INTRODUCTION

Opening Up the Canon of Knowledge and Recognition of Difference

Boaventura de Sousa Santos, João Arriscado Nunes, and Maria Paula Meneses

The main argument of this book is that there is no global social justice without global cognitive justice. Probably more than ever, global capitalism appears as a civilizational paradigm encompassing all domains of social life. The exclusion, oppression, and discrimination it produces have not only economic, social, and political dimensions but also cultural and epistemological ones. Accordingly, to confront this paradigm in all its dimensions is the challenge facing a new critical theory and new emancipatory practices. Contrary to their predecessors, this theory and these practices must start from the premise that the epistemological diversity of the world is immense, as immense as its cultural diversity and that the recognition of such diversity must be at the core of the global resistance against capitalism and of the formulation of alternative forms of sociability (Santos, 2006b).[1]

Over the last decades, there has been a growing recognition of the cultural diversity of the world, with current controversies focusing on the terms of such recognition. But the same cannot be said of the recognition of the epistemological diversity of the world, that is, of the diversity of knowledge systems underlying the practices of different social groups across the globe. However, from an anti-capitalist perspective such recognition is crucial. The epistemological privilege granted to modern science from the seventeenth century onwards, which made possible the technological revolutions that consolidated Western supremacy, was also instrumental in suppressing other, non-scientific forms of knowledges and, at the same time, the subaltern social groups whose social practices were informed by such knowledges. In the case of the indigenous peoples of the Americas and of the African slaves, this suppression of knowledge, a form of epistemicide (Santos, 1998), was the other side of genocide. There is, thus, an epistemological foundation to the capitalist and imperial order that the global North has been imposing on the global South. This book aims at elucidating some of the destructive consequences of this

epistemology and at proposing an alternative epistemology that, far from refusing science, places the latter in the context of the diversity of knowledges existing in contemporary societies. Starting from the assumption that cultural diversity and epistemological diversity are reciprocally embedded, this book is intent to show that the reinvention of social emancipation is premised upon replacing the "monoculture of scientific knowledge" by an "ecology of knowledges" (Santos, 2003b; 2004a). The ecology of knowledges is an invitation to the promotion of non-relativistic dialogues among knowledges, granting "equality of opportunities" to the different kinds of knowledge engaged in ever broader epistemological disputes aimed both at maximizing their respective contributions to build a more democratic and just society and at decolonizing knowledge and power.

THE DIVERSITY OF CULTURES AND THE DIVERSITY OF KNOWLEDGES

Many non-Western (indigenous, rural, etc.) populations of the world conceive of the community and the relationship with nature, knowledge, historical experience, memory, time, and space as configuring ways of life that cannot be reduced to Eurocentric conceptions and cultures. For instance, the definition of the identity of peoples in the non-Western world and of their collective rights tends to be strictly bound to a notion of "territoriality" associated with responsibilities in relation to a territory, which is defined as a collective of spaces, human groups (including both the living and their ancestors), rivers, forests, animals, and plants. Differences between worldviews become explicit and turn into sites of struggle when the integrity of these collectives is threatened by alternative notions of relationships to territory and knowledges—such as those that are based on the right to property—or when the distinction between the respect for culture and the imperative of development is used to justify the exploitation of "natural resources" by outside forces. The struggle of the U'wa in Colombia against a petroleum multinational (this volume), or of the peasants and rural communities in India against the appropriation by multinational companies of the biological resources of the territories they inhabit and in defense of a balanced environment and a way of life that respects and preserves this environment (this volume), provide examples of how confrontations between different worldviews can take the form of cultural, legal, and political conflicts on national and international levels.

The adoption of allegedly universally valid, Eurocentric legal and political models, such as the neoliberal economic order, representative democracy, individualism, or the equation between state and law often rests, as the different case studies in this book show, on forms of domination based on class, ethnic, territorial, racial, or sexual differences and on the denial of

collective identities and rights considered incompatible with Eurocentric definitions of the modern social order. Yet, even within Eurocentric normative frameworks, there is still scope for the right to difference to be affirmed, through conceptions of normality, nature, and morality that are alternative to the dominant ones.

Conceptions of knowledge, of what it means to know, of what counts as knowledge, and how that knowledge is produced are as diverse as the cosmologies and normative frameworks alluded to above. All social practices involve knowledge. The production of knowledge is, in itself, a social practice and what distinguishes it from other social practices is its self-reflexivity, which productively reshapes the context of practices in motive and engine of actions.

Self-reflexivity, viewed as the discovery of hetero-referentiality, is the first step towards the recognition of the epistemological diversity of the world. The latter, in turn, is inseparable from the diversity of cosmologies that divide and organize the world in ways that differ from Western cosmology and its offshoot, modern science. Both the proposals for radicalizing democracy—which point towards post-capitalist horizons—and the proposals for decolonizing knowledge and power—which point towards post-colonial horizons—will be feasible only if the dominant epistemology is subject to a critique allowing for the emergence of epistemological options that give credibility to the forms of knowledge that underlie those proposals.

These different expressions of diversity are often subsumed under the term "multiculturalism," a term that, like many others that have emerged from the critical discourses in/of modernity, has become a contested word with a variety of meanings and uses.

Multiculturalism: a contested concept

Especially after the 1980s, the humanities and the social sciences converged on the transdisciplinary area of cultural studies, considering culture as a phenomenon associated with repertoires of meaning or signification shared by members of a society, and also with differentiation and hierarchy within national societies, local contexts, and transnational spaces. Culture therefore became a central strategic concept in the definition of identities and alterity in the contemporary world, a resource for the affirmation of difference and the demand for its recognition, as well as a field of struggle and contradiction (McClintock, 1995; Werbner and Ranger, 1996; Spivak, 1999; Mosquera, Pardo, and Hoffman, 2002). As a consequence, the concept of multiculturalism became equally controversial and riddled with tensions. It stands, either simultaneously or alternatively, both for a *description* and a *project* (Stam, 1997). As a description, it may refer to: 1) the existence of a multiplicity of cultures in the world; 2) the coexistence of diverse cultures within the same

political space; 3) the existence of cultures that influence each other, both within and outside the geo-political space of the nation-state.[2]

Inasmuch as multiculturalism, as a description of cultural differences and the ways in which they interrelate, has superimposed itself on multiculturalism as a political project that celebrates or recognizes these differences, it has given rise to criticisms and controversies, both from conservative sectors and from different progressive and left-wing currents. Conservative critiques have resonated in the USA and Western Europe as responses to a complex set of social, cultural, and political transformations, such as: changes in the ethnic composition of their populations as a result of the increased presence of immigrants, especially the large contingents of illegal immigrants from Latin America, in the case of the USA, and from Africa, in the case of Europe; social programs of affirmative action aimed at excluded or marginalized groups, such as African Americans, Native Americans or Hispanics in the USA; the development of cultural studies and women's studies programs within the university and the subsequent transformations of the curricula of traditional fields such as literature, aimed at giving a presence and a voice to women and to minorities; some public policies supporting the cultural production of minorities; the diversity of social critiques of the hegemonic role of Western science; and, finally, the emergence, in the public space, of movements promoting a politics of identity based on the recognition of difference. Stam (1997) summarizes these conservative critiques under the following four points: a) multiculturalism is anti-European, since it seeks to replace the values and achievements of Western civilization with an uncritical promotion of "inferior" achievements; b) multiculturalism promotes disunity and division, thus fragmenting society and threatening the cohesion and unity of national goals; c) multiculturalism is a "therapy for minorities," aimed at promoting their self-esteem in the face of their manifest inability to perform adequately within the educational system and within society as a whole; d) multiculturalism represents a kind of "new Puritanism" supported by the policing of language and the totalitarian imposition of "politically correct" speech.

Some progressive responses to this picture underline the anti-Eurocentric (but not anti-European) nature of multicultural projects that promote the recognition and visibility of cultures that have been marginalized or excluded from Western modernity. Such projects recognize cultural differences, historical experiences, and intercultural dialogue in order to forge political alliances and coalitions supporting subaltern cultures and groups; they promote historical and cultural counter-perspectives in order to produce a relational history that includes subaltern groups; they also argue that examples of political correctness occur in all sectors of society and all shades of the political spectrum but that they are only attacked when they are associated with the defense of equality or the recognition of difference.

However, the response of the progressive sectors to multiculturalism is neither unanimous nor peaceful. The reason for this lies in the diversity of the cultural and political projects that describe themselves as multicultural, and in the different geopolitical and spatial environments in which they operate (whether North or South, local, national, global, etc.). The main progressive criticisms of multiculturalism may be grouped as follows:

1. The concept of multiculturalism is Eurocentric, created to describe cultural diversity within the framework of the nation-states of the Northern hemisphere and to deal with situations resulting from the flow of immigrants from the South into a European space without internal borders, the ethnic diversity and affirmation of the identity of minorities in the USA and the specific problems of countries like Canada, with territorially differentiated linguistic or ethnic communities. The North has sought to impose this concept on the countries of the South as a means of defining their historical condition and identity. This entails the "exporting" or "traveling" of concepts or analytical frameworks that remain bound to Eurocentric intellectual domination. In the South, the concept is associated with the rhetoric and political agenda of states, often with the aim or result of legitimizing oppressive or exclusionary forms of communalism, sometimes linked to religious fundamentalism (as in India). The multiplicity of adjectives employed in relation to multiculturalism, which has been variously described as "liberal," "authoritarian," "corporate," "insurgent," "boutique," "critical," "aggregate," "universalist," "essentialist," "paradigmatic," and "modular" points to the fact that it is a concept that has no precise content and is not necessarily associated with emancipatory perspectives or projects (Bharucha, 2000: 10).

2. Multiculturalism is the prime expression of the cultural logic of multinational or global capitalism (a capitalism "without a homeland," at last) and of a new form of racism,

> which empties its own position of all positive content (the multiculturalist is not a direct racist, he doesn't oppose to the Other the *particular* values of his own culture), but nonetheless retains his position as the privileged *empty point of universality* from which one is able to appreciate (and depreciate) properly other particular cultures—the multiculturalist respect for the Other's specificity is the very form of asserting one's own superiority. (Zizek, 1997: 44)

3. Multiculturalism tends to be "descriptive" and "apolitical," thus suppressing the problem of power relations, exploitation, inequality, and exclusion (the "United Colours of Benetton" model). The notion of "tolerance" does

not demand any active involvement with others and reinforces feelings of superiority among those who speak from a self-defined site of universality.

4. In the cases where it does occur, the politicization of multicultural projects takes place within the framework of the nation-state as a special status conferred on certain regions or peoples whose collective existence and collective rights are recognized only as subordinate to the hegemony of the constitutional order of the nation-state (and only while compatible with established notions of sovereignty associated rights, especially with property rights, such being the case of the conflicts surrounding the access to and the privatization of natural resources in Africa, Asia, and Latin America). In this context, Gunew stresses the need to differentiate between "*state multiculturalism, dealing with the management of diversity, and critical multiculturalism, used by minorities as leverage to argue for participation, grounded in their differences, in the public sphere*" (Gunew, 2004: 16). In this latter sense, multiculturalism contributes towards a post-colonial analysis of cultural encounters.[3]

5. Within cultural and post-colonial studies, the concept of multiculturalism tends to be dealt with through a focus on mobility and migration, with an emphasis on intellectuals, while ignoring forced or subordinate mobility (refugees, migrant workers, or returned emigrants) or those who have not moved but have been subjected to the effects and consequences of translocal cultural, economic, and political dynamics. This focus is evident both in the post-colonial theories of hybridization (Bhabha, 1994) and in the emphasis placed on the use of literature and other "expressive" cultural forms that can be studied drawing on Eurocentric academic disciplines. This privilege awarded the "migrant condition" denies the specific histories of migrations and, furthermore, ignores the "individuals and communities that resist migrancy on the basis of other loyalties and bonds to family, tradition, community, language, and religion that are not always translatable within the norms of liberal individualism" (Bharucha, 2000: 7).[4]

6. Finally, it is possible to question the relevance of terms such as culture or multiculturalism in describing and characterizing specific contexts and experiences that involve distinct ways of viewing and dividing up the world and for which the notion of culture or the division between the cultural, the economic, the social, and the political is not relevant. This criticism raises the problem of the "strategic" use of hegemonic concepts, which may often have the effect of reaffirming the very colonial imposition it opposes.

The tensions and criticisms presented above stress the importance of specifying the conditions under which multiculturalism as a project can

take an emancipatory content and direction. Emancipatory versions of multiculturalism are based on the recognition of difference, and of the right to difference and the coexistence or construction of a common way of life that extends beyond the various types of differences. These conceptions of multiculturalism are linked, in general, as Edward Said has noted (1994), to "overlapping territories" and "intertwined histories," the products of the dynamics of imperialism, colonialism, and post-colonialism, which have put metropoles and dominated territories in contact with each other (Memmi, 1965), and which have created the historical conditions of diaspora and other forms of mobility (Anderson, 1983; Clifford, 1997). The idea of movement, the articulation of difference, and the emergence of cultural configurations based on contributions from specific experiences and histories have led to the exploration of the emancipatory possibilities of multiculturalism, thus fuelling debates and initiatives involving new definitions of rights, identities, justice, and citizenship. However, the relationship between the conditions that make these forms of mobility and hybridization possible and the dynamics of the capitalist world-system that produce, reproduce and increase inequality, marginalization and the exclusion of important sections of the world's population, in the North as well as in the South, are not always made explicit. For some proponents of emancipatory versions of multiculturalism, the relevance of culture lies in the fact that, in the era of global capitalism, it is the privileged arena for the articulation of the reproduction of capitalist social relationships and antagonism towards them, "the field on which economic and political contradictions are articulated" (Lowe and Lloyd, 1997: 32).

The viability of an emancipatory cosmopolitan politics calls for adequate responses to two kinds of problems which the transformations of global capitalism have brought to emancipatory struggles and to the production of knowledge relating to them. First, the multidimensionality of forms of domination and oppression gives rise, in turn, to forms of resistance and struggle that mobilize different collective actors and (not always mutually intelligible) vocabularies and resources, and this can place serious limitations on attempts to redefine the political arena. Second, since the majority of these struggles are local in origin, their legitimacy and effectiveness depend on the ability of collective actors and social movements to forge translocal and global alliances, which presuppose mutual intelligibility. The answer to these two problems cannot be accounted for by any general theory of society or of social transformation, as the latter tends to be situated in and respond to a particular social and cultural context. A politics of cultural diversity and mutual intelligibility calls for a complex procedure of reciprocal and horizontal translation rather than for a general theory. According to Boaventura de Sousa Santos,

> because there is no single principle of social transformation, it is not possible to determine, in abstract, the articulations or hierarchies among the different social experiences and their conceptions of social transformation. Only by means of the mutual intelligibility of practices is it possible to evaluate them and identify possible alliances among them. (2004a: 182).

This theory of translation allows common ground to be identified in an indigenous struggle, a feminist struggle, an ecological struggle, etc., without erasing the autonomy and difference of each of them. Translation is also fundamental to the articulation between the diverse and specific intellectual and cognitive resources that are expressed through the various modes of producing knowledge about counter-hegemonic initiatives and experiences, aimed at redistribution and recognition and the construction of new configurations of knowledge anchored in local, situated forms of experience and struggle. To achieve these aims, it is crucial to mobilize and prioritize concepts or forms of knowledge—such as the modern sciences, including the social sciences, and the humanities—that were originally elaborated in an Eurocentric context. This allows the biases associated with these concepts to be exposed and alternative concepts based on strategies such as diatopical hermeneutics or reconfigurations of knowledges based on the mutual recognition of their partiality and incompleteness to be proposed (Santos, this volume). Their adequateness in different situations, experiences, and struggles has to be evaluated pragmatically; it is not possible to determine the "intrinsic" superiority of any one strategy over another. Taken as a whole, these responses represent a set of critical or emancipatory versions of multicultural projects, opposed to the apolitical nature of celebratory multiculturalisms. We shall encounter different uses of these in the case studies included in this volume.

The procedures of translation, articulated with what Boaventura de Sousa Santos (2004a) calls "the sociology of absences," are important resources for preventing the reconstruction of emancipatory discourses and practices from falling into the trap of reproducing, in a wider form, Eurocentric concepts and concerns. As in the debate on human rights, it is important here as well to identify the concerns and concepts that correspond to those that, in the West, endow notions such as "culture," "multiculturalism," "rights," "citizenship," "science," or "knowledge" with an emancipatory content. The strategic and emancipatory use of these concepts depends on the recognition of the variety of situated knowledges that have often been marginalized, silenced, or destroyed by the hegemony of Western science and technology (see Visvanathan, Meneses, and Xaba in this volume).

The idea of "multicultural citizenship" acquires a more exact meaning as the privileged site of struggles for the mutual articulation and activation of

recognition and redistribution.[5] This is the path to the proliferation of local public spheres that are, at the same time, able to establish translocal connections, sometimes with and sometimes against the national states, as nodes of counter-hegemonic forms of globalization, emancipatory global subpolitics, and genuinely cosmopolitan citizenships. The chapters by Shalini Randeria, Carlos Marés, Lino Neves, and Luis Carlos Arenas illustrate from different perspectives the difficult paths towards the recognition of both the principle of equality and the principle of recognition of cultural difference and its translation into a politics of multicultural collective rights, particularly when the control over natural resources, such as those existing in indigenous peoples' territories, is at stake. In the African context, the question is also raised in the chapter by Borges Coelho when he discusses the role of knowledge in the process of shaping local, ethnic identities.

The debate on the universality or multiculturalism of human rights illustrates a more general problem: that of knowing how to make commensurate demands for human dignity, formulated in different languages of rights and justice. The wider the circle of reciprocity, as defined by a given conception of rights and justice, the better it will be able to include diverse actors, dialogues, and conceptions. The successes of the indigenous movements in Brazil and of the U'wa in Colombia in mobilizing translocal and transnational solidarity provide exemplary illustrations of the importance of broad circles of reciprocity. The language of culture and multiculturalism is mobilized, in these situations, as a fundamental strategic resource and as a means of making claims for difference mutually intelligible and shared.

As the case studies in this volume show, policies to integrate the indigenous populations of Brazil and Colombia within liberal citizenship, as autonomous individuals "free" of collective bonds, have signified in practice the denial of their collective rights, the right to their territory, to their way of life, and to their cosmologies. For the case of Brazil and Colombia these collective rights have come to be recognized and affirmed through their struggles to inscribe a multicultural constitutional order in the 1988 and 1991 Constitutions, respectively. As the case of India suggests, the legal pluralism that results from the intersecting dynamics of the global, the national, and the local can create spaces for the recognition of alternative forms of normativity, but these can only effectively result in emancipatory dynamics in articulation with alternative conceptions of justice and redistribution policies aimed at the most vulnerable and subaltern groups in the population. The demand for the recognition of local identity can be mobilized in order to demand equal treatment for citizens within the same country. In other contexts, such as the case of the U'wa in Colombia, the affirmation of identity is a resource for demanding recognition of collective rights, associated with an effective guarantee of control over a territory and its

resources. However, identity discourses can also be used to impose repressive orders, based on a precarious peace enforced by arms, invoking the so-called harmony of a pre-modern past. The answer to these tensions and dilemmas proposed by Boaventura de Sousa Santos (this volume) is to defend equality whenever difference generates inferiority and to defend difference whenever a call for equality implies a threat to or a loss of identity.

The struggles of the indigenous peoples of Latin America have drawn attention to a crucial point: these struggles owe their success and their endurance to their ability to forge alliances between different peoples and ethnic groups, other social movements, non-governmental organizations (NGOs), and international solidarity movements. The consolidation of struggles for collective rights and for justice on a local scale depends, on the one hand, on mobilizing the national state as a guarantor of these rights and, on the other hand, on transnational solidarity. In many circumstances, alliances with sectors of the state (exploiting its tensions and internal contradictions) or the mobilization of judicial power may make all the difference between a successful and an unsuccessful struggle. To the extent that the processes of globalization generate definitions of rights on varying scales that affect the local definition of rights, resorting to international legal instances may be highly relevant to the success of local emancipatory alliances.

Alternative, counter-hegemonic globalization is based on the construction of emancipatory citizenships that articulate the local and the global through networks and polycentric coalitions. If the safeguard of the emancipatory nature of the struggles carried out at a local level requires that the direction and coordination of these struggles remain in the hands of local actors, then translocal and transnational alliances and the creation of international networks of information and active solidarity are an indispensable condition for preventing these struggles from becoming too localized and particularistic.

THE CRITIQUES OF SCIENCE AND THE PLURALITY OF KNOWLEDGES

Some of the recent epistemological and political debates that have cut across the sciences and the transdisciplinary field known as "science studies" have displayed concerns that intersect or parallel many of the themes mentioned above. The questioning of the hegemonic conception of modern scientific knowledge, especially from the South and, in particular, during the last decades of the twentieth century, had significant consequences for all disciplines, not least for the social sciences (Santos, 1995, 2004a; Guha and Martinez-Alier, 1997; Visvanathan, 1997; Prakash, 1999; Escobar, 1999; Masolo, 2003). In the North, the debate drew as well upon Western traditions of philosophy and history of science and developed in two

directions: one, which we could describe as "internal," questions the monolithical character of the epistemological canon and asks for the epistemological, sociological, and political relevance of the internal diversity of scientific practices and of the different ways of doing science; the other direction questions the epistemological exclusivism of science and focuses on the relationships between science and other knowledges, what we shall call the external plurality of science. Feminist and post-colonial critiques of conventional epistemologies have played a central role in both debates.

The internal and external plurality of modern science

The question of the *internal plurality of science* was raised, in the West, primarily by feminist epistemologies,[6] by social and cultural studies of science and by the currents in the history and philosophy of science influenced by the latter.[7] These approaches displayed the dependence of scientific research as an activity on the selection of topics, problems, theoretical models, methodologies, languages, and images and forms of argument; they studied, through historical and ethnographic research, the material cultures of the sciences,[8] the different ways in which scientists related to institutional contexts, to their peers, to the state, to funding agencies and entities, and to economic interests or to public interest; they highlighted the central significance of the conception of knowledge as a construction, as the interaction, through socially organized practices, of human actors, materials, instruments, ways of doing things, and skills, in order to create something that did not exist before, with new attributes, not reducible to the sum of the heterogeneous elements mobilized for its creation; and, finally, they scrutinized the conditions and limits of the autonomy of scientific activities, displaying their connections to the social and cultural context where they are carried out. Through their analyses of the heterogeneity of practices and of scientific narratives, these approaches exploded the presumed epistemological and praxiological unity of science and turned the opposition of the "two cultures" (of the sciences and of the humanities), as a structuring feature of the field of knowledge, into a rather unstable plurality of scientific and epistemic cultures and configurations of knowledges.[9] The recent episodes of the so-called "science wars" can be understood, according to this view, as an attempt at reasserting that divide and re-establishing and policing the boundaries of different domains of knowledge and their hierarchy.[10]

As the aforementioned studies have shown, the differentiation and specialization of the sciences are the outcome of historical changes associated with two processes. The first is the drawing of boundaries between science and technology, which often is still used to claim the intrinsic neutrality of science and locate the consequences of scientific research—be such con-

sequences desirable or undesirable, good or bad, constructive or destructive—on its applications. The changes undergone over the last decades by the organization of scientific knowledge and its relationship to technological innovation and development have led, though, to significant reassessments of the historical record of that divide, which showed evidence of many situations in the past in which technological innovation and development were inseparable from the activity of scientific research itself. The widely used expression "technoscience" was proposed as a way of describing the impossibility of a radical differentiation of science and technology, stressing their mutual implication, as Laymert Garcia dos Santos points out in his chapter.[11]

The second process consists of the demarcation of science from other modes of relating to the world, taken to be non-scientific or irrational, including the arts, humanities, religion, and different versions of that relationship to the world which, paraphrasing Marx, confounds essence and appearance or, as Durkheim would say, allows collective life to rest upon "well-founded illusions," known as common sense. The assertion of the discontinuities of science and its "others" requires, as Gieryn (1999) has shown, a permanent commitment to boundary work, a ceaseless policing of borders and a persistent epistemological vigilance, in order to contain and repel the always allegedly imminent assaults of irrationality. This boundary work, however, had to face a number of obstacles, namely the very difficulty of dividing scientific knowledge and the objects of science from those that "belonged" to other domains of culture or to the vaguely defined territory of "opinion." The latter always had an ambiguous status in the history of the sciences, being regarded either as the "other" of science, which had to be denounced, demystified, and defeated in the name of rigor and reason, or as the "natural" ally of science, the obligatory point of passage for a transformation of the world according to the principles of reason and the Enlightenment.

But the sciences are themselves internally "disunified" (Galison and Stump, 1996). The attempt at reducing science to a single epistemological model inspired by Newtonian mechanics and based on mathematization as the ideal of scientificity was belied by a diversification of situated practices coexisting and/or intertwined in an "ecology of practices," hosting distinctive epistemological models, and which has been the object of social studies of science for the last three decades. The recognition of the principles that legitimated the different practices constituted as sciences led not only to the claim of a diversity of models of scientificity but to tensions between these models within the sciences themselves. The different ways in which that constitutive distinction of modern science, of subject and object, is enacted within different disciplines and scientific domains is another marker

of the "disunity" of the sciences. The particular circumstances and conditions of the production of knowledge are crucial for assessing the difference that knowledge makes and how boundaries and demarcations work as modes of making autonomous and legitimating distinctive fields of practices, without their submission to "foreign" epistemological models, or, conversely, how the transgression of boundaries allows the emergence of new disciplines or research domains, as illustrated by the history of the life sciences or of the environmental sciences.[12]

Epistemological diversity is neither the simple reflection or epiphenomenon of ontological diversity or heterogeneity nor a range of culturally specific ways of expressing a fundamentally unified world. There is no essential or definitive way of describing, ordering, and classifying processes, entities, and relationships in the world. The very action of knowing, as pragmatist philosophers have repeatedly reminded us, is an intervention in the world, which places us within it as active contributors to its making. Different modes of knowing, being irremediably partial and situated, will have different consequences and effects on the world. The very capacity of the modern sciences to create new entities and in this way to enact an ontological politics (Mol, 2002)—with the effect, intentional or not, of increasing the heterogeneity of the world—seems to support this conception. It gives shape to a robust realism and to a strong objectivity, a clear awareness of the need to accurately and precisely identify the conditions in which knowledge is produced and its assessment on the basis of its observed or expected consequences. This allows a rigorous account of the situatedness, partiality, and constructedness of all knowledges, while rejecting relativism as an epistemological and moral stance.[13]

That which exists—knowledge, technological objects, buildings, roads, cultural objects—exists *because* it is constructed through situated practices. The relevant distinction, as Latour reminds us, is not between the real and the constructed, but between that which is well constructed, which successfully resists the situations in which its consistency, solidity, and robustness are put to the test, and that which is badly constructed, and hence vulnerable to criticism or erosion. This is the difference that allows a distinction to be made between facts (well constructed) and artifacts (badly constructed).[14]

To produce knowledge is to accept the risk of putting to the test our beliefs and our ignorance without reducing what we do not know to what we already know and without dismissing as irrelevant what we cannot describe because we ignore it, but it is also to exercise prudence and precaution when dealing with the unknown or with the possible consequences of our actions.

This quick expedition into the "disunity" of the sciences suggests that the opposition of the two cultures, of the humanities and the sciences, is

inadequate to account for the differentiation of the practices of knowledge-production and for the organization of knowledges, even in the context of modern Western societies. The emergence of post-colonial epistemological discourses showed how that opposition was constituted as an artifact of Western academic tradition, an outcome of the specific parameters that bounded the process of acculturation of science and the differentiation and hierarchization of knowledges (Alvares, 1992; Santos, 2004a).

Feminist criticism, in turn, has provided some of the most powerful resources for the criticism of the monoculture of knowledge based on modern science and, in particular, of the way it has historically excluded or marginalized certain subjects, such as women.The influence of women's movements and of the different currents of feminism on the growth of the participation of women in the academic world and in the worlds of science is well established.[15] There is less agreement on how this influence made itself felt. Schiebinger (1999) proposes a critical scrutiny of three paths to that influence: the participation of women in the production of science and in scientific institutions, including their access to advanced training, to jobs, and to career advancement; the changes in the culture of the sciences associated with that participation and with feminist critique, namely in shaping the organization of careers and of daily work, of the interactions between colleagues and between teachers and students, or the reorganization of the relationships between family life and occupational life; the change in the contents of knowledge itself in different disciplines and areas, in the definition of research topics, languages, images, research procedures, interpretation of results, and in the very definition of the boundaries between science and other forms of knowledge, allowing the recognition of practices associated, for instance, with local economic life, or with the local management of environment and health, usually performed by women, in a variety of social contexts.[16]

From the extensive body of literature on this subject, it is obvious that the consequences of feminist critique and of the debates over the science-gender link are, first, the denaturalization of the male dominance of modern science, sustained by a range of institutions, practices, and occupational ideologies; and second, the identification of the conditions associated with the constitution of knowledge subjects—not only gender, but ethnicity, class, nationality, or religion, to name only a few—and the consequent development of "strong" forms of objectivity, linked to the idea of the "positioned" or "situated" subject. Thus, feminist critique aims not to create a "separate" science but rather to contribute to changes in existing science, extending and renewing the critical horizon at the origins of modern science, incorporating new questions, perspectives, topics, and practices, in renewed institutional and occupational contexts, towards what Schiebinger (1999) describes as "sustainable science."[17]

Intercultural comparisons of Western science and other knowledge systems that have become localized (as traditional, native forms of knowledge) by the hegemonic force of Western science have brought new contributions to the debate, displaying continuities and disjunctions (Apffel-Marglin, and Marglin, 1990; Eze, 1997; Visvanathan, 2003; Escobar and Pardo; and Visvanathan, Meneses, and Xaba in this volume). This is where the discussion of the external plurality of knowledge, of the ways in which modern sciences have opened themselves to confrontation and dialogue with other forms of knowledge, has found an anchor.[18] In the light of this cultural critique of science it does not come as a surprise that Sarah Franklin (1995) defends "*science as culture*," or that Sandra Harding (1998) regards modern science itself as an ethnoscience, with a deep imprint of particular conventions, boundary work procedures, and values.

THE COLONIALITY OF POWER AND KNOWLEDGE

Post-colonial criticism has conceived the hegemony of Western science, after the end of the colonial era, as a form of "coloniality of knowledge and power" (Shiva, 1993; Ela, 1998; Quijano 2000; Lander, 2000). From the fifteenth century onwards, the constitution of the "modern/colonial world-system" (Wallerstein, 1979; Mudimbe, 1988; Dussel, 1994, 1995; Chakrabarty, 2000; Quijano, 2000; Mignolo, 2000; Mbembe, 2001) rested upon multiple "creative destructions," often carried out on behalf of "civilizing," liberating, or emancipatory projects, which aimed at reducing the understandings of the world to the logic of Western epistemology. Examples of this were the conversion of the knowledges of colonized peoples and of the diversity of their cultures and cosmologies to expressions of irrationality, of superstition, or, at best, to practical and local forms of knowledge whose relevance was dependent on their subordination to modern science, perceived as the sole source of true knowledge, or to religious conversion or acculturation; the subordination of their customs to the law of the modern state and of their practices to the capitalist economy; and the reduction of the variety of their forms of social organization to the state/civil society dichotomy (Meneses, 2005). This multifaceted reduction, despite its arbitrary origin, became a conceptual orthodoxy and was responsible for the subordination of the peripheral and semi-peripheral regions and countries of the world system, which were to be called, at a later historical moment, the Third World, and which we shall refer to as the global South (Santos, 1995: 506–519).[19] This denial of diversity is a constitutive and persistent feature of colonialism. While the political dimension of colonial intervention has been widely criticized, the burden of the colonial epistemic monoculture is still accepted nowadays as a symbol of development and modernity (Alvarez,

1992; Escobar, 1995; Visvanathan, 1997; Meneses, 2003). Post-colonial studies may be regarded as a means to deal with this burden and its consequences. They will be defined, for our purposes, as

> a set of theoretical and analytical currents, firmly rooted in cultural studies but also present today in all the social sciences, sharing an important feature: in their understanding of the contemporary world, they all privilege, at the theoretical and political level, the unequal relations between the North and the South. Such relations were historically constituted by colonialism, and the end of colonialism as a political relation did not carry with itself the end of colonialism as a social relation, that is to say, as an authoritarian and discriminatory mentality and form of sociability. (Santos, 2004b)[20]

The post-colonial critique of the epistemic foundations of Western academic discourse has triggered and nourished discussions on the possibilities of construction of an alternative to capitalism. Post-colonialism, as some critics argued, is hostile to the possibility of such an alternative, due to its criticism of unified and homogeneous categories such as class, gender, and nation-state. Because post-colonialism does not contemplate the possibility of a politics of emancipation, they argue, it transforms resistance into an individual act. Much of this debate rests on the meanings of post-colonialism, as well as on the ambiguities that distinct visions of history place upon this concept. Although the "post" in post-colonialism is indicative of the end of colonialism and imperialism as direct political dominance, it does not imply the demise of imperialism as a global system of hegemonic power. Not surprisingly, Homi Bhabha, following Nkrumah, regards the condition of post-coloniality as "a salutary reminder of the persistent 'neo-colonial' relations within the 'new' world order and the multi-national division of labour" (1994: 6). As McClintock argues (1995: 10), the "post" in post-colonialism seeks to capture the continuities, ruptures, and complexities of specific historical periods, and attempts to go beyond the strict unilinear chronological and dichotomous conceptions that dominate contemporary social and political thinking. In our view, a post-colonial perspective draws on the idea that the structures of power and knowledge are more visible from the margins. Hence its interest in the geopolitics of knowledge, its eagerness to problematize the equation of who produces knowledge, in what context, and for whom. In this context, the reflections of Ghandi (2000), Nkrumah (1965), Césaire (2000), Fanon (1963), or Memmi (1965), which laid the foundations of the history of violence and misunderstanding produced by capitalism and of a vibrant indictment of colonialism, are still of great relevance for the debate over the knowledge–power relation. As the studies in this volume illustrate in detail, the end of political colonialism did not

mean the end of colonialism as a social relationship associated with specific forms of knowledge and power, the coloniality of power and knowledge.

It is clear, nowadays, that beyond its economic and political dimensions colonialism had a strong epistemological dimension.[21] And when one considers the resilience of such dichotomies as nature/society, savage/civilized, developed/underdeveloped one must ask how much of the colonial past remains in the post-colonial present.

The production of the West as hegemonic knowledge required the creation of an Other, constituted as an intrinsically disqualified being, a collection of characteristics that were markers of inferiority towards the power and knowledge of the West and, thus, available for use and appropriation by the latter.[22] Colonial alterity as a space of inferiority took various shapes that reconfigured the already existing processes of manufacturing inferiority, based on sex, race, or tradition (Ranger, 1988; Schiebinger, 1989; Santos, 1995; McClintock, 1995). As a result, three resilient subaltern figures are still with us: the woman, the savage, and nature.[23]

Many alternative forms of knowledge were destroyed and the social groups that relied on them to pursue their own and autonomous paths of development were humiliated, all in the name of modern science (Dussel, 2000: 49–50). Whatever the epistemological merits of modern science and their admittedly positive or, at least, benign effects, the self-constitution of science as a universal form of knowledge that claims the right to legislate over all other forms of knowledge leads to it being frequently regarded in the non-Western world as a Western particularism whose specificity consists of holding the power to define as particular, local, contextual, and situational all knowledges that are its rivals.

One of the most important events of the colonial intervention from the late seventeenth century to the early twentieth century was the invention of the "savage" as an inferior being and the promotion of the idea of scientific and technological progress as imperative to achieve the highest stage of development—Western civilization. This creation of the other as a being devoid of knowledge and culture—"*Historically, Africa is not part of the world; it cannot show evidence of any movement or development. The historic movements it displays—on the Northern region of the continent—belong to the Asian and European world*" (Hegel, 1970: 193)—was the counterpoint of the colonial requirement of transporting civilization and wisdom to peoples who lived in the dark recesses of ignorance. The segmentation of colonial society into the "civilized" and the "indigenous" endowed the whole colonial system with consistency by means of the reduction of the natives to the category of natural objects.

If the savage represents the ultimate locus of inferiority, nature is the ultimate locus of exteriority (Santos, 1999). But since what is exterior does

not belong and what does not belong is not recognized as equal, the locus of exteriority is a locus of inferiority as well. The civilizing violence enacted upon the "savages" via the destruction of native knowledges and the imprinting of "true," civilized knowledge is performed, in the case of nature, through its transformation into an unconditionally available natural resource. In both cases, though, knowledge strategies are basically strategies of power and domination. In the case of the construction of "nature," knowledge and power went hand in hand; this is not to say that knowledge was produced in advance as an instrument to justify the subordination of nature to society, but that the latter is an effect of the joining of power and knowledge. The savage and nature are, in fact, the two sides of the same purpose: to domesticate "savage nature," turning it into a natural resource. This unique will to domestication makes the distinction between natural and human resources as ambiguous and fragile in the sixteenth century as it is today.

To be persuasive and effective, this account of the discovery of nature cannot question the nature of the discovery. Over time, what cannot be questioned ceases to be a question. Nature, turned into a resource, has no logic but that of being exploited to its exhaustion. Once nature is separated from human beings and from society, there is no way of conceiving of how they feed back into each other. This concealment prevents the formulation of balances and of limits, and that is why ecology can assert itself only through ecological crises.[24]

This construction of nature as external to society and as a resource—something alien to the peoples the Europeans came in contact with—was one of the core foundations of the capitalistic civilizational model. It followed the requirements of the constitution of the new world economic system based on the intensive exploitation of resources. The deterministic script resting upon the divisions of nature and society, of subject and object, and the central role of mathematical language turned nature into an interlocutor as unintelligible and alien as the "savages" dwelling in the territories occupied and conquered by Westerners: nature could not be understood; it could only be explained, and explaining it was the mission of modern science; it was there to be used, exploited and appropriated (Santos, 1999).

The building of colonial empires implied the export to the colonies of the ways of living of the so-called "civilized," a process that persists today, disguised as aid to the poor and underdeveloped (Diawara, 2000; Meneses, 2003; Pithouse, 2003). Colonialism, devised as an epistemic concept during imperial times, is still a synonym of the impoverishment of "local" knowledges in so far as it promotes the ghettoization of those knowledges and the

obliteration of other forms of knowing, that is, of producing and passing on experiences. The latter came to be confined to the condition of artifacts to be displayed in museums, as examples of an earlier, obscure, so-called "traditional" knowledge (Nygren, 1999; Lander, 2000). As a consequence, the plural landscape of knowledges existing in the world was rapidly overshadowed by the rise of modern science—a means of adjudicating supremacy and unicity.

In Africa and Asia, as had happened earlier in Latin America, the emergence of nationalist movements in the twentieth century would revive the debates over science and its function, the politics of knowledge, and the entitlement to existence of other forms of knowledge (Mondlane, 1969; Cabral, 1979; Apffel-Marglin and Marglin, 1990; Alvares, 1992; Diouf, 1993; Dussel, 1995; Visvanathan, 1998; Prakash, 1999; Mora-Osejo and Fals Borda, 2003; Meneses, 2003).But these debates would soon wither away with the independence of colonial territories. "Defeating underdevelopment" became the new rallying call.[25] The application of scientific results regarded as relevant and already achieved by other countries became a central aim. Efforts were thus directed towards the application and diffusion of scientific results and resources transferred from the North, both in the main front of the "battle for production" and in the training of qualified experts and technicians. Science was restored to its place of domination, this time as part of state-centered and deterministic schemes, stuffed with a rootless positivism that dismissed doubt, as was the case with the decision to build the big dams in India (Alvares, 1992). The buzzword was technological transfer and the associated concepts of invention, innovation, and diffusion. Invention was the experimental field of the expert, the scientist. Innovation was the world of technique, subject to local applications; and diffusion appeared as the very embodiment of democracy: the knowledges that had been at the root of the progress and prosperity of others were now made available for the common good (Visvanathan, 2003). During this period, science moved from a recurrent reflection on its social role to science as an object of popularization, of consumption: science as a marketable good.

By the time feminist criticism, science studies, and post-colonial studies relaunched debates over the legitimacy of different knowledges and their intercultural comparison, the influence of Western notions of rationality and scientificity had already transformed modern science into a central reference for assessing "other" local cultures and knowledge systems (Hountondji, 1994; Wiredu, 1996). This capacity to reproduce the Other *ad aeternum* through the epistemic and cultural dichotomy opposing scientific knowledge and alternative, rival knowledges has guaranteed the self-renewal, to the present, of the notion of underdevelopment. Having been stripped of experience, the South can regain it only through the accumulated experi-

ences of the North, exported under the form of "the transfer of scientific knowledge and technology." International agencies still operate on the premise that the South has problems and the North has the solutions to them. The global South, underdeveloped, illiterate, sick, becomes an object of intervention, and normalizes the right of the North to intervene and control, adapt, and reshape structures, practices, and ways of life. The argument of "development" thus helps legitimize interventions in the South, in order to accommodate it to Western norms of progress, governance, and efficiency. The idea of development encapsulates the notion that it is the North that possesses "good" knowledge and ensures that science will overcome superstition and ignorance and benefit the needy, namely those who lack any suitable environmental ethics and long-term sustainable planning, are unable to carry out experiments, etc. (Crewe and Harrison, 2002).

In most countries of the South, the political changes of the 1980s and 1990s took shape in the application of neoliberal reforms, many of them imposed by international agencies such as the World Bank and the International Monetary Fund, for whom technical support and the imposition of scientific knowledge produced in the North are key areas of intervention (Stiglitz, 1999; Mehta, 2001; Santos, 2006b). As Cox and Schechter argue (2002: 76), "*globalisation is a struggle over knowledge of world affairs,*" reminding us that science-as-commodity remains the central vector of subordination of South to North. Asymmetries between North and South are expressed in a broad range of dichotomies: donor/recipient; developed/underdeveloped; knowledge/ignorance; teaching/learning; thinking/acting; recommending/following; designing/implementing. The reconceptualization of power is useful here not only to broaden our understanding of colonial relations, but also for generating a powerful criticism of current political structures, institutions and practices of power.

A common element in different development discourses is the emphasis on the difference between specialist knowledge and local forms of knowledge and the deepening of oppositions such as rational/magical (religious), universal/particular, theoretical/practical, and modern/traditional. These powerful dichotomies influence the way in which arguments are constructed and favor one form of knowledge at the expense of another (or others). If scientific, modern knowledge is portrayed as holding a dynamic, neutral, and objective authority, this image contrasts with a static and particularistic vision of other systems of knowledge found in the world (Masolo, 2003; Meneses, 2003).

Within the context of contemporary interactions between modern science and other "local" knowledges, the latter are regarded as valid only when they

serve the projects of capitalist modernity; such is currently the case with traditional medical and agricultural knowledge, as discussed in the chapters by Laymert Garcia dos Santos, Flórez Alonso, Shiva, Meneses, Xaba, and Egziabher.

However, if the expressions "local knowledge," "indigenous knowledge," "traditional knowledge," or even "ethnoscience" have become part of academic discourse throughout the last two decades, their use in the North and the South is associated with distinct meanings. Until recently, social scientists did not recognize local forms of knowledge as being central to the process of development (Agrawal, 1995; Warren *et al.*, 1995; Battiste and Youngblood, 2000), nor were forms of so-called "lay" knowledge or experience regarded, in the North, as relevant sources and resources for the construction of epistemically and socially "robust" configurations of scientific knowledge (Irwin and Michael, 2003; Callon, Lascoumes, and Barthe, 2001).

It is increasingly acknowledged that current scientific knowledge imposes as the only true or adequate interpretation of reality a worldview conceived as a global explanation of the world, thereby eliminating the possibility of a complementarity or articulation of knowledges (Santos, 1995: 25 ff; 2004b). But if we take scientific knowledge as a form of globalized localism,[26] we may recognize that one of the aspects of the crisis of modern knowledge rests upon the fact that it perpetuates the relations of colonial inequality, giving shape to a monoculture of knowledge.[27]

Over the last two decades, the struggle of "alternative" knowledges has vigorously challenged this conception of other knowledges as "merely" local or indigenous by demonstrating that knowledges are hybrid and situated constructions (Nygren, 1999; Masolo, 2003; Derman, 2003). They are the outcomes of socially organized practices involving the mobilization of different types of material and intellectual resources, bound to specific situations and contexts. The call for the democratization of knowledges is equated with the multifarious capacity of science for interaction with other knowledges and practices, contesting the ideals of the "unity of science" (Dupré, 1993; Galison and Stump, 1996; Nader, 1996).

Towards new configurations of knowledges

A critical front that resonates strongly with the multiculturalism debates and pursues themes that are common to post-colonial, feminist, and science studies has allowed the recognition of plural systems of knowledges, alternative to modern science or entering into articulations with the latter and creating new configurations of knowledges. This process has been achieved,

with productive results, especially in the more peripheral areas of the modern world system, where the meeting of hegemonic and non-hegemonic knowledges is more unequal and violent. It is precisely in these areas that non-hegemonic knowledges and their carriers are more in need of founding their resistance in processes of self-knowledge that mobilize the broader social, cultural, and historical context that breeds and sustains inequality, while generating energies that resist it (see Meneses, Xaba, Escobar and Pardo, in this volume).[28]

These "local" resistances open up a window towards a broader critical evaluation of knowledge as situated and socially constructed, a perspective that allows for a more comprehensive "translation" and comparison among all knowledges (including scientific knowledge) on the basis of their capacities for the fulfillment of certain tasks in social contexts drawn by particular processes (including those that are associated with scientific knowledge). The work of translation, as we conceive of it, seeks to turn incommensurability into difference, a difference enabling mutual intelligibility among the different projects of social emancipation. The goal is to construct an ethical and political position without grounding it on any absolute principle, be it human nature or progress, since, historically, it was in their names that many emancipatory aspirations turned into forms of violence and atrocity, especially in the South. This stance is anti-relativistic. From the point of view of the pragmatics of social emancipation, relativism, as an absence of criteria for hierarchies of validity among different forms of knowledge, is an untenable position. If anything is equally valid as knowledge, all projects of social emancipation are equally valid or, which amounts to the same, equally invalid (Santos, 2004b). Dialogues between knowledges may lead to regional or sectoral universalisms constructed from below, that is, to counter-hegemonic global public spheres—what we refer to in this introduction as "subaltern cosmopolitism." Cosmopolitan approaches start from the recognition of the presence of a plurality of knowledges and of distinctive conceptions of human dignity and of the world. The merit or the validity of the different knowledges and conceptions must obviously be assessed, but not on the basis of the mere disqualification of some. The future is not in going back to old traditions, since no technology is neutral: each technology carries with it the weight of its mode of seeing and being in nature and with other human beings. The future can thus be found at the crossroads of knowledges and technologies.

The epistemic diversity of the world is open, since all knowledges are situated. There are neither pure nor complete knowledges; there are constellations of knowledges. The claim of the universal character of modern science is increasingly displayed as just one form of particularism, whose specificity consists of having the power to define all the knowledges that are

its rivals as particularistic, local, contextual, and situational. The recognition of epistemological diversity is a highly contested terrain because in it converge not only contradictory epistemological and cultural conceptions but also contradictory political and economic interests. A domain in which this has become most evident in recent times is biodiversity, which appears as an exemplary instance of the issues dealt with in this introduction.

CONTENTIOUS AREAS: THE CASE OF BIODIVERSITY

There is enough evidence today of how capitalism has appropriated the human body, turning cells into microfactories, revolutionizing the concept of social work, and eroding even more the thin line that separates the reproduction of life from the production of life, as is shown, in this volume, by Laymert Garcia dos Santos. When human nature is conceived as a potential or actual commodity and is used as technology—specifically in the case of reproduction and genetic research—the belief in scientific progress is inscribed in the human body itself. Biological and human integrity thus become vulnerable to the demands of the market. Studies of biodiversity and the projects related to the human genome have shown that the emerging markets for genetic information are new areas for both the accumulation of capital and the construction of new meanings and contexts for nature, both human and non-human (Wilkie, 1996; Haraway, 1997; Flinter, 1998; Hayden, 1998; Reardon, 2005).[29]

These issues have fostered a proliferation of controversial themes at the intersection of the internal debates within scientific knowledge, of the tensions and confrontations between rival forms of knowledge, and of the contradictions and conflicts that weave together the scientific-technical, the political, the cultural, and the economic that the critics of colonialism and of coloniality have brought to the fore. The controversies over biodiversity condense in an exemplary way these different dimensions of contention.

The concept of biodiversity emerged in the late 1980s and early 1990s (Takacs, 1996), and was rapidly integrated into the discourse on the environmental situation of the world, namely in international fora such as the 1992 Rio Summit. It has tight connections to the conception of the South as the world reservoir of biological diversity (Shiva, 1993; and in this volume). Biodiversity or biological diversity is understood, according to the United Nations Convention on Biological Diversity (CBD), in its article 2, as the "*variability among living organisms of all origins, including, inter alia, the terrestrial, marine and other aquatic ecosystems and the ecological complexes they are part of. It includes the internal diversity of species, between species and of ecosystems.*"[30] The World Resources Institute proposed a broadening of this

definition, including genetic diversity, the variations among individuals and populations within the same species, and the diversity of species and ecosystems (WRI, 1994: 147). The term "biodiversity" in fact refers to the diversity of organisms, genotypes, species, and ecosystems, but also to the knowledges about that diversity.

The actually existing knowledge of ecosystems and of living species and organisms is a lot broader than that "officially" registered in databases constructed by scientific institutions.[31] Not surprisingly, as Laymert Garcia dos Santos analyzes in his contribution, the construction of what is currently a network—or, more precisely, a set of networks—of knowledges on biodiversity has not been the outcome of a hegemonic conception and of the "stabilization" of that concept, as happened in other instances of technoscience when it met other knowledges. The alternative discourses produced by subaltern actors are themselves part of that network, and they circulate within it with great visibility and impact. The discourse on biodiversity is, in fact, a set of discourses where different knowledges, cultures, and political strategies intersect. In spite of being dominated by institutions from the North (NGOs, botanical gardens, universities and research institutions, pharmaceutical multinational corporations, etc.), the knowledges produced by these networks have been used as well in "subversive" ways, through their appropriation by social movements of the South and their allies and through their reinscription in other constellations of power–knowledge. Escobar (1999) thus identifies four main positions within the biodiversity network:

1. A "globalocentric" view, focused on the management of the resources of biodiversity, sustained mainly by global institutions, including the World Bank, G8 and several NGOs based in the North, such as the World Conservation Union, the World Resources Institute or the World Wildlife Fund. The focus of this view is the response to what it defines as the threats to biodiversity, including the loss of habitats, the introduction of species in foreign environments, the fragmentation of habitats following their reduction, etc. Responses consist of a set of measures articulated at different levels (local, regional, global), including scientific research, inventories, *in situ* conservation, national planning of the management of biodiversity and the creation of economic mechanisms to promote the conservation of resources, such as intellectual property rights and others. The CBD itself draws on dominant views of science, capital, and management practices, and is at the origin of the current dominant discourse on biodiversity. A role is acknowledged, under this perspective, for knowledges alternative to the dominant ones, usually described as "traditional," but the position that governs is that which endows science with a central role in designing strategies of conservation, insertion in programs for sustainable development,

or the creation of a variety of schemes for sharing benefits between national governments, corporations, research institutions, and communities. It is mostly in relation to so-called bioprospecting that these schemes have been proposed over the last two decades.[32]

2. A national perspective, in countries of the South, that, without putting into question the main features of the previous position and the "globalocentric" discourse, seeks to negotiate the terms of treaties and strategies for biodiversity following what they define as the national interest. According to Escobar (1999: 59), the topic of genetic resources has given a renewed vigor to the interest of governments in these negotiations. Included among the most lively discussed themes of these negotiations are conservation *in situ* and access to collections *ex situ*, sovereignty over genetic resources, ecological debt, and technology transfers. Some of the studies included in this volume, such as those by Escobar and Pardo and Borges Coelho, provide a record and analysis of these negotiations.

3. A conception sustained by the progressive NGOs of the South that may be described as biodemocracy: through a reinterpretation of "threats to biodiversity"—emphasizing the destruction of habitats through megaprojects of development, the monocultures of the mind, agriculture promoted by capital and the reductionist science and habits of consumption of the North promoted by narrowly conceived economic models—biodemocracy advocates the displacement of attention from South to North as the origin of the biodiversity crisis. At the same time, it suggests a radical redefinition of production and productivity, moving away from a logic of uniformity towards a logic of diversity. The latter assumes the local control of natural resources, the suspension of developmental megaprojects, support for projects promoting the logic of diversity, and the recognition of a cultural basis associated with biological diversity.[33] Those who advocate this approach oppose the use of biotechnology as a means for maintaining diversity[34] and of intellectual property rights (IPR) as a tool for the protection of local knowledges and resources, proposing as an alternative the defense of collective rights. The articulation of forms of local activism connected through networks at the transnational and global scales appears here as an effective means of defending local knowledges.

4. Finally, the perspective of cultural autonomy starts form a critique of the concept of "biodiversity" as a hegemonic construction to search for the opening up of spaces within the biodiversity network. This enables the construction of forms of development based on culture and on livelihood projects associated with places, in order to counter ethnocentric or, as

Escobar describes them, "extractivist" orientations towards biological diversity. This position is upheld by the movements of the Pacific coast of Colombia studied by Escobar and Pardo, in this volume.[35]

The controversies and conflicts over biodiversity raise new questions concerning the foundational overlap of the discovery of the savage and the discovery of nature. It is hardly by chance that a good deal of the biodiversity of the planet is present in territories inhabited by indigenous peoples, for whom nature never was a natural resource, as the West understands this notion. For these peoples, nature cannot be dissociated from society, within the frame of cosmologies that divide and classify the world in ways that are different from the one enshrined by modern, Western cosmology. Colonialism and, at a later stage, the forms of subalternization that are characteristic of post-colonialism are associated with attempts to destroy these cosmologies and their worlds. Nowadays, as happened in the dawn of the world capitalist system, the multinational corporations of the pharmaceutical industry and of biotechnology seek to turn the indigenous peoples themselves into resources, no longer labor resources, but genetic resources and tools for accessing, through traditional knowledges, plants and other living beings, including human biology itself, in the form of biodiversity.[36] The IPRs that allow and legitimate these forms of appropriation of indigenous and local knowledge and the private appropriation of goods that are vital, for instance, for the safeguard and promotion of public health rest upon conceptions of private property rooted in the legal order of capitalism.[37] This is a central concern associated with the application of TRIPS.[38] Its article 27.3b requires from member countries of the World Trade Organization that they award patents over living matter, with the exception of plants and animals, although the obligation is still pending on offering an effective *sui generis* protection of the varieties of plants (Flórez and Rojas, 2001). If for some this offer appears as a solution to strengthen the collective rights of indigenous peoples and farming communities within the narrow space for maneuver allowed by this legal Western codification,[39] there are many who oppose any form of legal compromise on protection. For them, any global legal imposition is seen as a threat to the survival of communities, as an attack on their cultures and on their rights. Ultimately, what is at stake is the sovereignty of each culture, of each community, since the imposition of TRIPS—and consequently the rise of monopolies over seed banks, for instance—threatens the possibility of protecting the world's genetic diversity (Cullet, 2001), enforcing a regime of monocultures of knowledge and increasing the risk of contamination with genetically modified plants of the places where greatest biological diversity is found (Simpson, 1997).

The process—typical of dominant approaches in the fields of technoscientific knowledge involved in the prospection of biodiversity, of decomposing and reducing the phenomena of life and of the diversity of the living, and appropriating them as knowledge and as commodities—has been denounced as biopiracy (Shiva, 1997; Mooney, 2000; Laymert Garcia dos Santos, in this volume). There have been, however, attempts at defining alternative frameworks for legislation and the regulation of the appropriation of local and community knowledges, and in particular of knowledges of biodiversity. The Model Proposal of Law of the Organization for African Unity, proposed by the government of Ethiopia in 1998, seeks to promote legislative initiatives based on the cooperation of African states with a view to the protection of the resources of biodiversity and local forms of social organization and to ensure food sovereignty, through the defense and active mobilization of what we describe as rival knowledges.[40]

The wide circulation, reinterpretation and redefinition of the concept of biodiversity, despite all its problems and limitations, has thus given rise to new possibilities of articulating different cosmologies and languages from a variety of critical perspectives that seek to redefine the articulations between—or the mutual constitution or co-production of—objects, beings, and the qualities that used to be attributed either to nature or to culture (Descola and Palsson, 1996; Haraway, 1997).

CONCLUSION: TOWARDS AN EMANCIPATORY, NON-RELATIVISTIC, COSMOPOLITAN ECOLOGY OF KNOWLEDGES

The case studies included in this volume articulate the different themes dealt with in the previous sections, and go one step further by exemplifying the promises, possibilities, and difficulties of bringing together and staging dialogues and alliances between diverse forms of knowledge, cultures, and cosmologies in response to different forms of oppression that enact the coloniality of knowledge and power. Boaventura de Sousa Santos's appeal for "learning from the South" (1995: 508) indicates precisely that the aim to reinvent social emancipation goes beyond the critical theory produced in the North and the social and political praxis to which it has subscribed. As a contribution to the "opening" of the canon of knowledge, we have formulated a set of theses on the ongoing debates and initiatives on diversity and recognition.

1) *Different human communities produce diverse forms of viewing and dividing up the world, which do not necessarily conform to Eurocentric distinctions. The latter include, for example, those that divide up social practice between the economy, society, the state, and culture, or that drastically separate nature from society. A re-evaluation of the relationship between these different conceptions of the world and their repercussions on law and justice is currently in progress.*

Differences between worldviews become explicit and turn into sites of struggle when the integrity of the communities is threatened by alternative notions of relationships to territory—such as those that are based on the individual right to property—or when the distinction between respect for culture and the imperative of development is drawn upon to justify the exploitation of "natural resources" by external forces (be they national or multinational institutions).

The adoption of Eurocentric legal and political models, and claims of their allegedly universal validity, such as the neoliberal economic order, representative liberal democracy, or the supremacy of liberal law, often rest upon forms of domination based on class, ethnic, territorial, racial, or sexual difference and on the denial of collective identities and rights deemed incompatible with Eurocentric definitions of the modern social order. Yet, there is scope for the right to difference to be affirmed, as several examples discussed here demonstrate, by creating conceptions of normality, law, nature, and morality alternative to dominant conceptions.

2) *Different forms of oppression or domination generate equally distinct forms of collective resistance, mobilization, subjectivity, and identity, which invoke differentiated notions of justice and dignity. In these types of resistance and their local/global articulation through procedures of intercultural translation resides the impulse towards counter-hegemonic globalization.*

It is by resisting assimilation that indigenous populations have come to impose on the Latin American states recognition of their identity as a people and of their collective rights. The rural populations in various regions of India are struggling against the multinationals, international organizations, and the state itself for the right to their own environment, way of life, and natural resources. Human rights activists are fighting for human dignity and against suffering in different parts of the world.

The collective identities associated with these different forms of struggle are the emerging result of the struggles themselves, even when based on preexisting conditions or collectives. The ability to widen, sustain, and win the struggles depends on the transition of these communities from local to imagined and invented communities, created through a "voracity of scales" that enlarges the struggles from the local to the national and transnational. The successes of the indigenous movements in Brazil and in Colombia in mobilizing translocal and transnational solidarity provide exemplary illustrations of the importance of broad circles of reciprocity. The language of culture and multiculturalism is mobilized, in these situations, as a fundamental strategic resource and as a means of making claims for difference that are mutually intelligible and shared.

3) *Emancipatory politics and the invention of new citizenships are played out within the tensions between equality and difference, that is, between the need for redistribution and the demand for recognition.*

Equality and difference are not, in themselves, sufficient conditions for a politics of emancipation. The debate on human rights and their reinvention as multicultural rights, as well as the struggles of indigenous peoples show that the affirmation of equality based on universalistic presuppositions, such as those that prevail in Western individualistic conceptions of human rights, lead to the decharacterization and denial of differentiated identities, cultures, and historical experiences, particularly through the refusal to recognize collective rights. Yet the affirmation of difference, in itself, can serve to justify discrimination, exclusion, or subordination in the name of collective rights and cultural specificity. The collective rights of the indigenous populations of Brazil and Colombia have come to be recognized and affirmed through their struggles in the 1988 and 1991 Constitutions, respectively, thus giving rise to a multicultural constitutional order. As the case of India suggests, the legal pluralism that results from the intersecting dynamics of the global, the national, and the local can create spaces for the recognition of alternative forms of normativity, but these can only effectively result in emancipatory dynamics in articulation with alternative conceptions of justice and redistribution policies directed towards the most vulnerable and subaltern groups in the population. In the case of the U'wa or the Afro-Colombians of the Pacific coast, the affirmation of identity is a resource for demanding recognition of their collective rights, associated with an effective guarantee of control over a territory and its resources. In other cases, as with natural disasters in Mozambique, identity enacted on the basis of local knowledges can also be used to contrast external, national solutions. In order to address these tensions and dilemmas Boaventura de Sousa Santos (this volume) proposes the following meta-right: we have the right to be equal when difference breeds inferiority and the right to be different when claims of equality threaten our right to identity based on shared experiences and histories.

4) *The epistemic diversity of the world is potentially infinite. There is no ignorance or knowledge in general. All ignorance is ignorant of a certain knowledge, and all knowledge is the overcoming of a particular ignorance. There are no complete knowledges.*

As the concrete experiences discussed here show, the epistemological diversity of the world is immense. The production of knowledge is, in itself, a social practice and what distinguishes it from other social practices is the thinking or reflecting on actors, actions and their consequences in the contexts where they take place. Every form of knowledge thus involves

self-reflexivity, which productively reshapes the context of practices into the motive and engine of actions that do not simply repeat their contexts. This self-reflexivity is the same as the discovery of hetero-referentiality. It is the first step towards the recognition of the epistemological diversity of the world. The latter, in turn, is inseparable from the diversity of cosmologies that divide and organize the world in ways that are different from that of Western cosmology and modern science. A cosmopolitan epistemology must start from the recognition of the presence of a plurality of knowledges and of different conceptions of human dignity, nature, and the world itself, as the cases from South Africa, Mozambique, Brazil, India, and Colombia suggest. The principle of incompleteness of knowledges is a basic condition for the possibility of epistemological dialogue and debate among knowledges.

5) *In practice, knowledges operate as constellations of knowledges. The relativity of knowledges is not synonymous with relativism.*

Constellations of knowledges always involve hierarchies among the forms of knowledge that constitute them. The practical knowledge and good sense of the scientist in the laboratory are very important, but, of course, scientists are at the service of the scientific knowledge he or she starts from and seeks to advance. In other words, from a pragmatist point of view, relativism is a non-issue. No human practice could be carried out in a consistent way if all the different types of knowledge that intervene in it had the same weight. As an epistemological problem, relativism is less about criteria of validation than about the criteria for establishing hierarchies of validation or their absence. From the point of view of the pragmatics of social emancipation that is at the center of the research project out of which came the studies in this volume, relativism, as long as it is regarded as an absence of criteria for the hierarchies of validation, is an untenable position, since it makes impossible the very conception of a meaningful relation between knowledge and social change. If everything is equally valid, and equally valid as knowledge, all projects of social change are equally valid or (which is the same) equally lacking in validity.

6) *The epistemological privilege of modern science is a complex phenomenon that cannot be explained in exclusively epistemological terms. The claim of the universal character of modern science is just one form of particularism, whose specificity is the power to define all the knowledges that are its rivals as particularistic, local, contextual, and situational. Global cognitive justice will be possible by substituting a monoculture of scientific knowledge by an ecology of knowledges.*

The differences among knowledges imposed by modern science are the result of what counts as relevant knowledge, differences in identifying, validating, or hierarchizing the relations between Western-based scientific

knowledge and other knowledges derived from other practices, rationalities, or cultural universes.

After centuries of mutual implication between epistemological models and models for social change, it is not possible to think and even less enact alternatives for emancipatory social change without epistemological changes. The challenge of an ecology of knowledges (Santos, 2004a: 168–171) is the epistemological stance from which it is possible to start thinking about the decolonization of science and, thus, the creation of a new type of relationship between scientific knowledge and other knowledges. The ecology of knowledges represents the possibility of opening up the dominant canon of knowledge and recognition, by bringing into the picture other, alternative, non-scientific knowledges. This new relationship lies in granting an "equality of opportunities" to the different kinds of knowledge engaged in ever broader epistemological disputes aimed at maximizing their respective contributions to build a more democratic and just society, and the decolonization of knowledge and power. The point is not to ascribe equal validity to all kinds of knowledge but rather to allow for a pragmatic discussion of alternative criteria of validity, which does not straightforwardly disqualify whatever does not fit the epistemological canon of modern science.

It is not so much a matter of opposing modern science to other knowledges as of creating dialogues, both within science and between different conceptions and practices of knowledge that the ruling epistemology is unable to identify. What is at stake in the epistemological change we propose is not the validity of science, but its exclusive validity. The proposed pluralism of knowledges will facilitate radical democratization and the decolonization of knowledge and power.

7) *The decolonization of science is based on the idea that there is no global social justice without global cognitive justice. The logic of the monoculture of scientific knowledge and rigor must be confronted with the identification of other knowledges and criteria of rigor that operate credibly in other social practices regarded as subaltern.*

The coloniality of power and knowledge plays a central role in providing the conditions and resources for multiple forms of domination and discrimination. Colonialism has come to an end as a political relationship, but not as a social relationship, persisting in the shape of the coloniality of power. In dealing with the relations between North and South, between core and periphery of the world-system, the coloniality of power is, nowadays more than ever, inextricable from the coloniality of knowledge. Neoliberal globalization and the strict recipes of economic science and the type of technological development they promote have brought to a peak the destruction of other knowledges and practices, worldviews, symbolic worlds, and the modes of living they legitimate and make credible. This massive

attack on the diversity of knowledges in the world promotes an unprecedented impoverishment of social and cultural experience.

8) *The recognition of the diversity and plurality of knowledges requires the internal democratization of science itself.*

There are two sides to this. The first concerns the recognition of the internal plurality of science, not only the plurality that follows from disciplinary divisions but also that emerging from the different theoretical, analytical, and conceptual traditions and of their modes and processes of constructing knowledge, and the ways in which controversy and methodological transgression are dealt with. The process of paradigm construction is neither linear nor irreversible and even after its consolidation rival paradigms persist with more or less visibility. The persistent signs of the existence of the latter, even if repressed by the mechanisms Kuhn identified, are not just residues of the past; they may well be the embryos of new paradigms. Their insertion in the process of making science is related to their multi-situatedness. In other words, science is produced in different social contexts and these are not external to science; rather, science and context interpenetrate to co-produce practices and styles of scientific activity. This does not make scientific knowledge less valid in general. But it is upon these features that the always provisional and relative validity of scientific statements, their recurrently contestable "warranted assertibility," as John Dewey put it, rest. The recognition of this internal plurality expands the scope of theoretical, analytical, and epistemological debates and makes science more pliable and open to the epistemological diversity of the world. In other words, recognition of internal plurality is a condition for the recognition of external plurality.

The other side of the democratization of science concerns the relationships and mutual engagements of scientific communities and citizens, of scientific knowledge and the cognitive skills required for active citizenship, both individual and collective, in societies that conceive of their welfare as increasingly inseparable from their multicultural character and as dependent on the quantity and quality of the knowledges circulating within them. From laboratory practices to ritual practices, every human activity with a minimal degree of complexity mobilizes a plurality of types of knowledge, even if one of these comes to be dominant in configuring the practice in question and the way in which it relates to the context it operates in and transforms. In pragmatist terms, there are only constellations of knowledges and the most decisive epistemological question is that which asks for the hierarchies of the different types of knowledge within these constellations, for the reasons for those hierarchies, for their effectiveness, and for their consequences.

9) *The transition from a monoculture of scientific knowledge to an ecology of knowledges will make possible the replacement of knowledge-as-regulation with knowledge-as-emancipation.*

The ecology of knowledges is the principle of consistency underlying constellations of knowledges. The transition from the monoculture of scientific knowledge to the ecology of knowledges will be difficult since its success is concurrent with that of other transitions pointing towards post-capitalist horizons of radical democracy and the decolonization of power and knowledge. One way of describing this process is as the replacement of knowledge-as-regulation by knowledge-as-emancipation. Knowledge-as-regulation knows through a trajectory that goes from ignorance, regarded as disorder, to knowledge, described as order, while knowledge-as-emancipation knows through a trajectory that leads from ignorance, conceived of as colonialism, to knowledge conceived of as solidarity (Santos, 1995: 25–27; 2002). The possibility of modern science contributing to the construction of knowledge-emancipation was historically frustrated by the self-assigned epistemological exclusiveness of modern science, a process "required," historically, by the increasing connections of science to the objectives of social change associated with capitalism and colonialism. The recovery of the emancipatory potential of science is possible through the democratization and decolonization of science. But this requires that science cease to be a metonymy of knowledge and become one of its constituents, an important one for sure, within the constellations of knowledges aiming at social emancipation.

BIBLIOGRAPHY

Abrahamsen, R. (2003), "African Studies and the Postcolonial Challenge," *African Affairs*, 102, 189–202.

Afzal-Khan, F.; Sheshadri-Crooks, K. (2000), *The Pre-occupation of Postcolonial Studies*. Durham, NC: Duke University Press.

Agrawal, A. (1995), "Dismantling the Divide between Indigenous and Scientific Knowledge," *Development and Change*, 26(3), 413–439.

Ahmad, A. (1992), *In Theory: Classes, Nations, and Literatures*. London: Verso.

Alvares, C. (1992), *Science, Development and Violence: The Revolt against Modernity*. Delhi: Oxford University Press.

Anderson, B. (1983), *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London: Verso.

Apffel-Marglin, F.; Marglin, S. A. (eds.) (1990), *Dominating Knowledge: development, culture and resistance*. Oxford: Clarendon Press.

Asad, T. (1991), "Afterword: From the History of Colonial Anthropology to the Anthropology of Western Hegemony," *in* G. Stocking (ed.), *Colonial Situations: Essays on the Contextualization of Ethnographic Knowledge*. Madison: University of Wisconsin Press.

Balick, M.; Elisabetsky, E.; Laird, S. (eds.) (1996), *Medicinal Resources of the Tropical Forests*. New York: Columbia University Press.
Battiste, M.; Youngblood Henderson, J. (2000), *Protecting Indigenous Knowledge and Heritage*. Saskatoon: Purich Publishing Ltd.
Bebbington, A. (1993), "Modernization from Below: an Alternative Indigenous Development?," *Economic Geography*, 69(3), 274–292.
Bennett, D. (1998), *Multicultural States: Rethinking Difference and Identity*. London: Routledge.
Bhabha, H. K. (1994), *The Location of Culture*. London: Routledge.
Bharucha, R. (2000), *The Politics of Cultural Practice: Thinking Through Theatre in an Age of Globalisation*. London: The Athlone Press.
Cabral, A. (1979), *Unity and Struggle: Speeches and Writings of Amilcar Cabral*. New York: Monthly Review Press.
Callon, M.; Lascoumes, P.; Barthe, Y. (2001), *Agir dans un Monde Incertain: Essai sur la Démocratie Technique*. Paris: Éditions du Seuil.
Caporale, L. H. (1996), "The Merck/INBio Agreement: A Pharmaceutical Company Perspective,", *in* M. J. Balick, E. Elisabetsky and S. Laird (eds.), *Medicinal Resources of the Tropical Forest*. New York: Columbia University Press, 137–141.
Césaire, A. (2000), *Discourse on Colonialism*. New York: New York University Press
Chabal, P. (ed.) (2002), *A History of Postcolonial Lusophone Africa*. Bloomington: Indiana University Press.
Chakrabarty, D. (2000). *Provincializing Europe*. Princeton, NJ: Princeton University Press.
Clifford, J. (1997), *Routes: Travel and Translation in the late twentieth century*. Cambridge, MA: Harvard University Press.
Cox, R.; Schechter, M. (2002). *The Political Economy of a Plural World: Critical Reflections on Power, Morals and Civilization*. London: Routledge.
Creager, A. N. H.; Lunbeck, E.; Schiebinger, L. (eds.) (2001), *Feminism in Twentieth-Century Science, Technology, and Medicine*. Chicago: University of Chicago Press.
Crewe, E.; Harrison, E. (2002). *Whose Development? An Ethnography of Aid*. London: Zed Books.
Cullet, P. (2001), "Plant Variety Protection in Africa: Towards Compliance with TRIPs Agreement," *Biopolicy International*, 23.
Dean, B.; Levi, J. M. (eds.) (2003). *At the Risk of Being Heard: Identity, Indigenous Rights, and Postcolonial States*. Ann Arbor: University of Michigan Press.
Derman, W. (2003), "Cultures of Development and Indigenous Knowledge: the Erosion of Traditional Boundaries," *Africa Today*, 50(2), 67–85.
Descola, P.; Palsson, G. (eds.) (1996), *Nature and Society: Anthropological Perspectives*. London: Routledge.
Diawara, M. (2000), "Globalization, Development Politics and Local Knowledge," *International Sociology*, 15(2), 361–371.
Diouf, M. (1993), "Les Intellectuels Africains face à l'Entreprise Démocratique," *Politique Africaine*, 51, 35–47.
Dirlik, A. (1994), "The Postcolonial Aura: Third World Criticism in the Age of Global Capitalism," *Critical Inquiry*, 20, 328–356.
Dupré, J. (1993), *The Disorder of Things: Metaphysical Foundations of the Disunity of Science*. Cambridge, MA: Harvard University Press.

Dupré, J. (2003), *Darwin's Legacy: What Evolution means Today*. Oxford: Oxford University Press.
Dussel, E. D. (1994), *1492: El Encubrimiento del Otro, hacia el Origen del "Mito de la Modernida."* La Paz: Plural Editores y Universidad Mayor de San Andrés.
Dussel, E. D. (1995), *The Invention of the Americas: Eclipse of "The Other" and the Myth of Modernity*. New York: Continuum.
Dussel, E. D. (2000), "Europa, Modernidad y Eurocentrismo," in E. Lander (ed.), *La colonialidad del Saber: Eurocentrismo y Ciencias Sociales—Perspectivas Latinoamericanas*. Buenos Aires: CLACSO, 41–53.
Egziabher, T. (1999), "The TRIPs Agreement of the WTO and the Convention on Biological Diversity: the Need for Coordinated Action by the South," *Third World Resurgence*, 106. Access in October 2001 at http://www.twnside.org.sg/.
Ekpere, J.A. (2000), *The OAU's Model Law—The Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources* (an explanatory booklet). Lagos: Organization of African Unity, Scientific, Technical and Research Commission.
Elà, J.-M. (1998), *Innovations Sociales et Renaissance de l'Afrique Noire: les Défis du "Monde d'en bas"*. Paris: L'Harmattan.
Escobar, A. (1995), *Encountering Development: the Making and Unmaking of the Third World*. Princeton, NJ: Princeton University Press.
Escobar, A. (1999), "After Nature: Steps to an Anti-essentialist Political Ecology," *Current Anthropology*, 40(1), 1–30.
Escobar, A. (2003), "Actores, Redes e Novos Produtores de Conhecimento: os Movimentos Sociais e a Transição Paradigmática nas Ciências," in B. S. Santos (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 605–630.
ETC Group (2002), "Conquering Nature! . . . and Sidestepping the Debate over Biotech and Biodiversity." *ETC News Release, April 4th 2002*. Acessed on April 2002, at http://www.rafi.org/documents/.
Eze, E. C. (ed.) (1997). *Postcolonial African Philosophy: a Critical Reader*. Oxford: Blackwell Publishers.
Fanon, F. (1963), *The Wretched of the Earth. Pref. by Jean-Paul Sartre*. New York: Grove Press.
Fausto-Sterling, A. (2000), *Sexing the Body: Gender Politics and the Construction of Sexuality*. New York: Basic Books.
Flinter, M. (1998), "Biodiversity: of Local Commons and Global Commodities," in M. Goldman (ed.), *Privatizing Nature: Political Struggles for the Global Commons*. New Brunswick, NJ: Rutgers University Press, 144–161.
Floréz, M.; Rojas, I. (2001), "Conflicto entre Comercio global y Biodiversidad," Fundación Gaia/*GRAIN*, 6.
Franklin, S. (1995), "Science as Culture, Cultures of Science," *Annual Review of Anthropology*, 24, 163–184.
Fujimura, J. H. (1997), *Crafting Science: a Sociohistory of the Quest for the Genetics of Cancer*. Cambridge, MA: Harvard University Press.
Galison, P. (1997), *Image and Logic: A Material Culture of Microphysics*. Chicago: University of Chicago Press.
Galison, P.; Stump, D.J. (eds.) (1996), *The Disunity of Science: Boundaries, Contexts, and Power*. Stanford, CA: Stanford University Press.

Gandhi, M. K. (2001). *The Selected Works of Mahatma Gandhi*. Vols. II, III. Ahmedabad, Navajivan Publishing House.

Gardey, D.; Löwy, I. (eds.) (2000), *L'Invention du Naturel. Les Sciences et la Fabrication du Féminin et du Masculin*. Paris: Éditions des Archives Contemporaines.

Gieryn, T. F. (1999), *Cultural Boundaries of Science: Credibility on the Line*. Chicago: University of Chicago Press.

Gould, S. J. (2002), *The Hedgehog, the Fox, and the Magister's Pox: Mending the Gap between Science and the Humanities*. New York: Three Rivers Press.

Guha, R.; Martínez-Allier, J. (1997), *Varieties of Environmentalism: Essays North and South*. London: Earthscan.

Gunew, S. (2004), *Haunted Nations: The Colonial Dimensions of Multiculturalisms*. London: Routledge.

Haraway, D. J. (1992), *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. London: Verso.

Haraway, D. J. (1997), *Modest_Witness@Second_Millenium. FemaleMan_ Meets_Oncomouse: Feminism and Technoscience*. New York: Routledge.

Harding, S. (1986), *The Science Question in Feminism*. Ithaca, NY: Cornell University Press.

Harding, S. (1998), *Is Science Multicultural? Postcolonialisms, Feminisms, and Epistemologies*. Bloomington: Indiana University Press.

Harding, S. (ed.) (2003), *The Feminist Standpoint Theory Reader: Intellectual and Political Controversies*. New York: Routledge.

Hayden, C. P. (1998), "A Biodiversity Sampler for the Millenium", in S. Franklin, H. Ragoné (eds.), *Reproducing Reproduction: Kinship, Power, and Technological Innovation*. Philadelphia: University of Pennsylvania Press, 173–206.

Hegel, G. W. F. (1970), *Vorlesungen über die Philosophie der Geschichte*. Moldenhauer, E.; Michel, K.M. (eds.), Frankfurt am Main, Suhrkamp.

Hobart, M. (1993), "Introduction: the Growth of Ignorance?", in M. Hobart (org.), *An Anthropological Critique of Development: The Growth of Ignorance*. London: Routledge, 1–30.

Hountondji, P. J. (ed.) (1994), *Les Savoirs Endogènes: Pistes pour une Recherche*. Dakar: CODESRIA.

Hountondji, P. J. (2002). *The Struggle for Meaning: Reflections on Philosophy, Culture, and Democracy in Africa*. Athens: Ohio University Center for International Studies.

Irwin, A.; Michael, M. (2003), *Science, Social Theory and Public Knowledge*. Maidenhead: Open University Press/McGraw-Hill Education.

Jasanoff, S.; Markley, G. E.; Peterson, J. C.; Pinch, T. (eds.) (1995), *Handbook of Science and Technology Studies*. Thousand Oaks, CA: Sage.

Jewitt, S. (2000), "Unequal Knowledges in Jharkhand, India: De-Romanticizing Women's Agroecological Expertise", *Development and Change*, 31(4), 961–985.

Keating, P.; Cambrosio, A. (2003), *Biomedical Platforms: Realigning the Normal and the Pathological in Late twentieth-century medicine*. Cambridge, MA: MIT Press.

Keller, E. F. (1985), *Reflections on Gender and Science*. New Haven, CT: Yale University Press.

Keller, E. F. (1995), *Refiguring Life: Metaphors of Twentieth-Century Biology*. New York: Columbia University Press.

Keller, E. F. (2002), *Making Sense of Life: explaining Biological Development with Models, Metaphors, and Machines*. Cambridge, MA: Harvard University Press.

King, S. R.; Carlson, T. J. S.; Moran, K. (1996), "Biological Diversity, Indigenous Knowledge, Drug Discovery, and Intellectual Property Rights," in S. King; D. Stabinsky (eds.), *Valuing Local Knowledge*. Washington: Island Press, 167–185.

Kleinman, D. L. (ed.) (2000), *Science, Technology and Democracy*. New York: State University of New York Press.

Kleinman, D. L.; Kloppenburg, J. (1991), "Aiming for Discursive High Ground: Monsanto and the Biotechnology Controversy," *Social Forum*, 6, 422–447.

Klug, H. (2005). "Campaigning for Life: building a New Transnational Solidarity in the face of HIV-AIDS and TRIPS," in B. S. Santos; C. Rodriguez Gavarito (eds.), *Law and Globalization from Below: Towards a Cosmopolitan Legality*. Cambridge, Cambridge University Press, 118–139.

Kohler, R. E. (2002), *Landscapes and Labscapes: Exploring the Lab-Field Border in Biology*. Chicago: University of Chicago Press.

Kymlicka, W. (1995), *Multicultural Citizenship*. Oxford: Oxford University Press.

Lacey, H. (2002), *Alternatives to Technoscience and the Values of Forum Social Mundial*. Paper delivered at the II World Social Forum (Workshop on technoscience, ecology and capitalism), Porto Alegre, January–February 2002.

Lander, E. (org.) (2000), *La colonialidad del saber: eurocentrismo y ciencias sociales—perspectivas latinoamericanas*. Buenos Aires: CLACSO.

Latour, B. (1987), *Science in Action*. Milton Keynes: Open University Press.

Latour, B. (1999a), *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.

Latour, B. (1999b), *Politiques de la Nature: Comment Faire entrer les Sciences en Démocratie*. Paris: La Découverte.

Leach, M. (1992), "Gender and the Environment: Traps and Opportunities," *Development in Practice*, 2(2), 12–22.

Leff, E. (2004), *Saber Ambiental: Sustentabilidad, Racionalidad, Complejidad, Poder*. México: Siglo VeintiUno Editores.

Loomba, A. (1998), *Colonialism/Postcolonialism: the new Critical Idiom*. London: Routledge.

Lowe, L.; Lloyd, D. (1997), "Introduction", *The Politics of Culture in the Shadow of Capital*. Durham, NC: Duke University Press, 1–32.

Lynch, M. (1993), *Scientific Practice and Ordinary Action: Ethnomethodology and Social Studies of Science*. Cambridge: Cambridge University Press.

Mama, A. (2001), "Challenging Subjects: Gender, Power and Identity in African Contexts," *South African Journal of Sociology*, 5(2), 63–73.

Masolo, D. A. (2003), "Philosophy and Indigenous Knowledge: an African perspective," *Africa Today*, 50(2), 21–38.

Mbembe, A. (2001), *On the Postcoloniality*. Berkeley: University of California Press.

McClintock, A. (1995), *Imperial Leather: race, gender and sexuality in the colonial conquest*. New York: Routledge.

Mehta, M. (1996), "Our Lives Are no Different from That of our Buffaloes," *in* D. Rocheleau, B. Thomas-Slayter and E. Wangari (orgs.), *Feminist Political Ecology, Global Issues and Local Experiences*. New York: Routledge, 180–210.

Memmi, A. (1965), *The Colonizer and the Colonized*. New York: The Orion Press.
Meneses, M. P. G. (2003), "Agentes do Conhecimento? A Consultoria e a Podução do Cnhecimento em Moçambique," *in* B. S. Santos (ed.), *Conhecimento Pudente para uma Vida Decente: 'Um Discurso sobre as Ciências', Revisitado*. Oporto: Afrontamento, 683–715.
Meneses, M. P. G. (2005), "Traditional Authorities in Mozambique: between Legitimisation and Legitimacy", *Oficina do CES*, 231.
Mignolo, W. (2000), *Local Histories/Global Designs: Coloniality, Subaltern Knowledges and Border Thinking*. Princeton, NJ: Princeton University Press.
Mignolo, W. (2003), "Os Esplendores e as Misérias da 'Ciência': Colonialidade, Geopolítica do Conhecimento e Pluri-versalidade Epistémica," *in* B. S. Santos, (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 631–671.
Mondlane, E.C. (1969), *Struggle for Mozambique*. Harmondsworth: Penguin.
Mooney, P.R. (2000), "Why We Call it Biopiracy", in H. Svarstad e S. Dhillion (eds.), *Bioprospecting: From Biodiversity in the South to Medicines in the North*. Oslo: Spartacus Forlag as: 37–44.
Mora-Osejo, L.E.; Fals Borda, O. (2003), "A Superação do Eurocentrismo: Enriquecimento do Saber Sistémico e Endógeno sobre o nosso Contexto Tropical", in Santos, B. S. (ed.). *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto, Afrontamento, 673–681.
Mosquera, C.; Pardo, M.; Hoffman, O. (eds.) (2002), *Afrodescendientes en las Americas*. Bogotá, ILSA.
Mudimbe, V. Y. (1988), *The Invention of Africa: Gnosis, Philosophy, and the Order of Knowledge*. Bloomington: Indiana University Press.
Nader, L. (ed.) (1996), *Naked Science: Anthropological Inquiry into Boundaries, Power, and Knowledge*. London: Routledge.
Nanda, M. (1991), "Is Modern Science a Western Patriarchal Myth? A Critique of the Populist Orthodoxy", *South Asia Bulletin*, 11, 36–61.
Nanda, M. (1997), "The Science Wars in India," *Dissent*, 44(1).
Nandy, A. (1982), *The Intimate Enemy: Loss and Recovery of Self under Colonialism*. Delhi, Oxford University Press.
Nandy, A. (1999), *Traditions, Tyranny and Utopias: Essays in the Politics of Awareness*. New Delhi: Oxford University Press.
Narayan, K. (1993), "How Native is a 'Native' Anthropologist?" *American Anthropologist*, 95(3), 671–686.
Nkrumah, K. (1965), *Neo-Colonialism: The Last Stage of Imperialism*. New York: International Publishers.
Nunes, J. A. (1998/99), "Para além das 'Duas Culturas': Tecnociências, Tecnoculturas e Teoria Crítica," *Revista Crítica de Ciências Sociais*, 52/53, 15–59.
Nunes, J. A.; Gonçalves, M.E. (eds.) (2001), *Enteados de Galileu? A semiperiferia no sistema mundial da ciência*. Oporto: Afrontamento.
Nygren, A. (1999), "Local Knowledge in the Environment—Development Discourse: from Dichotomies to Situated Knowledges," *Critique of Anthropology*, 19(3), 267–288.
Oyama, S.; Griffiths, P. E.; Gray, Russell D. (orgs.) (2001), *Cycles of Contingency: Developmental Systems and Evolution*. Cambridge, MA: MIT Press.
Petitjean, P.; Jami, C.; Moulin, A. M. (eds.) (1992), *Science and Empires: Historical Studies about Scientific Development and European Expansion*. Dordrecht: Kluwer.

Pickering, A. (ed.) (1992), *Science as Practice and Culture*. Chicago: University of Chicago Press.
Pithouse, R. (2003), "Producing the Poor: the World Bank's New Discourse of Domination," *African Sociological Review*, 7(2), 118–147.
Prakash, G. (1999), *Another Reason: Science and Imagination of Modern India*. Princeton, NJ: Princeton University Press.
Quijano, A. (2000), "Colonialidad del Poder y Classificacion Social", *Journal of World-Systems Research*, 6(2), 342–386.
Raju, S. (2002), "We are Different, but Can We Talk?" *Gender, Place and Culture*, 9(2), 173–177.
Ramalho Santos, J. (2003), "Sobre as Fronteiras," in B. S. Santos (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 511–528.
Ranger, T. (1988), "The Invention of Tradition in Colonial Africa," in E. Hobsbawm; T. Ranger (orgs.), *The Invention of Tradition*. Cambridge: Cambridge University Press, 211–262.
Ranger, T. (1996), "Postscript: Colonial and Postcolonial Identities", in R. Werbner; T. Ranger (eds.), *Postcolonial Identities in Africa*. London: Zed Books, 271–281.
Reardon, J. (2005), *Race to the Finish: Identity and Governance in the Age of Genomics*. Princeton, NJ: Princeton University Press.
Reid, W. V.; Laird, S.; Meyer, C. A.; Gamez, R.; Sittenfeld, A.; Janzen, D. H.; Gollin, M. A.; Juma, C. (1993), *Biodiversity Prospecting: using Genetic Resources for Sustainable Development*. New York: WRI.
Robert, J. S. (2004), *Embryology, Epigenesis, and Evolution: Taking Development Seriously*. Cambridge: Cambridge University Press.
Said, E. W. (1994), *Culture and Imperialism*. London: Vintage.
Santos, B. Sousa (1987), *Um Discurso sobre as Ciências*. Oporto: Afrontamento.
Santos, B. Sousa (1989), *Introdução a uma Ciência Pós-moderna*. Oporto: Afrontamento.
Santos, B. Sousa (1995), *Toward a New Common Sense: Law, Science and Politics in the Paradigmatic Transition*. New York: Routledge.
Santos, B. Sousa (1998), "The Fall of the Angelus Novus: beyond the Modern Game of Roots and Options," *Current Sociology*, 46(2), 81–118.
Santos, B. Sousa (1999), "O Oriente entre Diferenças e Desencontros," *Notícias do Milénio, Diário de Notícias*, 08.07.1999, 44–51.
Santos, B. Sousa (2000), *A Crítica da Razão Indolente: Contra o Desperdício da Experiência*. Oporto: Afrontamento.
Santos, B. Sousa (2001a), "Nuestra America: Reinventing a Subaltern Paradigm of Recognition and Redistribution", *Theory, Culture and Society*, 18 (2/3), 185–217.
Santos, B. Sousa (2001b), "Entre Próspero e Caliban: colonialismo, pós-colonialismo e inter-identidade", in M. I. Ramalho; A. Sousa Ribeiro (eds.), *Entre Ser e Estar: raízes, percursos e discursos da identidade*. Oporto: Afrontamento, 23–85.
Santos, B. Sousa (2001c), "Os processos da globalização", in B. S. Santos (ed.), *Globalização: Fatalidade ou Utopia?*. Oporto: Afrontamento, 31–106.
Santos, B. Sousa (2002), *Toward a New Legal Common Sense*. London: Butterworths.

Santos, B. Sousa (ed.) (2003a), *Conhecimento prudente para uma vida decente: 'Um discurso sobre as Ciências' revisitado*. Oporto: Afrontamento.

Santos, B. Sousa (2003b), "Para uma Sociologia das Ausências e uma Sociologia das Emergências", in B. S. Santos (org.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 735–775.

Santos, B. Sousa (2004a), "A Critique of Lazy Reason: against the Waste of Experience," in I. Wallerstein (ed.), *The Modern World-System in the Longue Durée*. Boulder, CO: Paradigm Publishers, 2004, 157–197.

Santos, B. Sousa (2004b), *Do Pós-moderno ao Pós-colonial. E para além de um e outro*. Opening lecture at the VIII Congresso Luso-Afro-Brasileiro de Ciências Sociais, held in Coimbra, Portugal. Accessed on November 2005, at http://www.ces.uc.pt/misc/Do_pos-moderno_ao_pos-colonial.pdf.

Santos, B. Sousa (ed.) (2005), *Democratizing Democracy: beyond the Liberal Democratic Canon*. London: Verso.

Santos, B. Sousa (ed.) (2006a), *Another Production is Possible: Beyond the Capitalist Canon*. London: Verso.

Santos, B. Sousa (2006b), *The Rise of the Global Left: The World Social Forum and beyond*. London: Zed Books.

Santos, B. Sousa; Rodríguez Garavito, C. (2006), "Introduction: Expanding the Economic Canon and Searching for Alternatives to Neoliberal Globalisation," in B. S. Santos (ed.), *Another Production is Possible: Beyond the Capitalist Canon*. London: Verso.

Schiebinger, L. (1989), *The Mind has No Sex: Women in the Origins of Modern Science*. Cambridge, MA: Harvard University Press.

Schiebinger, L. (1999), *Has Feminism Changed Science?* Cambridge, MA: Harvard University Press.

Shiva, V. (1989), *Staying Alive: Women, Ecology and Development*. London: Zed Books.

Shiva, V. (1993), *Monocultures of the Mind. Perspectives on Biodiversity and Biotechnology*. London: Zed Books.

Shiva, V. (1997), *Biopiracy*. Boston, MA: South End Press.

Simpson, T. (1997), *Indigenous Heritage and Self-determination: the Cultural and Intellectual Property Rights of Indigenous Peoples*. Copenhagen: IWGIA.

Singh, R. S.; Krimbas, C. B.; Paul, D. B.; Beatty, J. (orgs.) (2001), *Thinking About Evolution: Historical, Philosophical, and Political Perspectives*. Cambridge: Cambridge University Press.

Soper, K. (1995), *What Is Nature? Culture, Politics and the Non-Human*. Cambridge: Cambridge University Press.

Spivak, G. C. (1999), *A Critique of Postcolonial Reason: Toward a History of the Vanishing Present*. Cambridge, MA: Harvard University Press.

Stam, R. (1997), "Multiculturalism and the Neoconservatives," in A. McClintock, A. Mufti, E. Shohat (eds.), *Dangerous Liaisons: Gender, Nation, and Postcolonial Perspectives*. Minneapolis: University of Minnesota Press, 188–203.

Stengers, I. (2003), "Para Além da Grande Separação, Tornarmo-nos Civilizados?" in B. S. Santos (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 125–142.

Stiglitz, J. (1999), *Public Policy for a Knowledge Economy. Remarks at the Department for Trade and Industry and Center for Economic Policy Research*. London. Accessed in January 1999 at http://www.worldbank.org/html/extdr/extme/jssp01799a.htm.

Svarstad, H.; Dhillon, S. S. (2000), "Responding to Bioprospecting: Rejection or Regulation?", in H. Svarstad, S. Dhillion (eds.), *Bioprospecting: from Biodiversity in the South to Medicines in the North*. Oslo: Spartacus Forlag as, 9–15.

Takacs, D. (1996), *The Idea of Biodiversity: Philosophies of Paradise*. Baltimore, MD: Johns Hopkins University Press.

Taylor, P. (2005), *Unruly Complexity: Ecology, Interpretation, Engagement*. Chicago: University of Chicago Press.

Visvanathan, S. (1997), *A Carnival for Science: Essays on Science, Technology and Development*. Oxford: Oxford University Press.

Visvanathan, S. (1998), "A Celebration of Difference: Science and Democracy in India," *Science*, 280, 42–43.

Visvanathan, S. (2003), "Convite para uma Guerra da Ciência", in B. S. Santos, (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 717–734.

Wagner, P. (2003), "Sobre Guerras e Revoluções", in B. S. Santos (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 99–116.

Wallerstein, I. M. (1979), *The Capitalist World-Economy*. Cambridge: Cambridge University Press.

Wallerstein, I. M. (2003), "As Estruturas do Conhecimento ou Quantas Formas temos nós de Conhecer?", in B. S. Santos (ed.), *Conhecimento Prudente para uma Vida Decente: 'Um Discurso sobre as Ciências' Revisitado*. Oporto: Afrontamento, 117–123.

Warren, D.M.; Slikkerveer, J.; Brokhensa, D. (eds.) (1995), *The Cultural Dimension of Development: Indigenous Knowledge Systems*. London: Intermediate Technology Publications.

Werbner R.; Ranger, T. (eds.) (1996), *Postcolonial Identities in Africa*. London: Zed Books.

Wilkie, T. (1996), "Genes 'R' Us," in G. Robertson; M. Mash; L. Tickner; J. Bard; B. Curtis (eds.), *Future Natural: Nature/Science/Culture*. New York: Routledge, 133–145.

Wiredu, K. (1996), *Cultural Universals and Particulars: An African Perspective*. Bloomington: Indiana University Press.

WRI (1994), *World Resources 1994–95: People and the Environment*. Washington, DC: World Resources Institute, in collaboration with PNUD.

Zerbe, N. (2002), "Contested ownership: TRIPs, CBD, and Implications for Southern African Biodiversity," *Perspectives on Global Development and Technology*, 1(3–4), 294–321.

Zizek, S. (1997), "Multiculturalism, or the Cultural Logic of Multinational Capitalism", *New Left Review*, 225, 28–51.

Notes

1 While the first two volumes of this collection focused on the political (Santos, 2005) and economic (Santos, 2006a) aspects of the reinvention of social emancipation, the current volume focuses on its cultural and epistemological aspects.

2 The "nation-state" is a concept intensely scrutinized by post-colonial approaches in the light of the political realities prevailing in the global South.
3 Several authors regard post-colonialism as reflecting the condition of Third World intellectuals joining the First World academia (e.g., Dirlik, 1994: 356).
4 Another line of criticism refers to the privileging, in post-colonial studies, of the experience of the territories and populations colonized by England and France, and the relative marginalization of other experiences, such as those of Latin America and the African regions colonized by Portugal and Spain (Dussel, 1995; Mignolo, 2000; Santos, 2001a, 2001b; Chabal, 2002). Scarce attention has been given as well to the colonial condition from a pan-African and pan-Asian ethical critique (Mudimbe, 1988; Nandy, 1999). Despite the limitations noted, see Spivak's critical reflection on the field of post-colonial studies (1999). See also Afzal-Khan and Sheshadri-Crooks' criticism of the "*(pre)occupation of postcolonial analysis*" (2000).
5 Will Kymlicka has produced important work on multicultural citizenship (e.g., Kymlicka, 1995), although within the framework of Western liberalism. For a broader analysis of this question, see Bennett, 1998; Santos, 2002; Dean and Levi, 2003; and Ghai in this volume.
6 Feminist epistemologies—the plural is meant to address the diversity of positions on this matter within feminism—have been central to the critique of the "classical" dualisms of modernity, such as nature/culture, subject/object, human/non-human and the naturalization of hierarchies of class, sex/gender, and race (Soper, 1995).
7 See, for instances of a still growing literature, Santos, 1987, 1995, 2000, 2003a; Pickering, 1992; Lynch, 1993; Jasanoff *et al.*, 1995; Galison and Stump, 1996; Latour, 1999a; Kleinman, 2000; Nunes and Gonçalves, 2001; Stengers, 2003.
8 For recent exemplars, see Galison, 1997; Kohler, 2002; Keating and Cambrosio, 2003.
9 For different approaches to this topic, see Galison and Stump, 1996; Nunes, 1998/99, 2001; Wallerstein, 2003; Wagner, 2003; Stengers, 2003.
10 For different discussions of the "science wars," see Santos, 2003a, 2003b; Gould, 2002. On cultural authority as a stake in this episode, see Nanda, 1997; Fujimura, 1997.
11 On this topic, see Latour, 1987, as well as several of the contributions to Santos, 2003a.
12 On this, see, for example, Oyama, Griffiths, and Gray, 2001; Keller, 2002; Singh *et al.*, 2001; Ramalho Santos, 2003; Robert, 2004.
13 See, on this, Duprés proposal of a "promiscuous realism" (1993, 2003), which has strong affinities with pragmatist approaches (that of John Dewey in particular) earlier explored by Santos (1989).
14 On construction see, for instance, Latour, 1999a, and the contributions to Santos, 2003a.
15 For some relevant contributions to feminist critiques of science, see Keller, 1985; Harding, 1986, 1998, 2003; Schiebinger, 1989, 1999; Haraway, 1992, 1997; and Fausto-Sterling, 2000. Gardey and Lowy, 2000; and Creager, Lunbeck, and Schiebinger, 2001 offer useful overviews, even if focused on the North.
16 There is a wide body of literature revealing the complexity of the crossroads of feminist epistemologies in the South, a subject that is beyond the scope of this Introduction. See, for example, Shiva, 1989; Nanda, 1991; Leach, 1992; McClintock, 1995; Harding, 1998; Jewitt, 2000; Mama, 2001; Raju, 2002.
17 On these debates, see the contributions to Harding, 2003.
18 However, the precise terms of these relationships must be scrutinized, as modern science tends to cannibalize other knowledges, appropriating them as raw materials and turning them into commodities, as Laymert Garcia dos Santos, Vandana Shiva, and Margarita Flórez Alonso discuss in their chapters.
19 On the eve of World War II, colonies and ex-colonies covered about 85 percent of the land surface of the globe. Colonialism played a key role in the transformative encounter for both colonizers and colonized (Loomba, 1998: xiii).
20 Two main sources of criticism of post-colonialism can be identified (Abrahamsen, 2003: 191): a critique that reacts to post-colonialism's rejection of metanarratives and categories such as class, race, and nation; and a critique that objects to its theoretical language and to the focus on text and discourses. By stressing the discontinuities of the colonial and post-colonial periods and emphasizing inquiry into the colonial encounter, post-colonial studies are perceived as a successor of Eurocentric social science. See Ahmad (1992) and Ranger (1996: 273) for instances of this critique.
21 On the implications of the epistemological consequences of the "colonial encounter" see Nandy, 1982; Apffel-Marglin and Marglin, 1990; Asad, 1991; Petitjean *et al.*, 1992; McClintock, 1995; Santos, 1995; Dussel, 1995; Ela, 1998; Mignolo, 2000; and Mbembe, 2001.
22 In the words of Mbembe, the understanding of the "West" emerged simultaneously with the notion of "the rest," where Africa "still constitutes one of the metaphors through which the West represents the origins of its own norms, develops a self-image, and interprets this image into the set of signifiers asserting what is supposed to be its identity" (2001: 2).
23 On the meanings of "alterity from below" (from a broader perspective, including gender, race, and colonial subjectivities) see Narayan, 1993; Raju, 2002; and Masolo, 2003.
24 For different discussions of the epistemological and political implications of ecological approaches to the world, see Latour, 1999b; Leff, 2004; Taylor, 2005.
25 On the critiques of development, see Hobart, 1993; Escobar, 1995; Visvanathan, 1997; Crewe and Harrison, 2002; as well as the introduction to volume 2 of this series, by Boaventura de Sousa Santos and César Rodríguez-Garavito, 2006.
26 Santos (2001c: 71) defines globalized localism as "the process through which a given local phenomenon is successfully globalized." In this sense, the opposition tradition/modernity expresses the outcome of hegemonic globalization, which carried with it the projection of Western science as the sole valid form of knowledge, thus localizing all other knowledges. But "local" refers, here, not to a mere space of reaction to modernity but to spaces of emergence of diverse historical paths, of different modernities, including those that are alternative to the hegemonic one.
27 Describing modern science as a monoculture of knowledge does not mean that it is not internally diverse, as has been shown earlier, but that it takes on this "monocultural" quality in its relations to the range of forms of knowl-

edge and experience regarded as "non-scientific," "local," "lay," "traditional," etc.

28 On this subject, see also Mudimbe, 1988; Alvares, 1992; Bebbington, 1993; Hountondji, 1994, 2002; Dussel, 1995; Santos, 1995, 2002, 2004b, 2006b; Visvanathan, 1997, 2003; Ela, 1998; Mignolo, 2000, 2003; Chakrabarty, 2000; Lander, 2000; Lacey, 2002.

29 Access to these new reproduction strategies and the definition of who provides the "raw materials" for the trade in cells, tissues, and organs are further sources of conflict. These incursions, often in indigenous communities and ecosystems, tend to perpetuate the inequalities associated with the persistence of colonial situations.

30 For the full text, see http://www.biodiv.org.

31 Estimates of the number of actually existing living species tend to vary between 5 and 30 million, with some suggesting up to 80 million. The number of species that have been the object of inventory and inclusion in databases following international scientific conventions, however, is less than 2 million.

32 See, *inter alia*, Reid *et al.*, 1993; Caporale, 1996; Balick *et al.*, 1996; King *et al.*, 1996; Svarstad and Dhillion, 2000; Zerbe, 2002.

33 Vandana Shiva is one of the best-known advocates of this position. See her contribution to this volume.

34 Some promoters and supporters of biotechnology confuse the promotion of biological diversity with the heterogeneity of living beings through biotechnological manipulation, allowing the creation of hybrids, such as transgenic organisms, which did not exist before that manipulation was performed. But biotechnological manipulation is associated, more generally, with a search for the optimization of productivity or of resistance to certain kinds of threats (pests) through techniques such as genetic recombination. This leads to a selection of certain characteristics of organisms and to the dismissal or rejection of others which are not compatible with that search for optimization. The increase in the heterogeneity of living beings tends, thus, to promote the reduction of the diversity of organisms, species, and ecosystems, not their increase. On this controversy, see Kleinman and Kloppenburg, 1991; Shiva, 1993; ETC, 2002; Lacey, 2002.

35 See also Escobar, 2003.

36 On the prospecting of human biodiversity, namely within the Human Genome Diversity Project, see the "Declaration of Indigenous People of the Western Hemisphere Regarding the Human Genome Diversity Project" (in *Cultural Survival Quarterly* 63 [1996]); for discussions, see Hayden, 1998, and Reardon, 2005.

37 On the issue of patents and the fight against HIV-AIDS, see also Klug, 2005.

38 TRIPS—Trade-Related Aspects of Intellectual Property Rights—is the World Trade Organization agreement on matters related to intellectual property rights.

39 In June 2003, the African Group of WTO member countries drafted a proposal for opening TRIPS to traditional knowledge systems, and is seeking its approval by other WTO member states.

40 See Ekpere, 2000, and Egziabher 1999, and in this volume.