Part II

THE WORLD'S LOCAL KNOWLEDGES

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High-Tech Plundering, Biodiversity, and Cultural Erosion: The Case of Brazil

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THE CULTURAL TURN AND THE CYBERNETIC TURN

In the past three decades there has been increasing support for the theory that capitalism is changing by incorporating culture into the production process or even by turning culture into the motor of accumulation. In a way, all discussions in the area of social science concerning the question of post-modernity revolve around what Frederic Jameson has called "the cultural turn." In Jameson's view, if we wish to understand contemporary society, we must first understand how culture has been colonized by capital, and what devastating effects such colonization has on politics, resistance movements, and the quest for emancipation.

Following in the footsteps of Jameson and other authors, Jeremy Rifkin, a shrewd detector of contemporary economic trends, ends his book *The Age of Access* with the argument that global capitalism is not only "knowledge-based" but that, more importantly, by cannibalizing cultures—*all* cultures—it threatens the very foundation of society because it dissolves the planet's cultural diversity through an increasingly intense and rapid instrumentalization (Rifkin, 2000). Rifkin's analysis of the relations between global capitalism and cultural diversity evokes Vandana Shiva's critique of the way "agribusiness" and transnational pharmaceutical and food corporations treat biodiversity (Shiva, 1993). This parallel is not fortuitous: it would seem as if Rifkin had discovered that contemporary economic dynamics lead to cultural erosion, whereas Shiva discovered that the same dynamics lead to biological erosion. From this point of view, economic production takes on a destructive, not to say suicidal, character, and begins to produce destruction.

However, what Rifkin and Shiva see as an eminently negative process is entirely positive to those who support the development in progress. In their view, there is no erosion, only transformation; there is no loss, only gain; and instead of destruction, there is construction. This raises the question: How can erosion mean positive transformation? From what point of view? Based on what criteria? One could argue that Shiva's and Rifkin's world is not the same one referred to by the promoters of global capitalism; it is as if the former were referring to the world that exists, and the latter to a world yet to come. But such worlds are not separate and opposite realities—as if the construction of this new world depended on the erosion of the existing world or, at the very least, its shrinkage.

To understand the world yet to come, one must do more than just understand the "cultural turn" of contemporary capitalism, i.e., the full incorporation of culture into the market system. It would seem that what is much more important than the transformation of culture into commodity is the "cybernetic turn," which sealed the alliance between capital and science and technology, and provided technoscience with the role of a motor of accumulation that will turn the entire existing world into raw material at the disposal of technoscientific work.

"Cybernetic turn" is the term used by Catherine Waldby to refer to the change that occurred in the logic of technology, based on Donna Haraway's description of the reciprocity of information between different organisms, and between organisms and technology:

> Communication sciences and modern biologies are constructed by a common move—the translation of the world into a problem of coding, a search for a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, investment and exchange. [. . .] The world is subdivided by boundaries differentially permeable to information. Information is just that kind of quantifiable element (unity, basis of unity) which allows universal translation, and so unhindered instrumental power (Haraway, 1994, qtd. by Waldby, 2000: 45).

Waldby therefore perceives the cybernetic turn to be this "common move" that occurs in the field of science and technology and that provides the possibility of totally opening up the world to instrumental control through information. But it is obvious that this possibility brought about within laboratories is not limited only to laboratories. The cybernetic turn is not only a change in the logic of technology: it is a change in socio-technical logic.

The concept of information

Scott Lash observes that sociologists (particularly Daniel Bell, Alain Touraine, and Manuel Castells) have viewed the information society as a society in which there is intensive production of knowledge and of a range of post-industrial goods and services. But he thinks that this characterization is insufficient:

> What is key in how we should understand the information society [. . .] is a focus on the primary qualities of information itself. Here information must be understood sharply in contradistinction from other, earlier socio-cultural categories such as narrative or discourse or monument or institution. The primary qualities of information are flow, disembeddedness, spatial compression, temporal compression, real time relations. It is not exclusively, but mainly, in this sense that we live in an information age. Some people have called some of such qualities late-modern (Giddens, 1990), others post-modern (Harvey, 1989), but these concepts seem to me to be too amorphous. Information is not (Lash, 2001).

Lash's merit in expressing his dissatisfaction lies in pointing out the centrality of the concept of information and, above all, its primary qualities. In his view, the key question is to understand what is produced by information production not as goods and services rich in information, but rather as greater or fewer bytes of information out of control. His concern is directed, therefore, at the collateral effects of the systems for conveying messages and the growing impact of these effects on the economy, on politics, on power relations and, last but not least, on theoretical thinking about society. But, although his characterization of the primary qualities of information is based on the cybernetic concept of information, he does not discuss how this concept, developed in the field of science and technology, can be transplanted to the field of the social sciences.

After all, what information is this that is capable of bringing about a radical change in the logic of technology and, at the same time, have such a tremendous impact on contemporary society that one is justified in talking about an information era and an information society?

In his short introduction to Norbert Wiener's paper presented at the conference on "Le concept d'information dans la science contemporaine," the philosopher Gilbert Simondon noted, in regard to the importance of the publication of *Cybernetics, Theory of Control and Communications in the Animal and the Machine*:

> We soon realized that this was something new that would provide the starting point for a new era of reflection. Some thought it was the renewal of

> Cartesianism, others realized that there was the desire to constitute a unity in the sciences, whereas throughout the beginning of the 20th century there had been an increasingly greater separation between scientific specializations; it so happened that after World War II, the *no man's land* between the sciences, the *boundary regions* [. . .] were regarded as extremely fertile fields; and whereas scientific specialization stood in the way of communication, if only because of the different languages used among specialists of different sciences, cybernetics, on the other hand, was the result of several men working as a team and trying to understand each other's language. [. . .] The presence of eminent doctors, physicists and mathematicians on this team revealed that, without a doubt, something was being produced in the sciences that had not existed since Newton, for, as you said, Newton can be considered the last man of science to have covered the entire field of objective reflection. [. . .] In fact, historically, cybernetics arose as something new, with the aim of bringing about a synthesis (Wiener, 1965: 99–100; my italics).

Simondon's words are important because they provide a measure of the relevance of cybernetics not only for the progress of scientific activity but also, mainly, for the field of reflection as a whole. The development of a common language beyond the specificities of the different branches of scientific knowledge and the establishment of a new synthesis, comparable only to the Newtonian revolution, indicated that information theory seemed to take on a central role in contemporary human thought. And this is what we can glean from Simondon's own work. However, Simondon could not simply adopt the notion of information exactly as it had been developed by Norbert Wiener, because this only concerns the transmission of a signal through energy modulation. The information signal is not only what should be transmitted, but also *what should be received*; in other words, it acquires a meaning, it has some efficacy for a whole that has its own way of operating. But such a meaning cannot be found at either the point of exit or the point of entry: information only exists when the emitter and the receiver of the signal form a system; information exists *between* the two halves of a system that had had no sense until then. Information is this aptitude for establishing a relationship that provides a solution, integration; it is the real singularity through which potential energy becomes actual, through which an incompatibility is overcome; information is the establishment of communication, containing an energetic quantity and a structural quality; "it is that through which the incompatibility of an unresolved system becomes the organizing dimension of the solution" (Simondon, 1964: 15).

The technological paradigm and the notion of information made it possible for the ontogenesis of individuation to be pondered in the fields

of physics, biology, and technology, based on a single theoretical reference. In each of these fields, invention comes about when information acts in this pre-individual, intermediate reality, which the philosopher terms "the consistent centre of being." This natural reality, as pre-vital as it is pre-physical, is witness to a certain continuity between the living being and inert matter and it also acts in technical operations. As Simondon states:

> The technical being can only be defined in terms of information and transformation of the different types of energy or information, in other words, on the one hand as a vehicle for action that stems from man to the universe, and on the other hand as a vehicle for information that stems from the universe to man (Simondon, 1989: 283).

Simondon's analysis establishes information as a real singularity that provides consistency to inert matter, to the living being (plant, animal, man), and to the technical object. And it would not be out of place to liken the philosopher's formulation to the brilliant statement by Gregory Bateson, who defined information as "a difference which makes all the difference" (Bateson, 1987: 40–41). The possibility of conceiving a common substratum to inert matter, to the living being, and to the technical object progressively erases the frontiers established between nature and culture by modern society. What is more, everything takes place as if there was a plane of reality in which matter and human spirit could meet and communicate, not as external realities placed in contact with one another but as systems that have become a part of a solution process that is immanent in the plane itself. If technology is the vehicle for an action that stems from man to the universe, as well as of information that stems from the universe to man, it is the solution factor of an intense dialogue in which what counts is interaction, the productive character of agency, and not the pre-existing parts. The basis of the cybernetic turn is therefore man's capacity to "speak" the language of the "consistent centre of being," to gain access to the molecular plane of the unlimited finite in which, according to Gilles Deleuze, a finite number of components produces a practically unlimited diversity of combinations (Deleuze, 1986: 140).

It so happens that the exercise of this intense dialogue of man with nature, this mutual involvement in a common becoming, is still understood, even by scientists themselves, in Baconian terms, in other words, in terms of the unrestricted domination of nature (including human nature) by man, which also means, we should point out, that it is understood in terms of an extreme extension and intensification of instrumental control. This converts dialogue into an exercise of power still propelled by a kind of thinking that Simondon characterizes as the autocratic philosophy of technology, which uses the

machine only as a means to conquer nature and aims at domesticating the forces of nature through primary subjection: the machine as a slave used to enslave others (Simondon, 1969: 126–127).

From this perspective, the cybernetic turn becomes the quintessence of control and domination by converting the means of access to the molecular plane of the unlimited finite and to the digital and genetic information plan into a weapon against nature and cultures—*all* cultures—with the exception of technoscientific culture. This obviously causes a reaction of alarm against the "state of cybernetic nature" and the "state of cybernetic culture," about which Hermínio Martins, in the footsteps of Serge Moscovici, tells us:

> If we are already living within the horizon of the "state of cybernetic nature," which can be adequately summarized as "nature-as-information," we can also say that we are moulding and being moulded, increasingly so, by that which we can call by analogy the "state of cybernetic culture," when culture becomes culture-as-information. This is particularly obvious in the case of the paradigmatic cognitive culture, natural science or technoscience, although it should be noted that, for several decades, this cybernization of science was almost completely confined to military science (during the Cold War). [. . .] Nowadays, it is said that, as a result of increasingly numerous roles [. . .], a lot more has been done than joining an additional technological front to the *instrumentarium* of scientific investigation, at least in the physical and life sciences. Instead, it would seem more appropriate to speak of nothing less than the emergence of a third form of science, as has been suggested by some researchers (Martins, 2000: 25).

The cybernetic turn, as it is occurring now, therefore disqualifies all cultures, including modern culture, in favor of technoscientific culture because the reductionism of the Baconian model prevails. But would there have to be opposition and conflict between contemporary technoscientific culture and other cultures? The entire work of Gilbert Simondon revolves around demonstrating the need to rethink the technological paradigm and the concept of information beyond the autocratic philosophy of technology. But as there does not seem to be much support for this effort, it may be worth our while to take a longer look at what technoscientific practice has valorized.

Technoscientific knowledge and the value of control

In a study of the relationship between science and technology, the philosopher of science Hugh Lacey observed that scientific understanding involves representing phenomena as products of an underlying order, and, therefore,

the abstraction of phenomena as objects of experience, value, and practice. "Scientific understanding is gained through practices that involve both observation of and active interventions into the phenomena, practices that are conducted under what I call the *materialist constraint/selection strategies*" (Lacey, 1999: 15). Why—inquires Lacey—undertake an investigation conducted according to materialist constraint/selection strategies? Among the three possible answers, that which stands out is the one that meets the interests of Baconian utility: the understanding obtained through materialist strategies increases the human capacity to control nature. The philosopher recognizes that it is part of human nature to control nature, but notes that in modernity control has taken on such proportions, pre-eminence, and centrality that it has become a superior and virtually unsubordinate value.

In the modern value scheme of control, Lacey continues, the expansion of the human ability to control nature, the exercise of control, and the implementation of new forms of control are valued above all else, and all projects and institutions that express rival values should be subjected and adapted to them. On the other hand, social values that tend to reveal themselves in the same institutions in which control is manifest, such as private property for example, are reinforced by this association. So much so that the modern value scheme of control seems to have no limits in either the natural world or the social world.

Lacey sees an elective affinity between the materialist strategies of scientific research and the modern perspective of control. He writes:

> The modern value scheme of control cannot be manifested unless the world is amenable to be controlled by human action. [. . .] So if things are or can become like the way they are represented under the materialist strategies, they can become objects of control—*provided that* we can directly manipulate the relevant initiating events and ensure that the relevant boundary conditions remain in place. [. . .] I do not know whether or not the control schemata of traditional knowledge can all be re-articulated within materialist understanding. Whatever the case may be, materialist understanding leads us to schemata that far transcend traditional constraints, so much so that in modern practical life it is virtually uncontested that possible objects of control are considered as objects of materialist understanding. Materialistic understanding grasps objects in the way they need to be grasped so as to become objects of control (Lacey, 1999: 21–22; my italics).

Lacey's analysis is relevant because it allows us to understand how a relationship is forged in which the world is *for* control, in other words, how the phenomena that are objects of materialist understanding are virtually identical to objects of control. In addition, it is obvious that traditional knowledge

remains on the sidelines of this relationship and is not even acknowledged. Finally, it is worth pointing out that this identification between the materialist strategies of science and the world they seek to control feeds the dialectics between theoretical and technological development within research institutions. In fact, in the eyes of this philosopher, this dialectic can only unfold in societies whose institutions and policies recognize and sanction the modern value scheme of control—which has become particularly marked with the ascent of neoliberalism.

But the picture would not be complete if the relevance of materialist metaphysics were left out. According to Lacey,

> This metaphysics affirms that the world "really is" such that all the objects in it (including human beings) are fully characterizable by materialist (perhaps ultimately physicalist) properties and relations [. . .]; all phenomena in terms of being generated in accordance with underlying structure, process and law; and the possibilities of things are exhausted by their material possibilities. [. . .] In principle, all other options seem to be ruled out, for materialist metaphysics implies that our interactions with the world cannot be understood in any other way. It also supports that, where practices of control bring with them undesirable or unexpected side-effects, in principle they can be dealt with through further controlling interventions (Lacey, 1999: 25–26).

The circle closes. It would seem that there is no alternative to modern technical and scientific knowledge, that there is no option outside metaphysics and materialist strategies, much less outside the value scheme of control. As Lacey himself points out, his explanation binds materialist understanding to the latter internally. And yet, it is widely held that science has no values, that it is value-free. How then can we reconcile such an apparent contradiction?

The strong point of Lacey's work is that he confronts modern science with values. He reminds us that the conception of science as value-free consists of three components: impartiality, neutrality, and autonomy. His thorough demonstration establishes that science, although impartial, is not neutral. This is not the place to follow his arguments step-by-step. But we do need to highlight the exact moment at which he captures the way in which the movement of scientific research itself breaks with neutrality and makes the value of control stand out against other values.

The whole question revolves around the relationship between social values and cognitive values. As Lacey observes, it is important to keep the roles played by both separate, since they occur at different logical moments. Thus, when we ask why a certain theory is accepted, we know that the answer involves taking into account cognitive values and data, but not social values. Conversely, when we ask why the scientific community privileges theories aligned with certain strategies of selection and constraint, we know that the answer includes reference to social values. This leads Lacey to emphasize the need to keep the roles played by social values and cognitive values separate. Lacey takes up the question of human flourishing, which usually legitimizes all scientific practice and research. From a modern point of view, the value scheme of control proposes to intensify human flourishing. However, this is contested by feminist and environmentalist perspectives, and particularly by popular movements in underdeveloped countries. Lacey's focus is precisely on the latter.

In summary, the value of control, the pillar of scientific theory and practice, is not universal; there is no consensus about its supremacy. This means that the option to develop modern science and technology as an option for increasingly greater control of nature, seen from other perspectives, becomes the object of controversy. Science chooses what to study objectively, according to cognitive values, but this choice always already presupposes that the value of control is undeniable as a form of human flourishing.

Biodiversity, technoscientific culture and traditional cultures

After undermining the neutrality of science and questioning the value of control, Hugh Lacey goes even further in his discussion by examining the relations between science and development in order to inquire into the possibility of an alternative. He takes as an example the case of agriculture, as conceived by the Green Revolution and the biotechnological revolution on the one hand, and by agro-ecology on the other (Lacey, 1998: 141–151; Lacey, 2000, 2001). This problematic finds a strong echo in the analyses of Shiv Visvanathan.

In a stimulating text, the Indian sociologist conceives science as a mode of violence carried out by the "Laboratory State," the project for which was contrived by the trio of Bacon–Descartes–Hobbes, and which is based on four hypotheses:

1. *The Hobbesian project*, which is the conception of a society based on the scientific method;

2. *The imperatives of progress*, which legitimize the use of social engineering on all those objects defined as backward or retarded;

3. The *vivisectional mandate*, where the "Other" becomes the object of experiment which, in essence, is violence and in which pain is inflicted in the name of science;

> 4. The *idea of triage*, combining the concepts of rational experiment, obsolescence, and vivisection—whereby a society, a subculture or a species is labelled as obsolete and condemned to death because rational judgement has deemed it incurable (Visvanathan, 1997: 17; my italics).

In Visvanathan's understanding, the combination of these four theses makes the project of the Laboratory State a project of genocide (Visvanathan, 1997: 17), and makes modern development "development-as-terrorism" (Visvanathan, 1997: 46). Let us take as an example the question of agriculture, the author's object of research in another essay in the same book. How does modern technoscientific culture deal with biodiversity and traditional cultures that have been developing methods and practices of cultivation for millennia? Visvanathan explores the destructive character of the Green Revolution, with its ferocious dedication to disrespecting the rhythms of nature and disqualifying the knowledge, practices, and innovations of traditional cultures. But what really attracts attention in his analysis is the way he reads modern biologists, including the great "defender" of biodiversity, Edward Wilson. Take, for example, the forest in Wilson's *Biophilia*. Visvanathan writes:

> The forest is not a "dwelling," in the Heideggerian or even tribal sense. Wilson inhabits the forest but does not dwell in it, nurturing it, preserving it or merely watching it unfold: he inhabits it as a field biologist. The forest as a whole does not exist. One senses that before he has even entered it, it has already been resolved into a cluster of research programmes.
>
> In *Biophilia*, there is a split-level sense about the loss of the forest. There is, first, the danger to man's biological need for the forest, and there is also the threat of the constant advance of science. To scientists like Wilson, the forest is literally a magic well from which science can draw endlessly. The forest is information (Visvanathan, 1997: 54).

Wilson feels that the extinction of species and the loss of genetic variability are the worst things that could happen to us, since evolution would take millions of years to correct them. And yet, Visvanathan observes, science seems not to lament this daily death; it seems to have no ritual for this kind of mourning: the scientific conception of time would not allow science to deal with the different temporalities of ecology, which in turn would require the unraveling of the notions of time contained in concepts such as extinction, death, obsolescence, and memory; in short, a clarification of how science relates to nature and to other cultures. Conceived as a system of information from a reductionist viewpoint, the forest is only of interest as long as it has not yet been abstracted, classified, and fully known. What is not clear is how this same conception facilitates the process of extinction.

THE STRUGGLE FOR ACCESS TO BIODIVERSITY AND KNOWLEDGE

The first part of this text has sought to characterize the importance of the cybernetic turn in contemporary society and how the concept of information has become central in the relations that technoscience establishes, not only with nature, but also with other cultures. This second part aims to show how, throughout the 1990s, the conflict unfolded between the different conceptions regarding the access to and the use of biodiversity and the traditional knowledges associated with it.

As everyone knows, in the mid-1980s deforestation propelled the Amazon Forest into the center of the world ecological debate, and actually led to the emergence of the very concept of biodiversity, posing a new question. All of a sudden, the entire world discovered that tropical forests are the richest habitats in terms of species on the planet, while it also discovered that these same species run the greatest risk of extinction. At the same time, the advances of technoscience, and of biotechnology in particular, began to explain the important roles that genetic resources were meant to play in the economy of the future. Thus, even before Rio-92, the question of access had already been brought up.

In a paper written in 1993, in which I tried to demonstrate why Brazilian environmental policy was at a crossroads, I noted that the so-called "war of genes" had already made an appearance in the preparatory meetings for the Rio conference (Santos, 1994a: 152 ff.). At the time, the developed countries supported the thesis of free access to genetic resources, arguing that plants and animals are *res nullius* and that biodiversity is *res communis*, that, in other words, since they belong to everyone, they are not the property of anyone. Brazil defended, obviously, the thesis that access should be regulated by agreement, at the discretion of the country that has biodiversity, based on the principle of the sovereign right of the state over the natural resources located within its territory. According to the Brazilian diplomats, if genetic resources were a "global patrimony," so too should be the products deriving from the very existence and transformation of the genetic patrimony. In short, access to genetic resources should correspond to the transfer of biotechnology and other types of technology that take part in conservation.

As everyone also knows, the Convention on Biological Diversity established, at Rio-92, the sovereignty of countries over their genetic resources. Meanwhile, the day after the conference ended, the same President Collor who had signed the multilateral agreement sent Congress a bill for patents that sought to open access to biodiversity without any corresponding compensation. The bill was widely criticized by the opposition, non-governmental organizations, the scientific community, the national phar-

maceutical industry, the unions, the Catholic Church, and even by some state research institutions. In February 1992, organized civil society had established the Forum for Freedom of the Use of Knowledge, which conceived the issue as a trade war and tried to block the adoption of a law that would authorize the patenting of food, medicine, and especially living beings. In turn, Brazilian exporters, transnational corporations, a large segment of the media, and a considerable number of high-ranking federal officials supported a permissive law, while the United States exerted heavy pressure and threatened to impose new sanctions on the entrance of Brazilian products into the US market. Finally, on 6 May 1993, within the context of opening up the Brazilian market to globalization, the House of Representatives (Câmara dos Deputados) approved a new industrial property law, which, although it prohibited patenting plants and animals, allowed the patenting of microorganisms, "providing they are to be used solely for a specific process that generates a specific product." This became known as a "virtual patent." Later sanctioned by the Federal Senate, the patent law instituted the protection of access to the processes and products generated by technoscience, and by the biotechnology industry in particular (Santos, 1998: 29). Access to genetic resources was yet to be regulated.

David Hathaway, from the non-governmental organization AS-PTA (Consultancy and Services for Projects in Alternative Agriculture), who followed the entire process in the legislature, notes that the Brazilian authorities and the government politicians steadfastly refused to discuss the implications of patenting biotechnological processes used to research, develop, and use genetic resources—they were more concerned about satisfying the interests of transnational corporations. He adds that, furthermore, the government had no plans to regulate such access (Hathaway, 1993: 2–3). This negligence went on for years, which is curious to say the least, if we consider that Brazil is the number 1 country in mega-diversity! Meanwhile, some sectors of the environmentalist movement (such as the Socio-Environmental Institute [Instituto Socio-Ambiental] and AS-PTA) did not feel the same way, and tried to awaken Brazilian civil society to the importance of the matters of socio- and biodiversity. It seems to me that, among the several initiatives of the time, the fact that David Hathaway and myself took part in the "International Conference on Redefining the Life Sciences," organized by The Third World Network in Penang, Malaysia, from 5 to 12 July 1994, took on some relevance.

The conference invited the participants to shift the center of discussion on the loss of biodiversity by moving the focus from the South to the North—in other words, to shift from the relationship between genetic erosion and underdevelopment to the relationship between erosion and development; furthermore, it replaced the discussion of the old causes of unsustainable exploitation of natural resources (lumbering, panning, extensive farming, and cattle raising) with a look at the new predatory force. The change in focus showed that the new predators were "high-tech," since they used science, whose development is based on the extremely operative systematization of knowledge about life; biotechnology, whose performance involves the project of transforming living beings into raw material; and intellectual property rights, the legal system of which seeks to grant legitimacy to the economic appropriation of the active principles of living beings. Thus, the change in focus meant having to admit that it was more important to prepare to fight high-tech violence than to simply fight against the old extraction practices, since the predatory force now seemed to feed directly off the diversity of life forms in order to keep expanding and evolving (Santos, 1994b).

Within environmental circles the need to resist the patenting of life was obvious. But this did not appear to be enough. In Brazil, the prestige of science and biotechnology remained intact, and it was disturbing to see that most of those who fought against the patent system claimed that the country should have the right to exploit biodiversity according to the same criteria. In other words, in Brazil the new intellectual property law was being contested in the name of the very same modern project for exploiting nature, which ignored the value of the traditional knowledge of indigenous peoples and their right to preserve, use, and develop biodiversity. Now, this was precisely the issue that several participants at the conference, especially Vandana Shiva, from India, Tewolde Egziabher, from Ethiopia, and Gurdial Singh Nijar, from Malaysia, wished to debate.

In his presentation at the conference in Penang, the lawyer Gurdial Nijar took up the central issues of the paper he had prepared for the Second Session of the Intra-governmental Committee of the Convention on Biological Diversity, held in Nairobi at the end of June of the same year (Nijar, 1994). His presentation brilliantly articulated: 1) the relationships between the systems of knowledge of indigenous peoples and communities and the protection of biodiversity; 2) the progress of discussions in international forums that concerned the recognition of the rights of nations, farmers, and indigenous peoples in regard to biodiversity; 3) the search for a legal framework that would allow access to genetic resources and relevant traditional knowledge to be regulated; 4) the struggle against the patenting of life forms; 5) the issue of biosecurity. For many participants, this was the first time the matter had been laid bare with its main implications at the local, national, and international levels. But the Third World Network's lawyer had more than just a deep understanding of the matter; his analysis led to a proposal he was interested in discussing with the participants from countries rich in biodiversity.

Nijar started off with the observation that throughout history biodiversity has been shared as a common good among local communities, which freely exchange both the resources and their knowledge of them. In his view, biodiversity and the different local systems of knowledge have a symbiotic relationship: people live off nature while at the same time helping it to develop, which can be seen both in the management of forests and in traditional agriculture. This relationship is broken by modern commercial agriculture, which favors monoculture, uniformity, and productivity—symbiosis gives way to erosion, both of biological diversity and of knowledge. It is therefore crucial to understand the link between the preservation of biodiversity and the knowledge and practices of local populations, i.e., their understanding of and their ethics concerning conservation. Since it is impossible to protect the former without defending the latter, Nijar proposes that both be considered together for the purposes of legislation.

In recognizing the sovereign rights of states over their natural resources, article 15 of the Convention on Biological Diversity discarded the principle of "common patrimony," while at the same time determining that the states should try to create conditions "to facilitate access to genetic resources for environmentally sound uses," while upholding the three objectives of the convention: the conservation of biodiversity, the sustainable use of its components, and fair and equitable sharing of the benefits derived from the use of genetic resources. Finally, the convention recognized that both the access to and the transfer of technology are essential to attaining these objectives. But, after a closer look at article 16, Nijar concluded that its wording "is far from clear. It is therefore open to interpretation and definition" (Nijar, 1994: 9). Article 16 deals with the matter of intellectual property. Article 16.2 establishes a distinction between patented and non-patented technology. "In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights." But non-patented technology does not have the same protection. In the well-known article 8(j), the convention recommends that each contracting party "should, as far as possible and as appropriate," in keeping with national laws, "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices." Where, then, does that leave the protection of non-patented technology? According to Nijar,

> What emerges from a review of the international developments and debates is that there is an acknowledgement that farmers' and indigenous peoples' rights are essential for the conservation and protection of biological diversity, and that this emanates from the recognition of their diverse systems of knowledge and innovation in biological resource improvement and utilization; and that equity demands a sharing of benefits. However, *what emerges equally clearly is that the existing international mechanisms are not entirely supportive of this understanding*. The search for a coherent legal framework advancing this understanding is therefore of crucial importance for the preservation and protection of these critical values (Nijar, 1994: 9; my italics).

Exploring the gaps in international mechanisms that in one way or another concern the issue of access to genetic resources and its associated knowledge, Nijar then proposed the adoption of a *sui generis* protection regime, which, in contrast to intellectual property rights, would take into account the intellectual rights of indigenous peoples and local communities. Nijar recalled that the TRIPs agreements required the member countries of the World Trade Organization to ensure the protection of plant varieties through a system of patents or an effective *sui generis* system, or a combination of the two. The question that arises is this: How should we interpret the term "effective"? If we look at the term as it appears in Section 301 of the United States Trade and Competitiveness Act, it reinforces the protection of patents; but "effective" can also mean coherent and consistent with the spirit and terms of the Convention on Biological Diversity, which strongly encourages the parties to create "conditions to facilitate access to genetic resources for environmentally sound uses" (art. 15.2), to respect, preserve, and maintain the knowledge, innovations, and practices of the indigenous peoples and local communities (art. 8[j]), and to promote the development and use of indigenous and traditional technologies (art. 18.4).

Working within the parameters of the World Trade Organization and the Convention on Biological Diversity, Nijar suggests that a *sui generis* regime for protecting "community intellectual rights" should do the following:

> —allow an alternative definition of knowledge systems, capable of recognising the system of informal, collective and cumulative innovation of indigenous peoples and local communities;
> —define innovation in such a way that it would include not only the technologically improved final product but also knowledge about the use of properties, values and processes of any biological resource, as well as any plant variety or any plant (or part of it). Such a definition should also be broad enough to include any alteration, modification, improvement or obtaining of by-products that use the knowledge of indigenous groups or

communities in the marketing of any product, and should also include any more sophisticated process for extracting, isolating and synthesizing chemical agents in biological extracts and in the compounds used by indigenous peoples;

—turn the indigenous peoples and local communities into the guardians of these innovations, defining such rights as "non-exclusive" and "non-monopolistic" and encouraging their free and non-commercial use and exchange;

—allow such rights to be guaranteed in conjunction with other indigenous peoples and communities (Nijar, 1994: 16).

Nijar justified the adoption of the *sui generis* regime thus:

> The evolutionary process was in fact used in the service of industrial capitalism. The intellectual property system of the 19th century was a product of the industrial revolution and the inability of normal property law to protect the ideas of mechanical inventors. Plant breeders' rights is a product of the 20th century development of Mendelian genetics and the inability of intellectual property systems to protect the idea of breeders. So, too, community rights [. . .] is a product of the era of biotechnology and the inability of other systems, in the context of new biotechnologies, to protect the ideas of informal innovators (Nijar, 1994: 17).

Nijar pointed out that the main objective of his proposal was to prevent the privatization and usurpation of community rights and knowledge through the existing definitions of innovation. In my view, his lucid conception of the predatory relationship that technoscience had been establishing with traditional knowledge helped him to understand that everything revolved around the terms "property" and "innovation." For this very reason, his proposal of a *sui generis* regime ruled out the possibility of traditional knowledge being exclusively appropriated, and he redefined the concept of innovation so that it would reflect the unique character of knowledge production on the part of indigenous peoples and local communities.

The radical opposition to the patenting of life and the defense of the genetic resources of the indigenous peoples and the local communities that had assimilated traditional knowledge, innovations, and practices found an echo in all of those who saw high-tech predation as a kind of ultimate plunder, not only because of the critical content of Nijar's proposal, but primarily because he put forward arguments and a positive agenda that went against the legal interests and traps formulated by state officials and by corporate lawyers to regulate the matter of access to genetic resources in national law. In addition, the fact that his *sui generis* regime interlinked

protection and access gave a precise content to the exercise of national sovereignty over biological resources. Sovereignty would no longer be a merely rhetorical aspiration, given that the national state would be the entity that would ensure the conditions required for the preservation and sustainable use of resources, the equitable distribution of the benefits provided by their use in industry, and, above all, would make it impossible for such resources to be exclusively appropriated and monopolized, as this would harm both the communities and the country. By protecting the communities against biopiracy and by regulating the access to biological resources, the state would be limiting the attempt to appropriate life, which, as mentioned before, would accelerate the erosion of biodiversity. For this very reason, the Third World Network's proposal as a whole was embraced with much interest in several Third World regions, and began to be discussed in all of the Latin American countries that have a large amount of biodiversity: Colombia, Ecuador, Venezuela, Peru, Bolivia, and, last but not least, Brazil.

The concern over the socio-environmental dimension of access

Vandana Shiva, Tewolde Egziabher, and Gurdial Nijar put together the proposal concerning collective intellectual rights because they felt that the trend in international forums was to favor the intellectual property regime, and also because they realized that countries rich in biodiversity should not wait for an international legal framework to be developed and then try to fit into it; quite the opposite, they thought that it was up to the southern countries to come up with new solutions in their national laws in order to defend their biological and cultural wealth.

The idea of legislation that would protect collective intellectual rights by means of a *sui generis* regime spread to some groups in Latin America. After discussing the regime in a broad process of consultation with indigenous and black communities as well as with NGOs, the Ad Hoc Biodiversity Group of Colombia (Grupo Ad Hoc de Biodiversidad da Colombia) drafted a bill on biodiversity (Holguín, 1996: 118–176). Taking up the matter in the Brazilian context, Senator Marina Silva submitted bill 306/95 to the Federal Senate, which included contributions from Brazilian NGOs and the Colombian discussion.

Both in Colombia and in Brazil, the starting point for the debate about collective intellectual rights was the acknowledgement of the differences among cultures. In fact, such rights are only conceivable if the state and national societies legally recognize the unique character of traditional peoples. This is the case of the Colombian Constitution of 1991, which recognized the nation's pluri-ethnic and pluri-cultural character, and of the Brazilian Constitution of 1988, which recognized as "collective rights,"

among others, the right to socio-diversity (art. 215.1), the right to cultural heritage (art. 216), the right to an ecologically balanced environment (art. 225), and the right to biodiversity (art. 225).

The jurist Carlos F. Marés de Souza Filho defines collective rights as those

> whose principal characteristic is the fact that their ownership is not individualized and is not certain or cannot be ascertained. [. . .] [T]his characteristic sets them apart from the concept of individual rights as conceived by the contractualist or constitutionalist culture of the nineteenth century because these are rights without a subject! Or, to put it in an even more confusing manner for individualist thinking, everyone is a subject of these rights. If all are entitled to the same rights, all have access to them, but, at the same time, nobody can have access to them, because one person's access would be a violation of the rights of all (Souza Filho, 1999: 176).

Marés notes that as of 1988 this new class of rights was included in the constitution, even though doctrine and jurisprudence are still reluctant to call them by this name. This means that although there is already a formal framework in which collective rights are included, there is still a long way to go before the legal existence of these rights becomes a reality. On the other hand, this same constitution established something of great import for the formulation of collective intellectual rights, namely article 231 of Chapter VII, which recognizes the "original rights" of indigenous societies to the land they have traditionally occupied. Original rights have two extremely important characteristics in regard to the matter at hand: first of all, they are collective rights, which concern communities and/or societies; second, these rights do not regard land as the property of Indians: the land belongs to the Union, but its permanent, inalienable, and irrevocable use belongs to the communities and/or societies. It would be a good idea to explore the articulation between collective intellectual rights and the original rights of indigenous societies to the land, as a way of binding land, knowledge, and innovation in a legal and coherent whole. If it were a case of really protecting biodiversity and its resources, as well as of actually respecting the right to socio-diversity, then this might be the best alternative. However, this articulation has not been investigated.

In the mid-1990s, when Senator Marina Silva presented her bill, whoever wished to fight for a law to protect biodiversity and its associated knowledge needed to discuss whether to opt for intellectual property rights or for collective intellectual rights; in addition, one also had to face, in a critical and inventive manner, the relationship of this law with a permissive patent law, with a government bill on cultivated varieties that sought to extend similar rights to those of patents (as indeed later became the case), and with the bill

on the status of indigenous societies, which was to replace that concerning the status of Indians, which was obsolete in the context of the 1988 Constitution, and which provided for the recognition of collective intellectual property and even guaranteed the right of the communities to request a patent for invention based on their collective traditional knowledge. The centrality of the conflict between intellectual property rights vs. collective intellectual rights was, therefore, evident. But at the time, as is still the case today, there was very little clarity in this respect.

Let us take a look at Marina Silva's proposal. First of all, I would like to point out that it was a woman, from the state of Acre, a senator for the Workers' Party, a militant from the social and environmental Amazon movements, and Chico Mendes' companion in the *empates* (those daring actions in which the men and women of the forest tied themselves to rubber trees to prevent deforestation), who introduced the issue of the importance of the protection of biodiversity and traditional knowledge to the Brazilian Parliament. Presented to the Senate on 26 October 1995, bill 306/95 officially opened the debate on a subject that had until then been a resounding non-issue. In presenting the motives that explained her initiative, Marina Silva went straight to the point: "biodiversity is power. Do not forget the heated controversies that currently influence international relations (a paradigmatic example is the legal regulation of genetic patenting) and which pertain to the field of biodiversity" (Silva, 1996: 15).

Senator Marina Silva's project was an invitation for civil society to participate, and, accordingly, public audiences on the matter were held in Brasília, São Paulo and Manaus. Article 1 of the bill takes up the constitutional provision to preserve the diversity and the integrity of the country's genetic patrimony, and states that such preservation should abide by eight principles: 1) sovereignty over resources; 2) the participation of the local communities and indigenous peoples in the decisions; 3) national and local participation in the benefits derived from access; 4) priority for undertakings carried out within the country; 5) the promotion of and support for the different forms of generating knowledge and technology; 6) protection of and incentive to cultural diversity, valorizing the knowledge, innovation, and practices of local communities; 7) biosecurity; 8) the guarantee of individual and collective rights to the knowledge associated with biodiversity. The bill, therefore, revealed a strong socio-environmental concern. It subordinated economic interests to the three basic points stated in the preamble of the Convention on Biological Diversity: the conservation of biodiversity, the sustainable use of its components, and the fair and equitable distribution of benefits. Linking bio- and socio-diversity, Marina Silva dedicated the whole of Chapter IV to the protection of knowledge. But she did so using the notion of collective rights of intellectual property, to be regulated later by

law. The bill stated the need for specific protection that took into account the knowledge of indigenous peoples and local communities, but the form such protection should take was left for society to discuss. And at the time it seemed that collective intellectual property was the most that could be envisioned within the Brazilian context: I myself, in a letter to the senator on 8 November 1995, commented on the different articles and suggested that the law establish "*sui generis* intellectual property rights" (?!), which reflected my still precarious and confused understanding of the Third World Network's proposal.

This equivocation persisted. In October 1997, the state of Acre approved a bill on access to genetic resources inspired by the one submitted by Senator Silva, which, in its article 41, recognizes and protects "the rights of local communities to collectively benefit from their traditions and knowledge and to be compensated for the preservation of biological and genetic resources, either through intellectual property rights or other mechanisms." The law does not recognize individual intellectual property rights regarding genetic resources when the collective knowledge of local communities is used; but the notion of collective intellectual property rights exists side by side with collective intellectual rights (Bill 15/97 of the State of Acre). In its turn, the Amapá law (the only Brazilian state with a government plan for sustainable development), approved on 29 October 1997, ensures "remuneration for access to the collective intellectual rights" (*sic*) of traditional and indigenous communities, among others (Bill 0039/97 of the State of Amapá). Also at the end of 1997, Senator Osmar Dias's amendment substantially reformulated bill 306/95, shifting the emphasis from the local to the national plane, depleting its socio-environmental dimension and giving primacy to the economic, not to say purely commercial, sense of access to genetic resources and relevant knowledge. From the start, in article 2, the amendment considers genetic resources and their by-products as *public goods of special usage*, which caused great controversy among jurists, environmentalists, and indigenous activists because the ownership of the goods, as defined here, would seem to entitle the Union to a right that would go against the Indians' exclusive use of their natural resources as established by the constitution. This shift in emphasis also occurred in several other articles, to the point of changing the spirit of the law: the amendment seemed more intent on stipulating the conditions of access (and contract) than on affirming rights. In addition, the protection of traditional knowledge seemed to boil down to a question of "fair and equitable" compensation for benefits, which is the same as saying that the right to knowledge can be negotiated.

Oblivious to the *sui generis* regime, the amendment showed a lack of awareness about the fact that the Gordian knot of access lay, not in access as such, but in the limitation of what industry can do with what is accessed.

Article 5.V states that the rights to traditional knowledge held by the local community or indigenous population are inalienable, unseizable, and irrevocable, but that they may be used, provided that prior, justified permission is obtained and that just and equitable compensation is given. Everything would therefore seem to indicate that traditional knowledge cannot be patented. However, article 41 contains a contradiction: those applying for intellectual property that is based on genetic resources or on the traditional knowledge of local communities or indigenous populations should obtain prior and informed consent. In addition to this, the amendment stated that the intellectual property rights for products or processes pertaining to traditional knowledge associated with genetic resources or their by-products would only be recognized if the access were legal!

The same ambiguities appear in bill 4579/98, presented to the House of Representatives the following year by representative Jacques Wagner of the Workers' Party. The new version contained some important positive differences, since it defined the ownership of genetic resources as *goods of public interest*, reaffirmed the exclusive use by the indigenous communities of the natural wealth located on their lands, and recognized the right of the indigenous and local communities to deny access to resources and knowledge whenever they felt it would threaten the integrity of their heritage. In short, as noted by Juliana Santilli in her evaluation of the bills, "such initiatives are still tentative and imprecise"; a *sui generis* regime for protecting collective intellectual rights should be based on several premises, which include:

> I) the express provision that any patents or any other intellectual property rights [. . .] granted for processes or products resulting directly or indirectly from the use of the knowledge of indigenous or traditional communities are null and void, as a way of preventing an exclusive monopoly on the same. [. . .] 3) the express provision that traditional knowledge may not be patented would allow the free exchange of information among different communities, which is essential to the very generation of such knowledge (Santilli, 2001: 58).

The concern over the marketing of resources and knowledge

While some sectors of the opposition and civil society debated the matter, the Federal Government, through the Inter-Ministerial Group for Access to Genetic Resources (GIARG), formulated a bill of its own, which was sent to the House of Representatives on 20 August 1998. Coordinated by a representative of the Ministry of the Environment and supervised by the Civil Office of the Presidency of the Republic, the GIARG was composed of members of the Ministries of Industry and Trade, Foreign Affairs, Justice,

Health, Agriculture, Science and Technology, the Navy, and Public Administration, as well as by members of the Oswaldo Cruz Foundation, the National Indian Foundation, the Brazilian Institute of the Environment, the National Institute of Industrial Property, and the Brazilian Company of Agricultural Research. Its mission was to analyze and submit a proposal for the improvement of Senate bill 306/95.

GIARG stated that it decided to work on a new bill "mainly by reason of the need to make the Executive responsible for defining the responsibilities of its organs, something which could not be done by the Legislature" (Message no. 98, 1998: 2). The statement is surprising in the aggressiveness with which it dismisses the prerogatives and responsibilities of the parliament, by claiming a right to legislate, which would later be carried out by a provisional measure. But the government's arrogance did not end there: its project went against the initiatives already presented, not only because it was discussed behind closed doors, but also because it ignored the socio-environmental aspect, one of the main concerns of the sectors of civil society involved in the process. In fact, the emphasis was now being placed on the economic, technical, and scientific aspects, incorporating the dominant logic in developed countries and in the industry of biotechnology.

The government's access project was accompanied by the proposal of a constitutional amendment that intended to include genetic patrimony among the goods of the Union, "in order to allow the state to preserve its diversity and integrity and to oversee the entities dedicated to the research and manipulation of genetic matter" (Message no. 977, 1998: 1). This would, therefore, in keeping with the text of the Convention on Biological Diversity that establishes national sovereignty over biological resources, put genetic patrimony on the same standing as wealth found in the subsoil; in other words, it would make it a national good. As Carlos Marés rightly noted at a meeting of the Socio-Environmental Institute (Instituto Socio-Ambiental), which discussed the first version of the government's bill in September 1999, the objective of the proposed amendment was to open up the possibility of economic access and exploitation of genetic patrimony, something that had hitherto been hampered by the very same article 225 that requires the preservation of its integrity! The amendment would therefore solve the problem of a law that ran the risk of clashing with the constitution. But the matter does not end here: the inclusion of genetic patrimony in article 20 is justified by the intention to preserve it; however, when one reads the accompanying government bill, it is obvious that it deals not with the patrimony but with its components. As Carlos Marés commented at the time, the problem to be solved is the legal access to the components, in other words, the need to guarantee the use of something that falls outside the protection of the law. The intention, he concluded, is to create a new right.

The proposed constitutional amendment intended to turn biodiversity into the genetic patrimony of the Union. But one has to understand that biological beings would not become goods in the hands of the state: the very justification of the reasons behind the amendment highlights the fact that care must be taken "not to confuse them with the rights already established by Brazilian legislation regarding the material and immaterial property of biological resources, which are commonly used in the activities that involve their economic exploitation, such as agriculture and animal husbandry, the agricultural industry or agribusiness in general." Basically, the Union would "only" hold rights over the genetic patrimony. But what exactly is genetic patrimony?

The chapter on definitions reads:

> I.—Genetic patrimony: information of genetic origin, contained in all or part of a vegetable specimen, including those that are domesticated or semi-domesticated, microbial or animal, in substances to be found in the metabolism of these living beings and in extracts obtained from these living or dead organisms, found *in situ* or kept in *ex situ* collections, provided they have been retrieved *in situ*, within the national borders, on the continental shelf, within territorial waters or within the exclusive economic zone.

This definition deserves comment. First of all, we should highlight the fact that all biodiversity has been reduced to its molecular dimension—genetic patrimony is considered to be a stock of information. Second, such a reduction implies the total absence of the notion of a living being; in addition, matter is exclusively understood as raw material, as a means for biotechnological transformation. Lastly, if genetic patrimony is a stock of information, of discrete units, this means that the Union owns a virtual good! But why would the Brazilian government want to claim ownership of such a good? If we recall that genetic information is made equivalent to the minerals found below ground we soon find the answer. The patrimony is only in the hands of the nation until it is appropriated; as Carlos Marés argued, "national patrimony is the idea of it in nature." Once its ownership has been passed on to someone else, that person can access the virtual information, modify it, patent it, and sell it on the global market.

The access bill was therefore a legal formulation that left out the value of the use of genetic resources and opened up the possibility for technoscience and corporations to exploit their informational value. By regulating something that was not yet available and creating a new right, the law would deal with a good that could not be mistaken for any other regulated good, tangible or intangible. Because it dealt with access to virtual components that could be valorized, the bill could afford to state that the material or

immaterial property rights that applied to the component accessed or to the place in which it was found would be respected. By regulating the ownership of the information, the law would be perverse: apparently all the goods and all the rights acquired would remain untouched; in practice, however, the goods will be devalued and the rights diminished, but this will only become evident when the valorization of the biotechnological processes and products reveals that the exchange value and informational value have become synonymous, and when the right to intellectual property has made explicit the way in which it interferes in the exercise of other rights.

The bill also stated that the benefits from the economic exploitation of the product or process developed from a sample of the component of the genetic patrimony would be fairly and equitably shared with the Union. In fact, no one knows what the bill considers to be "fair and equitable," since it merely says that the division will be based on a "percentage to be defined in later legislation," when the genetic component is collected on indigenous lands. The state is therefore responsible for defining the value of the informational raw material that will be "transferred" with the property right.

Thus, a close look at the government bill reveals that the state interpreted the exercise of sovereignty over the genetic resources as the prerogative to decide on its own how and under what conditions to sell the virtual information it would own. By equating genetic resources with mineral resources, the government bill attempts to place the animals, plants, and microorganisms found on indigenous lands outside the sphere of the 1988 Constitution. As we have seen, the bill states that the exclusive use by the indigenous communities of the natural wealth to be found on their land will be respected, because the constitution so stipulates. But since these are not considered natural wealth, but rather something to be found virtually within it, the approval of the bill would mean that genetic components would be excluded from exclusive use.

Virtualization of resources and fragmentation of knowledge

In October 1999, two months after the approval of the amendment to bill 306/95 in the senate, the government proposed a merger of the three bills into one amendment. Chapter V of this version is dedicated to the protection of the traditional knowledges associated with the genetic patrimony. All three articles and the many paragraphs of this chapter echo all of the important questions raised by the renowned article 8(j) of the text of the Convention on Biological Diversity: exclusive rights of the indigenous and local communities to their traditional knowledge; access preceded by prior, informed consent; sharing of benefits; and the right to deny access. The crowning glory of all this, article 24, chapter VII, reads: "Processes or

products obtained from access to the traditional knowledge associated with the genetic patrimony may not be patented."

Apparently, therefore, this bill was a major step forward, despite the fact that it discarded the possibility of a *sui generis* regime. But a less daring examination of the matter shows that the mentality governing the thinking of government officials has not changed that much. Obviously, the prohibition of patenting contained in article 24 is commendable in that it prevents the exclusive appropriation of the genetic components obtained through traditional knowledge. However, it is worth asking if the inclusion of this paragraph was actually to serve some purpose. What is the use of holding exclusive rights over traditional knowledge if article 9, paragraph 8, states that ingress into lands belonging to indigenous or local communities for access to genetic resources in the event of relevant public interest to the nation will not require prior permission from those communities? Article 9 allows for access irrespective of the will of Indians and traditional communities; this, as we well know, clears the way for making the proclaimed right and freedom of choice devoid of meaning.

However, none of the aspects referred to above is the most serious. In my view, the greatest violence lies in the very definition of associated traditional knowledge: "individual or collective information or practice of the indigenous community or local community, with real or potential value, associated to the genetic patrimony." As if the knowledge of these peoples could be translated into discrete units, into bits of information, and still remain traditional knowledge! As if the definition was not, in itself, a testimonial to the predatory appropriation of one culture by another.

Trampling the legislature and civil society: the "Novartis Provisional Measure"

The bills dragged on for years in Congress. Finally, at the end of May 2000, the scandal of the bio-prospecting agreement between the Swiss multinational Novartis and the social organization BioAmazônia broke out. BioAmazônia had been created by the Brazilian state to implement the Molecular Ecology Program for the Sustainable Use of Biodiversity of Amazonia (PROBEM), in other words, to foment the development of bio-industry.

The scandal broke out and grew as the terms of the partnership were revealed, which were considered harmful by the opposition, by the better part of the Brazilian scientific community, and by the press. Criticized even by members of the BioAmazônia Board, who were unaware of the content of the negotiations, the agreement also had its validity questioned by the Minister of the Environment himself: in his view, BioAmazônia was not authorized to sign bio-prospecting agreements or contracts.

The "agreement for cooperation" dealt with the collection and supply of stocks and extracts for a period of three years, and provided for a supplementary project regarding the isolation of purified natural compounds of plants, fungi, of microorganisms. In a far-reaching article, the President of the Butantan Foundation summarized the reasons for such a negative reaction. After pointing out that the greatest value of biodiversity lies in microorganisms, Isaías Raw expressed his amazement at the fact that BioAmazônia thinks it reasonable to isolate, characterize, and sell stocks of Brazilian bacteria at 100 Swiss francs, up to a maximum limit of 1 million Brazilian reais, figures he feels are lower than the cost of upkeep for the association's office in São Paulo. He adds:

> BioAmazônia signs an agreement giving Novartis the exclusive right to request and maintain the protection of a patent to make, produce, use and sell direct compounds and derivatives within the territory (which the contract defines as the world!). In exchange Novartis offers, and BioAmazônia accepts, 500 thousand Swiss francs, while Novartis announces that it is conducting a clinical study with a product derived from Brazilian biodiversity, and another 2,250,000 Swiss francs before the product is launched. In the meantime, Novartis will teach us to be its technicians, collecting microorganisms and fermenting and analyzing the presence of products of interest. We would then have the important task of sending the isolated extracts and compounds, and later sending the stocks. For only 100 Swiss francs per stock, BioAmazônia will have to set up a machine to send 10 thousand cultures to Novartis! (Raw, 2000)

There are many more controversial items to be pointed out in this agreement for cooperation, which essentially boils down to the cheap sale of access to genetic raw material for the biotechnological industry. For this very reason, several voices echoed the harsh words of Isaías Raw, who ended his article by calling the partnership a "spurious agreement that turns the Amazon into a backyard for multinational companies."

Opposition to the agreement grew. In mid-June, Senator Marina Silva asked the Attorney General to investigate its legality. Other bio-prospecting agreements also came to light, including the agreement between Glaxo Wellcome and Extracta, in July 1999. The House set up a committee to speed up the voting on the law of access, and the government pondered the creation of a code of conduct to regulate such contracts. But, at the same time, despite all the fuss regarding the reaction of the Ministry of the Environment, signs began to appear that the government intended to validate the agreement made with Novartis by issuing a provisional measure prepared by the Civil Office of the Presidency and inspired by the government bill.

The news that the "Novartis Provisional Measure," as the regulation of access became known, was to be passed, caused protests from the NGOs, which pointed out the anti-democratic character of the initiative, the disregard of the legislature and civil society, which were being run over in the process, and the legal insecurity the text would bring about, since the provisional measures could be changed every time they were reissued, and could therefore be influenced by specific interests. With a governmental decision imminent, 32 entities and forums of environmental organizations sent an appeal to the President of Brazil, with legal arguments against the issuing of the provisional measure and requesting that the matter be dealt with through a bill.

This was all to no avail: on 30 June 2000, the government passed Provisional Measure no. 2052, conceived in the Civil Office of the Presidency. An attentive look at this measure reveals that it is simply a revised version of the government bill. Article 1 reads:

> This Provisional Measure regulates the goods, rights and obligations pertaining to the access to components of genetic patrimony [. . .], to traditional knowledge associated with it [. . .], to the integrity of the country's genetic patrimony, to the use of its components and the fair and equitable distribution of the benefits derived from its exploitation, as well as the access to technology and the transfer of technology for the preservation and use of biological diversity.

The text does not clearly state that the Union holds the title to genetic patrimony; it only recognizes this tacitly and avoids dealing with the controversial question of the legal nature of this patrimony. However, in article 2 the text confers the exclusive right to exercise sovereignty over these resources to the Union. It also retains the definitions that allow the virtualization of biodiversity so that it can later be objectified as a private good, and confirms the possibility of patenting life, thanks to the distinction between genetic resource and biological resource. But worst of all is the violation of the rights of the indigenous peoples guaranteed by the constitution.

In an attempt to appear to respect and uphold the principles of the Convention on Biological Diversity in regard to the protection of traditional knowledge, the provisional measure dedicates its entire chapter III to this matter. In this chapter the state recognizes the rights of indigenous and local communities to decide on the use of their traditional knowledge associated with the country's genetic patrimony. However, in article 8, this right begins to be undermined: paragraph 4 states that protection cannot be interpreted in such a way as to prevent the use of this traditional knowledge, and paragraph

5 states that protection cannot affect, damage, or limit any other type of right to intellectual property. Article 10 grants pardon to biopirates by establishing that "any person of good faith who, up until 30 June 2000, used or economically exploited any of the country's traditional knowledge, will be entitled to continue to use or exploit such knowledge." Lastly, article 9 concerns the ability of indigenous and local communities to prevent the unauthorized use of their traditional knowledge; however, since this article does not specify how they can prevent the action of third parties, and since paragraph 5 protects intellectual property, the entire chapter dedicated to the protection of traditional knowledge is devoid of meaning.

As if that was not enough, other articles of the provisional measure go even further. Article 14 reiterates that in cases of relevant public interest, so defined by the competent authority, the entry into indigenous land to gain access to genetic resources does not require prior consent from the indigenous and local communities. Carlos Marés and the Attorney General, Aurélio Rios, point out that this article ignores the need for prior and informed consent. Furthermore, this article is unconstitutional on two counts. In the first place, it would violate article 231 of the constitution, which establishes the Indians' entitlement to the exclusive use of the natural resources located on their lands (we have already seen that such an interpretation can be contested if we take into account that we are not dealing with natural resources, but virtualities to be found in them). Second, the constitution determines that the public interest should be regulated by a complementary law, but article 14 of the provisional measure describes what constitutes an abuse. The allegation of exemption in cases of relevant public interest is absurd because in principle there is no such thing as irrelevant public interest; moreover, since neither relevant cases nor the authority competent to define such relevance are specified, any entity will do—or, seemingly rather, an Inter-Ministerial Committee made up of members of the Civil Office of the Presidency, far removed from the sectors of civil society and the entities directly involved in the matter. Lastly, article 14 of the provisional measure completely depletes the negotiating conditions of the indigenous peoples as to the distribution of the benefits referred to in article 21: if the Indians are not "reasonable" during negotiations, the state representative can always invoke "relevant public interest" in order to fit them in—or to exclude them.

In truth, the authorities, who appear so liberal when negotiating with Novartis, harden when it comes to the purveyors of resources. Article 28 puts an end to the issue of the rights of indigenous peoples to their resources and knowledge by making these freely patentable, since in order to gain the right to the industrial property of a process or product obtained from a sample of the genetic patrimony all one has to do is provide information as to the origin of the material and the traditional knowledge collected.

INCONCLUSION

Since June 2000, the provisional measure has been reissued by the government and challenged wherever and whenever possible. In August, the National Confederation of Agricultural Workers (Confederação Nacional dos Trabalhadores na Agricultura—CONTAG) filed a Direct Suit of Unconstitutionality (ADIN no. 2289/00) put together by the lawyers of the Socio-Environmental Institute, questioning the constitutionality of articles 10 and 14. Realizing the legal fragility of these articles, the Civil Office of the Presidency altered them in the revised version of the provisional measure on 27 April 2001, suspending the general amnesty granted to those who already had exploited traditional knowledge, and revoking the free entry into indigenous lands in cases of relevant public interest. This latter question should now be regulated by a complementary law and not entrusted to the Management Council for Genetic Patrimony (Conselho de Gestão do Patrimônio Genético).

This retreat shows that the government only pays attention to the point of view of the communities as a last resort. For this very reason, the struggle continues within Congress to approve one of the bills. In any case, even with the provisional measure, the question of access to genetic resources and associated knowledge remains unresolved: since it was passed, bio-prospecting has been legally paralyzed in Brazil because the management council has not yet been created; at the same time, the governing bodies are divided over whether the genetic patrimony should be considered a good of the Union through the proposed constitutional amendment—some sectors interpret this as a limitation of the right to property. That is why it has not yet been possible to vote on the amendment and transform the provisional measure into law, as the executive branch would like[1].

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Note

1 By the end of 2005, the question remains an open one — even though Marina Silva becomes then the Minister of Environment of President Lula's government, she is fiercely opposed by the Ministers of Agriculture, Industry and Commerce, and Science and Technology.