon as we define that field in a semi–peripheral context, for example, the dynamics of nanosciences in Venezuela (López Cadenas, Hasmy, et al. 2011), of molecular biology in Argentina (Kreimer and Lugones 2002), of nuclear physics in Brazil (Ribeiro de Andrade and Muniz 2006), or of biomedical sciences in Mexico (Torrens 2018), we must immediately put it in context of the dynamics of that field at the international level. This is due to a double determination: on the one hand, because those fields or specialties cannot be understood detached from what happens in the rest of the world: those elites are inserted in a global field that provides a sense and a legitimacy, on which they depend and which they influence. There are also “global research agendas” that steer and orient the production of knowledge, including the growing role of funding agencies (Audétat 2015). On the other hand, because these objects, as we pointed out at the beginning of this article, must be justified, they are not self–evident. And, immediately, in this analysis, asymmetries emerge, independently of the theoretical devices we use. This asymmetry, of course, encompasses the “hard” objects of science in these contexts, but it also affects those who study them, since their position, in defining these objects of study, also becomes *peripheral*.

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