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BIOCOLONIALISM AND THE COMMODIFICATION OF KNOWLEDGE

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INTRODUCTION

The ideology of the market, and the omnipresence of market forces, have left an indelible mark on the Western conception of knowledge. Aided and abetted by the Western legal system, and most strikingly by the rise of intellectual property law, knowledge has undergone a steady process of commodification. This is particularly true of knowledge produced in the microworld "factories" of Western biotechnology, which have become crucial outposts in the establishment of an international intellectual property rights regime. As capitalism moves from an industrial to a global information economy, it continues to regenerate itself. Wealth, as Christopher Lind (1991: 71) observes, is created

not primarily from the manufacture of industrial goods, but from the generation of ideas and information. As existing pools of capital seek to capture the new sources of wealth, debates about intellectual property are moving to center stage.

This chapter contends that this conjunction of Western law and biotechnology facilitates an ongoing biocolonialism, particularly with regard to Indigenous peoples.

If colonialism encompasses the interlocking array of policies and practices (economic, social, political, and legal) that a dominant culture can draw on to maintain and extend its control over other peoples and lands, then biocolonialism emphasizes the role of science policy. The introduction of monocultures and the attendant undermining of plant genetic diversity (via "development" debacles such as the Green Revolution)

one form that biocolonialism is taking. However, this chapter addresses instead diverse forms of extractive biocolonialism – where valued genetic resources and information are actively sought, "discovered," and removed to the microworlds of biotechnoscience. There they are legally transformed into the private intellectual property of corporations, universities, and individuals, rendered as commodities, and placed for sale in genetic marketplaces such as the American Type Culture Collection. In this manner, the commercial seed industry and the pharmaceutical industry have commodified the plant genetic resources and traditional medicines of Indigenous peoples, along with their agricultural and medicinal knowledge. The controversy over the Human Genome Diversity Project, and the commodification of the cell-lines of Indigenous peoples, is only the most recent phase of this struggle.

This chapter aims to advance that struggle by tracing various issues and historical processes which are pivotal in the debate over biocolonialism. The commodification of knowledge, and the collusion of intellectual property law, are central to my discussion. I suggest that Indigenous resistance to biocolonialism, and notably the strong critiques that have been made of the Diversity Project, derive in part from a refusal to construe certain types of knowledge as commodities. For many Indigenous peoples knowledge of the natural world, especially medicinal and agricultural knowledge, is only properly construed as a gift.

Whether knowledge is regarded as a commercial exchange in the marketplace or as the reciprocal exchange of gifts, an understanding of power relations is integral to understanding of knowledge systems. As several recent science theorists (Rouse 1987) have argued, questions of knowledge cannot be divorced from those of power. Plainly, biocolonialism, and Indigenist¹ critiques of it, cannot be adequately assessed without appreciating how power figures in the epistemological debate and, conversely, how divergent construals of knowledge enter into the political debate. Accordingly, I draw on current accounts of knowledge and power in science to illuminate and strengthen the critique of the Diversity Project and to illustrate how power relations inflect the dynamics of Indigenous and Western knowledge systems. Since law itself is a central factor in the knowledge/power equation, I illustrate how Western legal concepts of "originality" and "innovation" embedded in intellectual property law are not only sharply at odds with their Indigenous counterparts, but are primed to serve the interests of biocolonialism.

DIVERSITY AND SOLIDARITY

We are many / We are one.

(Jaune Quick-to-See Smith)

Some vexing terminological and conceptual issues will remain submerged in my discussion of these matters. Although I do not address these in detail here, I invite and encourage discussion of them. For example, I will often contrast Indigenous with Western knowledge systems. The notion of a knowledge system underscores the

heterogeneity of knowledge; certainly it deserves closer attention. (For a beginning, see Marglin 1990; Deshler 1996.)

The nature and terms of the contrast also need to be carefully considered. There are multiple ways of comparing and contrasting knowledge systems. My own preference for "Indigenous" and "Western" as terms of the contrast is mainly political. This contrast, and that between dominant and subordinated knowledge systems, underscores the role of power within, and the power differential among, knowledge systems. Other commonly adopted options – articulate/tacit, theoretical/practical, scientific/traditional – seem questionable and objectionable, especially insofar as they are intended to reflect differences between forms of knowledge within Indigenous and Western cultures. (See Heyd 1995; Agrawal 1995a; and Agrawal's commentators (IKDM 1996b) for some discussion of these issues.)

Nevertheless, I hasten to emphasize the diversity and non-unitary character of both "Indigenous" and "Western." There are differences within, and similarities across, Western and Indigenous knowledge systems which confound any attempt to cast the contrast as a simple dichotomy. Moreover, given the global presence of some 5,000 distinctive Indigenous cultures, it is crucial to acknowledge the specific circumstances that have shaped and differentiated the knowledge systems of these peoples, and that continue to do so. It would, however, be historically and politically myopic to see only differences. There is much that binds Indigenous peoples together. Most frequently noted is a shared experience of oppression, or a relationship to particular lands which carries with it certain moral responsibilities. As artist Gail Tremblay (Iroquois/Micmac) observes, each of us

comes from a people who has also had the experience of facing the forces of colonization by outsiders and has been subjected to attempts at physical and cultural genocide. Each knows the pressure to assimilate to other cultural patterns, and the pain of loss that has been handed down across the generations of people since contact. . . . So it is that coming from such diverse cultures, we can join together to say, *we are one*. (Tremblay 1997)

In the words of Aboriginal author Mudrooroo (1995: v-vi):

We are many mobs with many countries, but we have become mixed up. We were put together without thought for our differences and our attachment to our countries. . . . Us Mob are many mobs, but we all come from that great tree which is Australia. . . . We are a singularity in diversity.

The recent Treaty of Indigenous Peoples International (1997), which creates a political, social, and economic alliance among the diverse Indigenous peoples across the Pacific Rim, declares as its first two principles that:

- A The Creator has made us part of and spiritually inseparable from the environment. This truth brings us together.
- B We share a cultural legacy of natural conservation and protection stemming from our inherent obligation to protect the land, water and natural resources within our traditional territories.

There are shared conditions, shared responsibilities, and a shared struggle. To succeed in that struggle, Indigenous peoples are increasingly responding to a common oppression, forming organizations of resistance such as the World Council of Indigenous Peoples, the International Indian Treaty Organization, the South and Meso American Indian Rights Center, and the American Indian Movement (AIM), among many others. As AIM activist Ishgooda (Wyandotte) notes: "When we divide our people of the First Nations, by location, by blood quantum, by tribe, by traditional animosities, we kill that which we seek to preserve" (personal communication, 1997).

THE "COMMODIFICATION" OF KNOWLEDGE

The commodity fiction handed over the fate of man and nature to the play of an automaton running in its own grooves and governed by its own laws.

(Karl Polanyi)

While the market and market forces of late capitalism differ substantially from those envisaged by Adam Smith, they continue – notably under the banner of intellectual property law – to transform the legal system in ways that impact directly the Western conception of knowledge. Just as land and labor were metaphorically transformed to accommodate a market economy, so too is knowledge – human intellectual labor – being transformed by what Polanyi calls a "commodity fiction."

Various commentators have noted how the market doctrine obtained political and philosophical hegemony over Western society by pointedly ignoring the distinction between commodities and noncommodities. Commodities, for the economist, have a specific origin and purpose. They are manufactured goods which are produced for sale, sold, and eventually consumed. Since human labor – intellectual or manual – is not manufactured for sale and consumption, it is not a commodity, strictly speaking: It is not a product, but a

personal, intimate and intrinsic part of ourselves. Human work cannot be separated from the whole person. . . . it is a market fiction that there is a separation between the human and human work. We can no more sell our work than we can sell ourselves. (Kimbrell 1993: 269, 270)

Nor, of course, is land – a part of nature – a commodity that is produced by people for sale and consumption.

Yet to leave work and nature out of the market equation would challenge the market system. As Andrew Kimbrell observes:

If market ideology was to be the central law of a society. . . . it had to extend to all important aspects of life. . . . Vital noncommodities had to be subsumed under the definition of commodity, treated like any other commodity, and subjected to the supply-and-demand laws of commodities. (1993: 270)

So, it was convenient to ignore the distinction between commodities and noncommodities. This metaphorical transformation of labor and land into "fictitious commodities" also greatly enhanced the power of the market system, facilitating control of virtually all aspects of social behavior and natural resources. Karl Polanyi recounts this transformation, and its full impact:

The crucial step was this: labor and land were made into commodities, that is, they were treated *as if* produced for sale. Of course, they were not actually commodities, since they were either not produced at all (as land) or, if so, not for sale (as labor). Yet no more thoroughly effective fiction was ever devised. . . . The true scope of such a step can be gauged if we remember that labor is only another name for man, and land for nature. (Polanyi 1968: 61-2)

The transformation and commodification of knowledge – of human intellectual labor – was part of this process. Knowledge is not produced by people for sale and consumption. And despite the tendency of recent work in science studies to speak of knowledge production and knowledge products, knowledge is not a product. Such talk merely reflects the effectiveness of the knowledge-as-commodity metaphor. Like manual labor, intellectual labor is a "personal, intimate and intrinsic part" of human beings. To paraphrase Kimbrell, human knowledge cannot be separated from the whole person; it is a market fiction that there is a separation. We can no more sell our knowledge than we can sell ourselves.

When market assumptions are extended to ideas, to information, intellectual property results. Patents, copyrights, and trade secrets are protections that the state gives to innovations – to new ideas (Hettinger 1989: 35). These types of property rights are intended to provide for ownership of "noncorporeal, intellectual objects, such as writings, inventions and secret business information" (1989: 31) that can be bought and sold in the marketplace. Private intellectual property restricts the use of ideas through patents, the expression of ideas through copyrights, and the methods of acquiring ideas through trade secrets.

The rise of intellectual property has also helped to transform the Western conception of knowledge in another way. Scholarly, as well as popular, conceptions of knowledge (see R. Roberts 1987; Fuller 1991) have regarded it as non-exclusive – as existing in many places at once and as not consumed by use: "the possession or use of [such] an intellectual object by one person does not preclude others from possessing or using it as well" (Hettinger 1989: 34). However, when it is commodified, and rendered as intellectual property, information becomes exclusive, and its value is seen to lie in part in that exclusiveness. The point of owning a song, or certain genetic information, is to ensure and secure exclusive profits.

Intellectual property laws serve as means of transforming Indigenous knowledge and genetic resources into profitable commodities, and of advancing the commodification of nature. For example, the chief of the Global Environment Division of the World Bank, discussing traditional plant knowledge in the Ethiopian Coptic Church, recently proposed: "Let's screen that knowledge stock... [and] explore how it might be

commercialized" (cited in Bereano 1995). Indigenous representatives to the Commission on Sustainable Development have challenged the practice of bioprospecting, and the global imposition of Western intellectual property laws. Victoria Tauli-Corpus (1993) offers a compelling description of the cultural politics of science unfolding here, and of the contrasting metaphors of knowledge which help to sustain them:

We have witnessed how indigenous seed varieties and medicinal plants which our women and healers have preserved and developed, were appropriated by international and national research institutes and transnational corporations. . . . Without our knowing, these seeds and medicinal plants were altered in laboratories and now we are told that the companies have intellectual property rights over these genetic plant materials because they have improved on them. This logic is beyond us. . . . we, indigenous peoples . . . have developed and preserved these plants over thousands of years. (1993: 25)

Another particularly disturbing aspect of this debate is that the patenting of genetic information is simultaneously the patenting of life-forms, since the innovations in question are based upon and produce life-forms. A 1995 report to UNESCO's International Bioethics Committee notes: "Genetic material is seen as part of what constitutes life; as such, patenting transforms this material into a commodity that can be owned and traded in" (1995, section 2.3.2). Commenting on this phenomenon, José Silva (1995: 57) observes that "genetic property rights subject nature to worldwide commodification, an important step in the ongoing biotechnological revolution." This is not limited to plants, of course; it involves nonhuman animals as well. According to the Office of Technology Assessment, well over 190 genetically engineered animals (these include fish, cows, mice, and pigs) are "figuratively standing in line to be patented by a variety of researchers and corporations" (Kimbrell 1993: 198). It also involves human animals, people, who are treated as sources of genetic information. As Okanagan activist Jeanette Armstrong (1995: 11) states: "it is not only knowledge about plants and animals that is being made a commodity: the essential substance of the human life-form – human gene-lines – are now items for transnational trade and profit."

An instance of this, which has provoked widespread Indigenous resistance, is the Human Genome Diversity Project (HGDP), an international undertaking by scientists, universities, private researchers, and governments to create thousands of cell-lines from DNA collected primarily from Indigenous peoples. The controversy surrounding the Diversity Project has been vigorous and substantial from the Project's outset, when the targeted sample populations were referred to as "Isolates of Historic Interest" (J. Roberts 1993: 675 – see Harry 1995; Whitt 1997, for more discussion of this).

The Diversity Project's Indigenous critics charge that "this is just a more sophisticated version of how the remains of our ancestors are collected and stored in museums and scientific institutions" (Tauli-Corpus 1993: 26). According to an article in the prestigious journal *Science*, whose advocacy of this Western science project has been unremitting:

As [Indigenous] people vanish, they are taking with them a wealth of information, buried in their genes about human origins, evolution, and diversity. . . . Already, there are indications

of the wealth of information harbored in the DNA of aboriginal peoples. (L. Roberts 1991: 1614)

Concerns about patenting and commercial exploitation have been repeatedly voiced: "How soon will it be before they apply for intellectual property rights to these genes and sell them for a profit?" (Tauli-Corpus 1993: 26). And as John Liddle, director of the Central Australian Aboriginal Congress, observes:

If the Vampire Project goes ahead and patents are put on genetic material from Aboriginal People, this would be legalized theft. Over the last 200 years, non-Aboriginal people have taken our land, our language, culture and health – even our children. Now they want to take the genetic material which makes us Aboriginal people as well. (Nason 1994: 3)

GIFTS AND COMMODITIES

Labor should not be sold like merchandise but offered as a gift to the community.

(Che Guevara)

The nature, depth, and force of Indigenous opposition to biocolonialism, and especially to the Diversity Project, is poorly grasped by advocates of these extractive initiatives of Western science – whether corporate or academic.² It is frequently assumed that once proper informed consent documents, material transfer agreements and database access agreements have been drafted, and the "hysteria" whipped up by "professional alarmists" subsides, opposition to the Diversity Project will and should dissipate (Moore 1996: 62). At the least, it should be effectively disarmed. At best, Indigenous people will realize, finally, that "they should be *grateful* to us."³ Such assumptions can be sustained only by wrenching certain Indigenist critiques from their contexts. Some of the most substantive objections to the Diversity Project, and to biocolonialism more generally, contend that life-forms, and Indigenous knowledge of the natural world, are gifts; they must not be privatized, commercialized, and commodified.

This section contrasts a Western commodity conception of knowledge with the construal of knowledge as a gift which is prevalent in many Indigenous knowledge systems. I do not suggest that all knowledge within all Western and Indigenous knowledge systems conforms to these divergent metaphors of commodity and gift.⁴ Certainly within the West there has been resistance to life-form patents on analogous grounds. Similarly, some Indigenous peoples have embraced such patents, to varying degrees and with varying degrees of consensus and reluctance. As Greaves (1994: 6) notes, "the arena of Western institutions is played in when the stakes are high and there is no other choice." Knowledge systems, whether Western or Indigenous, are neither monolithic nor static; they are varied and changing, far more so than my discussion here will reflect.

Nevertheless, these diverging metaphors of knowledge do capture tendencies and features which are typical of, or prevail in, many Indigenous and Western knowledge systems. Moreover, they have not only intellectual but social and moral implications for what and how something can be known: metaphors "shape our perceptions and in turn our actions, which tend to be in accordance with the metaphor" (Stepan 1993: 372). These are politically significant insofar as they inform contemporary struggles within Indigenous and Western knowledge systems over biocolonialist policies and practices. Indeed, part of what is at issue in resistance to the Diversity Project is whether or not a particular change should take place within Indigenous knowledge and value systems – a significant change in how certain knowledge is understood and in how it is valued.

Consider Aroha Mead's statement of the basis of Maori opposition to the Project. Many of the Diversity Project's advocates, she notes, "have the mistaken view that the reason for indigenous opposition to the [Project] rests in lack of understanding of [its] aspirations, and confusion over minor details" (Mead 1995). Anyone who has followed the long electronic debate on Native-Net between opponents of the Project and its central apologist – Henry Greely, a Stanford University law professor and head of the Project's North American Ethics Committee – will concur with Mead here. Greely and other Project proponents have repeatedly failed to address – or even to indicate they take seriously – what lies at the heart of Indigenist resistance:

It is difficult to articulate the degree to which the indigenous and Western scientific philosophies differ on such a fundamental point, but... I wish to emphasize that it is the difference in understanding of the origin of humanity, the responsibility of individuals and the safety of future generations which sits so firmly at the core of indigenous opposition to the [Diversity Project]... the fundamental reason is that, according to an indigenous worldview, this type of research proposes to interfere in a highly sacred domain of indigenous history, survival and commitment to future generations. (Mead 1995)

As Mead (1995) explains, the Maori translate the word "gene" as *iratangata* ("life-spirit of the mortals") or *whakapapa* ("genealogy"). So a physical gene is understood to be "imbued with a life spirit handed down from the ancestors." Each successive generation contributes to it, passing it on to future generations. Genes are thus part of the heritage of families, communities, tribes, and entire Indigenous nations. They are not the property of individuals, nor is any part or derivative of them. The innovative manipulations leading to the isolation and storage of DNA segments, and the privatization and commercialization of cell-lines, turn them into such and must therefore be vigorously resisted.

Comparable concerns have been expressed by diverse Indigenous peoples protesting the patenting of traditional medicines and crop varieties, for whom knowledge of the natural world, particularly medicinal and agricultural knowledge, is regarded (like life itself) as given, not produced. There are normative implications to such an epistemological posture. When knowledge is construed as a gift, the *process* of knowing rather than the product of knowledge, and the nature and quality of the relations with the nonhuman world which are constitutive of that process, become central.

To properly engage in a process of reciprocal exchange, of giving and receiving, behavioral constraints must be accepted. The reciprocity of the exchange is to be respected and reflected in one's conduct. These normative constraints are simultaneously ecological and social. The process of knowing must be undertaken in a way that respects and reflects the fact that each individual, each community, each tribe, each nation and species has "a responsibility to the workings of the universe" (Allen 1986: 73), to the generations to come, and to those that have passed. Like knowledge of the natural world, for many Indigenous peoples land itself is a

gift . . . [so] they assume certain ceremonial duties which must be performed as long as they live on and use the land. . . . Obligations demanded by the lands upon which people lived were part of their understanding of the world; indeed their view of life was grounded in the knowledge of these responsibilities. (Deloria 1992: 262-3)

This construal of knowledge and the normative constraints which attend it can be readily illustrated by diverse Indigenous knowledge practices. I emphasize here knowledge of healing, of hunting, and of crop cultivation.

Normative dimensions

There are specific ceremonies and procedures which someone with knowledge of traditional medicine will carefully observe. A traditional healer will typically offer tobacco to the plants being collected. The plant will be addressed and thanked for being there, for allowing itself to be used in healing. Only certain plants will be culled, at certain stages of their life cycles, at certain times of the year and of the day. Diné healer Mae Tso's comments richly demonstrate how conceiving knowledge as reciprocal exchange mediates behavior, what is done in the name of Indigenous science, as well as how it is done:

When you are collecting medicine healing herbs, you have to collect for the individual sick person. You make an offering to the plants in your prayers, you have to know the plant's name, the person's name and the reason. The medicine plants that you have gathered cannot be used for anyone else, nor can they be stored and kept for use at a later time. When you are collecting herbs, you cannot collect them in large quantities. There are specific sacred herbs for all kinds of sickness. . . . All these medicine plants have a specific song and prayer to go along with them. When you collect these herbs, you have to make an offering to them to get the healing spirit of the herbs to work. You have to know the prayers and songs for the herbs to collect them. You only collect what is needed, nothing more or less. (Tso 1988: 328)

The ecological moral she conveys here is echoed in Jake Swamp's account of his training in the gathering of medicinal herbs:

You don't just go out there and pluck it out by its roots and walk away. You have to prepare. You have to know the words that go with it. What I was taught was that when

you see that plant, to first see that it's the one you offer thanksgiving to, that plant is still here with us, still performing its duty and that you wish it to continue. You walk past it and you look for the other one, and that one you can pick. For, if you take that first one, who is to know, maybe that's the last one that exists in the world. (in Barreiro 1992: 21)

The Cree goose-hunter's practice of *pwaatikswaau*, or smoking to the game, expresses a similar attitude and acknowledgment of the gift relationship, or reciprocal exchange, which binds the human to the nonhuman world, and which "constitutes a root metaphor or paradigm for knowledge in general" (Scott 1996: 74). Smoke is an appropriate vehicle of exchange for creatures of the air, while tobacco is a traditional medicine, customarily offered to honor other beings – human and nonhuman – especially when something is being taken or requested. When the hunter is successful and a goose falls, "the gift is respectfully admired by the hunter and later received as a guest into the lodge by the women of the hunter's household" (1996: 82).

Something analogous is evident in the agricultural knowledge practices of Andean peoples, undertaking the cultivation of their *chacras* (plots of land under cultivation). According to Modesto Machaca, "to open a *chacra* I must ask permission of the Pachamama so that she will allow me to work this soil. . . . I tell her that I will cultivate this soil with love, without mistreatment and the fruits she gives me we will all eat" (in Rivera 1995: 25). Cultivating a *chacra* is a reciprocal activity, necessarily involving both humans and the land. It is in this sense that Andean agricultural knowledge is to be seen as tied, or tethered to the land:

To raise a *chacra* is not merely to domesticate plants and animals; it is to nurture lovingly and respectfully, in other words, to nurture ritually, together with plants and animals, the soils, waters, micro-climates and, in general, the whole land. (1995: 24)

All of the activities that go on in the *chacra* – sowing, weeding, hilling, harvesting, and even the storage, transformation, and consumption of harvested products – are ritual activities. These rituals express the Andeans' attitude of love, respect, and gratitude to the earth for its gifts, including the gifts of knowledge regarding how to cultivate a *chacra*.

The process of knowing exemplified by Diné healing, Cree hunting, and Andean farming practices is not exclusively or narrowly cognitive. It is also an evaluative activity, conditioned by respect and gratitude, in which certain normative constraints on knowledge – on what, how, and by whom things are known – are critical. These spring from an acknowledgment that human beings play, and cannot help but play, a fundamental role in the natural world. Humans are, of course, not unique in this.

The knowledge that Indigenous healers, hunters, and farmers are given binds them, and the people they treat and feed, to the land, just as the exchange of gifts between people binds them to one another. The giving of gifts establishes a relationship between those involved; their circulation within the human world, as well as between the human and nonhuman world, acknowledges and enhances community. Those involved in the exchange and sale of commodities, by contrast,

do not look toward the person of each other, but only toward the commodity; there are no obligations of brotherliness or reverence, and none of those spontaneous human relations that grow out of intimate personal community. They all would just obstruct the free development of the bare market community. . . . Such absolute depersonalization is contrary to all elementary forms of human relations. (Weber 1967: 192)

As one commentator observes:

It seems no misnomer that we have called those nations known for their commodities "the free world". The phrase doesn't seem to refer to political freedoms; it indicates that the dominant form of exchange in these lands does not bind the individual in any way – to his family, to his community, or to the state. (Hyde 1979: 67)

Resisting commodification

When something that is a gift is metaphorically transformed and treated as if it were a commodity, the social and moral ramifications are considerable. Aroha Mead's comments (above, and in Mead 1996) demonstrate that part of what Indigenist critics of the Diversity Project are contesting is the desirability and inevitability of just such a transformation. What is ultimately at issue is the transformation of certain kinds of knowledge and certain forms of life into commodities, and the implications of this for Indigenous knowledge and value systems. The Declaration of Indigenous Peoples of the Western Hemisphere Regarding the Human Genome Diversity Project (1995) makes this plain:

We oppose the patenting of all natural genetic materials. We hold that life cannot be bought, owned, sold, discovered or patented, even in its smallest forms. . . . We particularly oppose the Human Genome Diversity Project which intends to collect, and make available, our genetic materials which may be used for commercial, scientific, and military purposes. . . . Our principles are based upon our profound belief in the sacredness of all Creation, both animate and inanimate. We live in a reciprocal relationship with all life.

So too, in the Blue Mountain Declaration (1995) rejecting life-form patenting, we find the following:

The humans, animals, microorganisms and plants comprising life on earth are part of the natural world into which we were all born. The conversion of these life forms, their molecules or parts into corporate property through patent monopolies is counter to the interests of the peoples of the world. No individual, institution, or corporation should be able to claim ownership over species or varieties of living organisms. Nor should they be able to hold patents on organs, cells, genes or proteins, whether naturally occurring, genetically altered or otherwise modified. . . . we call upon the world and the Congress of the United States to enact legislation to exclude living organisms and their component parts from the patent system. We encourage all peoples to oppose this attack on the value of life.

A commodity conception of knowledge assumes certain values and facilitates certain behaviors that are inappropriate or inconceivable when knowledge is regarded as something given, rather than produced for sale. Increasingly, Western technoscience – whether corporate, academic, or governmental – is committed to "producing" knowledge that is to be applied in industry. While there is a growing failure to accept, appreciate, and observe limits to such knowledge-acquisition, the rise of intellectual property regimes does indicate a readiness to limit access to such knowledge in the interests of enhancing its value as a commodity. Biocolonialism arises when this conception of knowledge is conjoined to the scope and power of Western legal institutions committed to extending intellectual property regimes globally.

KNOWLEDGE AS POWER

Most of the really fresh power comes from sciences.

(Bruno Latour)

I have been suggesting that the fierce resistance of Indigenous peoples to biocolonialism is due partly, if not primarily, to the fact that it commodifies, privatizes, and commercializes both knowledge of the natural world and genetic life-forms themselves. The conversion of life-forms into intellectual property – into commodities to be harvested, altered, packaged, and sold – requires that valued genetic materials first be identified and located. The latter is often accomplished by "mining" Indigenous medicinal and agricultural knowledge systems, systems which construe such knowledge as a matter of reciprocity: as a moral transaction outside the marketplace, that must be respected and allowed to remain as such. Biocolonialism's critics regard it as an assimilative process that threatens to transform Indigenous knowledge and value systems, as well as the natural world itself, in unwelcome and lasting ways. To fail to resist it is, effectively, to abandon the responsibilities that accompany reciprocal exchange.

The Zuni, for example, have formed a Cultural Resources Advisory Team to provide guidance concerning Zuni genetic resources. It has declared that Zuni seeds "should not be sold or given to outsiders for profit, resale, breeding or trademarketing" (Soleri et al. 1994: 34). The reason is that if Zuni seeds are transformed into a commodity and sold, the Zuni will no longer know how the seeds will be used. Since they will no longer be under Zuni control, their abuse cannot be prevented.

When a gift is rendered as a commodity, it undergoes a change in metaphysical status that facilitates such loss of control and potential abuse. Gifts are inalienable; when a gift is exchanged the continuity of social relationships ensures that it always remains the giver's. Thus the giver remains in a position to influence and guide the disposition of the gift. Commodities, by contrast, are alienable. When they are exchanged, so is effective control over the disposition of the commodity. The "social distance and independence of the transactors" in the marketplace leaves the seller of the commodity unable to influence its use (Berg 1991: 363).

To convert Zuni seeds from gifts into commodities would not only alter the nature of Zuni communal relationships, it would also result in a significant and irreversible loss of power. The Zuni would no longer be able to monitor and control the use of their seeds, and the generations of intellectual and physical labor that their cultivation represents. They would no longer be able to discharge their moral responsibility to ensure that these gifts not be abused.

Indigenous recognition that a gift-to-commodity conversion process involves a loss of power is widespread, and is not limited to the conversion of genetic materials. It includes the commodification of knowledge. Consider the Maori account of this. The third of the three baskets of knowledge which form the basis of traditional Maori epistemology contains all knowledge of the natural world (agriculture, medicine, astronomy, fishing, crafts, etc.). Such knowledge is considered *tapu* – sacred and set apart, or removed from profane use. Thus, it is treated with special respect. It is also endowed with *mana* or power (Marsden 1992: 121). As a gift from the gods, it is not to be passed on lightly. Above all, knowledge that is *tapu* must never be transformed into a commodity:

our elders never allow us to sell any knowledge of anything Maori that is really *tapu*. To them it is priceless. Money can never buy knowledge and when they teach they will tell people: "This knowledge I am passing over to you must never be sold." (Pewhairangi 1992: 11)

One is responsible for such knowledge and for how it will be used, or misused: "A *tapu* involves a restriction, and in the case of *tapu* knowledge this requires making sure that the knowledge does not fall into the wrong hands" (Patterson 1992: 164). Should this happen, the knowledge will lose its *tapu*, and thereby its power:

There is . . . a fear that by giving things out they could be commercialized. If this happens they lose their sacredness, their fertility. They just become common. And knowledge that is profane has lost its life, lost its *tapu*. (Manihera 1992: 9)

Like many other Indigenous peoples, the Maori have long recognized that knowledge and power implicate one another. Recently, work in philosophy of science and science studies has also stressed that questions of knowledge and power "do not belong to distinct domains of inquiry, and that answering each requires sustained attention to the other" (Rouse 1991: 665). Indigenist responses to biocolonialism and especially the Diversity Project have focused on just this issue, so vital to understanding the political dynamics mediating Indigenous and Western knowledge systems. In the remainder of this section I look briefly at some of this recent work on knowledge and power in Western science, show how it helps to illuminate certain processes that are at work in biocolonialism, and how it may be used to enrich critiques of the Diversity Project in particular.

The politics of science

Joseph Rouse (1987, 1991) has developed a detailed alternative to the conventional understanding of the role of knowledge and power within Western science. It addresses

important aspects of power relations, and of the production and assessment of knowledge to which the standard account fails to do justice. Rouse points out that while knowledge and power have both been regarded as things which agents acquire, possess, and use, they have also been taken to constitute analytically distinct domains of human inquiry. The domain of knowledge includes representations, while the domain of power consists of human actions. These two domains interact in a particular way: "power may suppress knowledge, or distort it ideologically; it may also provide resources needed to achieve or accelerate knowledge acquisition, which in turn may augment power" (1991: 658). According to his alternative account, the details of which will not concern me here, knowledge and power are not distinct domains of things, but rather

interconnected ways of posing questions to and concerns about the same domain. . . . They represent different ways of configuring and interrogating a wide range of our engagements with the world and each other. . . . [and] neither is adequately addressed without serious attention to the other. (1991: 658)

Rouse relies upon Wartenberg's (1990) account of power as a particular type of ongoing social process which is "continually being reconstituted and/or altered by means of the actions and understandings of social agents" (1990: 164). In addition to being dynamic, power is also situated; the role of "peripheral social others" is crucial in understanding power relationships. One agent has power over another as the result of the social field within which they are both situated.

A relationship between two agents is a power relationship because, and only insofar as, others will normally respond to them by aligning themselves with the dominant agent's actions. Power is thus always mediated by a "social alignment"; through the actions of many peripheral agents, the connection between the dominant agent's actions and the denial or fulfillment of the subordinate agent's wishes is established or enforced. On this view, the social world

becomes an array of overlapping social alignments oriented by ongoing struggles of domination and resistance, within which agents and their actions are situated. (Rouse 1991: 659)

Although Wartenberg restricts the domain of power to this social world, Rouse expands it to elements of the natural world, since power relations require not only keeping other human agents in line, but also depend on a reliable alignment of the physical environment. The construction and extension of scientific laboratories or "microworlds" shape and transform not only the social but the natural world – materials, things, processes, and practices. Thus he contends that power cannot legitimately be withheld from the "natural world" and confined to the "social world."⁵ To illustrate the argument, he shows how "genes" emerge as an object of possible discourse

through accumulations of capabilities and insights in specific contexts (e.g. laboratories with their own projects, protocols and materials, but also experimental systems such as

pisum, drosophila, maize and bacteriophage). These cannot be extended to other locations without complex and subtle mutual adaptations. (Rouse 1991: 660)

Among these are the standardization, simplification, and adaptation of laboratory practices and equipment, and the knowledge they embody. The material and conceptual working environment to which they are extended also requires modification. To take something as knowledge, he suggests, is to project it as a resource for ongoing activity, be this future research or "applications."

Implications for the diversity project

Rouse's account of knowledge and power in science can be put to valuable use in understanding just how much is at stake for Indigenous peoples in the debate over the Diversity Project. The Project's goal is to collect and analyze DNA samples from diverse, predominantly Indigenous, populations and "to develop databases and resources that could be used to investigate new questions in the future" (NSF 1996). The "wealth of information harbored in the DNA of aboriginal peoples" (L. Roberts 1991: 1617) will be transferred to databases that are openly intended to function, in Rouse's terms, as resources for ongoing research activity (although Project organizers specifically deny any intention of developing applications).⁶

The database microworlds, in which this genetic information is to be preserved, will be located regionally as well as centrally. While it is not likely that they will be situated on the actual lands of the Indigenous peoples who will serve as the source of genetic material, they will certainly impact these communities by transforming the relations of power between them and their surrounding nation-states. The laboratory microworlds on which the Project relies are likely to affect Indigenous peoples and lands for two reasons. One is that the Project is actively discouraging a "bleed and run" scenario. Another is that training in genetic research is being offered as an incentive to establish the regional HGDP committees that will do the sampling. Thus, the promise of training in such techniques as growing white blood cells, preparing DNA, and analyzing DNA markers using the polymerase chain reaction is "luring many developing countries to participate in the HGDP" (Kahn 1994: 722). As one molecular biologist in Nairobi notes, "The new biology must find its way into Africa... this is a way of doing it" (Kahn, 1994: 722).

Members of the sampled Indigenous populations are exceedingly unlikely to be members of the regional committees. Anthropologists who have worked among them and who have secured their trust will certainly be. In fact, they already constitute an acknowledged and crucial part of the social alignment that is mediating power in this case, having generated the initial list of the 722 populations deemed "most worthy of genetic study." Indeed, it has been acknowledged that which populations are ultimately sampled will turn on the availability of anthropologists with ties to them. "Isolated and indigenous peoples participate with ethnologists because they trust them," reports one anthropologist and proponent of the Project (John Moore, cited in Gillis 1994: 9).

Many Indigenous peoples have a long history of struggle with and domination by the nation-states in which they are situated, and which will be well represented on these committees. Such committees will decide, among other things, "what scientific questions to emphasize, which populations to approach, and how to adapt the ethics rules to local conditions and cultures" (1994: 9). The Project will significantly impact the social, material, and conceptual environments of Indigenous peoples, sustaining and enhancing the existing unequal relations of power. Indigenous people are acutely aware of this, and of the kinds of tensions and disputes it will exacerbate, or initiate, within their communities.

This transformation of the social and natural worlds is a manifestation of power. The charges of "genetic colonization" that some Project critics have made might best be seen in this light. Rather than the theft and settling of Indigenous lands, the colonization at issue involves their transformation through the wholesale exportation of the microworlds of Western science on to them. Genetic information will be extracted from Indigenous peoples, processed in these microworlds, made available for use and eventual purchase, regardless of whatever measures the Project organizers might take to prevent the latter outcome.

The current social alignments, the current relations of power between dominant Western and subordinated Indigenous cultures, will be reinforced and strengthened by the Diversity Project, as the array of interest groups that constitute and enable Western technoscience (scientists, organizations, institutions, corporations, and governments) respond in ways coherently aligned with the dominant agents' actions. Insofar as the call for the establishment of regional HGDP committees has met with some success, insofar as pilot sampling is currently under way in Europe and China, and insofar as the National Science Foundation has issued – in July of 1996 – a formal call for Project proposals, that reinforcement has begun.

But Indigenist resistance to the Project, and the power relations in which it is embedded, has been massive, vigorous, and effective. Funding support, whether from organizations or government, has been exceedingly slow in coming, and Project organizers have had to wage what amounts to a prolonged public relations campaign in an effort to keep the Project viable and fundable. They have also substantively modified both the rhetoric and the plans of the Project, although I have never seen the Indigenist opposition being credited for this achievement.

WESTERN INTELLECTUAL PROPERTY THEFT

IPRs are a sophisticated name for modern piracy.

(Vandana Shiva)

Law, and most especially intellectual property law, is increasingly central to appreciating the role of power in Western technoscience. It has been, as Alan Hunt (1992: 21) argues, a "primary agency of the advance of new modalities of power and constitutes distinctive features of their mode of operation." Intellectual property laws have been a

particularly effective strategy for acquiring, commodifying, and rendering profitable, intangible Indigenous resources, such as artistic expressions and medicinal and spiritual knowledge. (For more on this, see Whitt 1995.)

Current copyright laws, for example, support and facilitate the practice of cultural imperialism by consigning traditional music to the public domain, then providing for its facile "conversion" to private property. The appropriation by American artistes and record companies of calypso music is a case in point. Millions of dollars have been made from a single song without any of this being returned to the communities of its origin (Wallis and Malm 1984).

Patent law enables a similar practice in the case of genetic resources. The US government is currently funding five major industry/university consortia which have planted their bioprospecting stakes throughout the world. Brazil, for example, earns around \$25 million a year from exporting *Pilocarpus jaborandi*, a medicinal plant used by the Guajajara to treat glaucoma. The corporations who have patents derived from it reap far greater profits. Yet the Guajajara have been subjected to debt peonage and slavery by the agents of the companies involved in the trade. Moreover, *Pilocarpus* populations have been greatly depleted (Posey and Dutfield 1996: 53). The concrete repercussions of divergent construals of knowledge – as commodity and as gift – are painfully apparent here. How the law has served to advance new modalities of power, and to regulate their mode of operation, might be better appreciated by considering the origins and development of intellectual property law. I will do so briefly, focusing on copyright law.

The origins of copyright law

While guilds were instrumental in shaping patent and trademark law, mercantile interests played a major role in shaping the formation of copyright law in England. In particular, publishers sought to obtain monopoly control over the production of books. This control was challenged in the late seventeenth century by writers who needed to earn their livelihood from the sale of their writing.

Although copyright is popularly viewed as a law for authors and artists, it originated with publishers and has long benefited entrepreneurs far more than creators (Patterson and Lindberg 1991). Martha Woodmansee has described how writers transformed themselves into "authors" in the modern sense by redefining the nature of writing. She recounts how, prior to the mid-eighteenth century, writing

was considered a mere vehicle of received ideas which were already in the public domain, and, as such a vehicle, it too, by extension or analogy, was considered part of the public domain. (Woodmansee 1984: 434)

At its best, writing was understood to be a process of inspired craftsmanship, and writers were understood to be a vehicle or instrument, not distinctly and personally responsible for their creations. Understood as craftspersons, writers had to prove themselves adept at following the body of rules that had been preserved and handed down to them for

manipulating traditional materials in order to achieve goals dictated by their audience. Understood as inspired, they were

equally the subject of independent forces, for the more inspired moments of [their] work – that which is novel and most excellent in it – are not any more the writer's doing than are its more routine aspects, but are instead attributable to a higher, external agency – if not to a muse, then to divine dictation. (1984: 427)

The production of poetical works, Goethe notes, was "regarded as something sacred, and it was considered close to simony to accept or bargain for an honorarium" (in Woodmansee 1984: 435).

As Woodmansee argues, this view of the writer changed, and the view of writer as author emerged, as the element of craftsmanship was eliminated or discarded, and that of inspiration was emphasized. Moreover, the source of inspiration was internalized, seen as emanating from within the writer. Literary inspiration came to be regarded as a matter of "original genius," and the inspired work came to be regarded as the peculiar and distinctive product, and property, of the writer.

The struggle between publishers and writers gradually intensified. Publishers attempted to reduce books to their physical foundations: "The book is not an ideal object... it is a fabrication made of paper... a commodity produced for hard cash" (1984: 443). Authors insisted their work transcended their material foundation, yet even so constituted property. It was Fichte who provided the distinction on which subsequent copyright law would largely depend, by describing three distinct shares of property in the book:

When the book is sold ownership of the physical object passes to the buyer... the material aspect, the content of the book, the thoughts it presents also pass to the buyer. To the extent that [the buyer] is able, through intellectual effort, to appropriate them, these ideas cease to be the exclusive property of the author... the form in which these ideas are presented, however, remains the property of the author eternally. (1984: 444–5)

A book thus emerged as "the intellection of a unique individual" (1984: 447). The author, far from being a vehicle of ideas, transformed them, making them the expression of an individual's own unique mind. That original expression is private intellectual property. It, and the right to any profits from it, is what the copyright protects.

In one influential legal definition, "writings" are defined as "any physical rendering of the fruits of creative, intellectual or aesthetic labor" *Goldstein v. California*, 412 US 546, 93 S.Ct. 2303, 37 L.Ed.2d 163 (1973), 304. Copyright law, as we have seen, developed in response to the need for writers to sell their intellectual labor, to turn it into a commodity. As a result of eighteenth-century European writers' challenge to the existing power relations, publishers no longer retained the exclusive right to sell and profit from their writings. In the future, writers would have to surrender their copyright before this could take place.

This inclusion of intellectual laborers in the marketplace required a significant conceptual transformation. Not only did the nature of writing need to be reconceived,

but so did the nature of knowledge. Knowledge, or more exactly ideas, became something that need no longer remain in the public domain. It was able to be transformed into private property, provided that it was "original" and was fixed in some physical form. It could then be exchanged in the marketplace, a commodity to be bought or sold. Interestingly, the originality requirement, at least in US law, has received a minimalist interpretation. A work is original if it is "one man's alone" (*Bleistein v. Donaldson Lithographing Co.* 188 US 239, 1903); any "distinguishable variation" of a prior work is enough to constitute originality, and render it private intellectual property (Baker 1992: 1590).

Innovation and individuality

The chasm between "inspired" writing and "original" authorship is deep. As we have seen, the writer as a vehicle or instrument was regarded as subject to independent forces that played a crucial role in the writing process. The inspired moments of a work, no less than its more routine moments, were not the writer's sole doing. With the shift to the notion of original authorship, inspiration was internalized and the writer was relieved of responsibility to traditions preserved and passed down. Such intellectual labor sprang from the "original genius" of an individual, and hence was that individual's personal product and property.

The criterion of originality in copyright law to which this led has its counterpart in the requirement of novelty in patent law. The result was the embedding within Western intellectual property law of assumptions about individuality and innovativeness that are acutely at odds with the conceptual commitments of many Indigenous cultures. This has directly enabled the continued expropriation of Indigenous cultural and genetic resources. As Aroha Mead (1995) comments,

I query the concept of "innovation" as defined by Western intellectual property laws – particularly when no recognition or value is accorded to the customary knowledge which links a species of plant to a particular usage, and details the most appropriate harvest, portion of the plant . . . and method of preparation.

Indigenous knowledge and generations of Indigenous labor – mental and physical – are discredited. All that is credited is the "chop-shop" labor of individual corporate and academic scientists who interject "novelty" into what they have taken.

Western concepts of "originality" and "novelty" are thus imposed on the world through coercive instruments such as the TRIPS provisions of the GATT.⁷ The US government, for example, has been pressuring Ecuador to ratify a Bilateral Agreement on intellectual property rights, based on the same principles as those of the TRIPS. It opens the door to broader patents, despite the fact that the Andean Pact Law on Patents forbids any patents on human genes or organs. It does this, moreover, in the face of efforts "to implement legislation on Intellectual Collective Rights to protect traditional knowledge against monolithic appropriation" (Secretariat 1997).

Across the planet, at an accelerating pace, collectively owned traditional medicines and seeds are being privatized and commodified. Altered sufficiently to render them patentable, they are transformed into the "inventions" of individual scientists and corporations, and placed on sale in the genetic marketplace. This is the history and context which informs Indigenist resistance to the Diversity Project. Whatever the "good intentions" of the individual scientists involved, (see Moore 1996), it is only the latest (if most disturbing) manifestation of biocolonialism as a conjuncture of Western law and technoscience.

Biocolonialism threatens to assimilate the knowledge, resources, and labor of generations of Indigenous peoples. To play the dominant society's game, and adopt intellectual property protection in order to thwart biopiracy, is ultimately to be transformed by that society's values and practices: "we cannot buy the arguments that we have to play within the field of existing patent and copyright laws to be able to protect our resources and knowledge," Tauli-Corpus (1993: 26) insists. Yet the other horn of this dilemma is that "without control over their intellectual products, their knowledge stands to be expropriated without any material benefits reaching them" (Agrawal 1995b: 4).

Meanwhile, Indigenous knowledge systems are dismissed as closed, changeless, stultifying, and stifling of originality. Such characterizations not only ignore the massive contributions of Indigenous peoples – especially medicinal, pharmaceutical, botanical, and agricultural – they also egregiously distort Indigenous knowledge systems themselves. If these systems did not foster agricultural innovation or plant-breeding "originality" (to cite but one instance), the rich diversity of the gene-plasm currently held in seed banks and field gene banks would be wholly inexplicable.

Within most Indigenous knowledge systems, the source of originality is not internalized, as the genius of one individual. Rather, the natural world, the community, and the individual are all integrally involved. Individuals are subject to independent forces, and constrained by the need to act with respect for the natural world and for future generations. The community grounds and informs the individual. However, since the process of knowing is experientially based, and what one learns depends on individual development, abilities, and preparation, individuals play an essential role in contributing new knowledge to the community. As one young Keres man explains: "Yqu don't ask questions when you grow up. You watch and listen and wait, and the answer will come to you. It's yours then, not like learning in school" (Larry Bird, in Tafoya 1982: 24).⁸

Such an approach to innovation requires receptivity, reciprocity, and responsibility to the natural and human worlds in which one is situated. And it is the result of conducting oneself in, and of relating to, the natural and human worlds in accordance with that normative constraint. This relation is evident in the Andean practice of conversing with the natural world which is central to their agricultural science. Such dialogue leads one "to emphasize and attune oneself with [the other's] mode of being, and in company with that other, to generate and regenerate life" (Grimaldo Rengifo, in Appfel-Marglin and Rivera 1995: 13).⁹ It is manifested in their effort to increase the diversity of their cultivated plants by "testing" new varieties. The cultivator does this

without obligating the new seed "to get accustomed by force". It is accepted for a seed that does not "accustom" itself to move away... the [cultivator] says simply: "this seed does not get used to me..." and continues "testing" others "to see if they follow him or her." (Apffel-Marglin and Rivera 1995: 33)

The new knowledge that results from such conversing is a gift. To paraphrase an earlier comment: when gifts are given, the continuity of social relationships (and, we should add, of relationships with the natural world) has the effect that the gift given always remains the givers'. It is inalienable.

CONCLUSION

There has recently been a surge of interest by the dominant culture in Indigenous knowledge and Indigenous knowledge systems. The reasons are multiple. They include the failure of development policies that have disregarded the social, political, and cultural contexts in which they were implemented, and an as yet limited appreciation of the value and viability of Indigenous knowledge systems. The rhetoric of development, one commentator observes,

has gone through several stages. . . . Today indigenous knowledge is seen as pivotal, above all, in discussion on sustainable resource use and balanced development. This orientation is in stark contrast to the views of many earlier theorists, who saw traditional knowledge and institutions as obstacles to development. (Agrawal 1995a: 3)

The study of Indigenous knowledge has even been institutionalized, with the establishment of a Center for Indigenous Knowledge in Agriculture at Iowa State University, an Internet list on Indigenous knowledge and a journal, the *Indigenous Knowledge and Development Monitor*. Such developments are consistent with the knowledge-as-commodity metaphor. The commodification of Indigenous spiritual knowledge has become the speciality of the New Age industry, the commodification of traditional medicinal knowledge has become the speciality of the pharmaceutical industry, and the commodification of plant genetic resources and Indigenous agricultural knowledge has become the speciality of the commercial seed industry. In opposing the Diversity Project, what Indigenous peoples are now resisting is part of that continuum, the commodification of the genetic information in their cell-lines.

After a period of dormancy, there has also been within academe a renewed interest in contrasting Indigenous and non-Indigenous knowledge, with attendant debate about terminology and the implications of adopting one terminological distinction rather than another. This debate has tended to proceed, as one might expect, on methodological and epistemological grounds. It often aims to secure some sort of dialogue between, if not integration of, Indigenous and Western knowledges of the natural world. A recent editorial in the *Indigenous Knowledge and Development Monitor*, for instance, calls for the development of "methodologies designed to build a bridge between various knowledge

systems" (IKDM 1996a: 1). Hand-in-hand with this are calls for the gathering, documentation, archiving, and preservation of Indigenous knowledge in national and international databases, presumably because no bridge can be built when there is nothing left to bridge.

For a long time, the existence of Indigenous knowledge and knowledge systems was denied. When their existence was acknowledged, they were generally deprived of cognitive standing. They were dismissed as primitive, mystical, and unscientific – since they violated the fundamental methodological canons and commitment to value-neutrality of Western science. And steadily, steadily throughout, political, economic, and cultural practices and policies of oppression have been eroding away their very substance, their conditions of existence.

The solution now is not the isolation, documentation, and storage of Indigenous knowledge in international, national, and regional archives. No more than is the preservation of Indigenous cell-lines in databanks the proper response to the "vanishing," "rapidly disappearing" "isolates [who are] of Historic Interest" to population geneticists. Nor is the answer a "bridge" to assimilation built in the context of unequal power relations, and with the bridging interests of the dominant culture setting the agenda: a proposal that promises to be simply another stage in the politics of disappearance.

The appropriate response from those interested in preserving genetic diversity has already been formulated by Indigenous critics of the Human Genome Diversity Project:

Why don't they address the causes of our being endangered instead of spending \$20 million for five years to collect and store us in cold laboratories? If this money will be used instead to provide us with the basic social services and promote our rights as indigenous peoples, then our biodiversity will be protected. (Tauli-Corpus 1993: 25-6)

And the appropriate response from those interested in preserving the diversity of knowledge systems has been proposed by Arun Agrawal. That response, he suggests, lies

in attempting to reorient and reverse state policies to permit members of threatened populations to determine their own future, thus facilitating *in situ* preservation of indigenous knowledge. *In situ* preservation cannot succeed unless indigenous populations and local communities gain control over the use of the lands on which they dwell and the resources on which they rely. Those who are seen to possess knowledge must also possess the right to decide on how to conserve their knowledge, and how and by whom it will be used. (Agrawal 1995a: 5)

It is, after all, the givers of gifts who must determine when, to whom, and how the gifts are to be given.

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NOTES

- 1 Indigenism critiques the diverse power relations and dynamics that facilitate and maintain the oppression of Indigenous peoples. It stresses the existence, effectiveness, and potential of Indigenous agency in resisting oppression and in formulating concrete proposals for securing justice.
- 2 For examples, see the Summer 1996 special issue of *Cultural Survival Quarterly*, which was devoted to this topic.
- 3 This comment was made at a 1997 conference on "Women and Genetics in Contemporary Society" by a geneticist working with one of the Diversity Project's main proponents.
- 4 Nor do I wish to assume the adequacy of the gift/commodity distinction as a way of contrasting entire economic systems. For further consideration of this, see Appadurai (1986).
- 5 It is worth noting, parenthetically, that this approach has some limited analogy to the Indigenous conception of power, in which the natural world is also vitally implicated.
- 6 Surprisingly, given historical precedent and the economic and political realities of securing funding for such research, they also question its likelihood: "Although very unlikely, it is nevertheless possible that the results of the HGD Project" will lead to commercial applications (HGDP 1993). A draft "Materials Transfer and Database Access Agreement" has been drawn up.
- 7 GATT (General Agreement on Tariffs and Trade) and TRIPS (Trade-related Intellectual Property) are the United Nations' primary trade negotiation institutions.
- 8 The other side of this is nicely captured by Thomas Buckley: "To explain too much is to steal that person's opportunity to learn" (in Dooling and Jordan-Smith 1989: 39).
- 9 Rengifo is the coordinator of PRATEC, an NGO formed in 1987 which researches Andean science, technology, and philosophy. This remarkable group has developed an accredited university course which critiques the contemporary Western knowledge system from an Andean perspective. For more on this project see Appfel-Marglin and Rivera (1995).

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