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Living Rubber, Dead Land, and Persisting Systems in Borneo: Indigenous Representation of Sustainability

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**Figure 1. Borneo**

MICHAEL R. DOVE

# Living Rubber, Dead Land, and Persisting Systems in Borneo

## Indigenous Representations of Sustainability

It is encouraging surely to find a large commercial smallholder crop [rubber] that is environmentally tolerable. ... An appreciation of why people in society do these things for reasons other than environmentalism ... is called for. (Gordon 1993:152.)

### I. Introduction

This analysis is a contribution to current critical studies of global environmentalism. Contemporary environmental discourse is dominated by binarily opposed values of Western origin, such as conservation versus degradation and afforestation versus deforestation. The purpose of the present analysis is to denaturalize these concepts by trying to get at alternative, non-Western, indigenous concepts of environmental representation. The existence of such concepts has the potential to challenge the hegemony of modern Western discourse on the environment.<sup>1</sup>

#### 1. The Problem

Kantu' tribesmen in West Borneo (Figure 1) say that when they plant rubber (*Hevea brasiliensis*) in their swiddens or swidden fallows, the land thenceforth becomes *tanah mati* (dead land), in implicit contrast to the

<sup>1</sup> See Ingold (1993:42):

'My sense of the contemporary discourse on the environment in the West is that it continues to be dominated by global imagery associated with the triumph of modern science and technology, but that it is under increasing threat from those – including many anthropologists – who would turn to local or indigenous cosmologies of engagement for sources of insight into our current predicament.'

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remaining 'living land' contained in the swidden agricultural cycle.<sup>2</sup> This indigenous characterization of the consequences of rubber cultivation as 'killing' is puzzling, because it conflicts with what otherwise appears to be the impact of rubber cultivation. From an indigenous perspective, rubber is seen as an economic boon that ably mediates between subsistence priorities and market needs; from the perspective of social scientists and ecologists, it is regarded as one of the best adaptations to the Southeast Asian rain forests yet devised (Dove 1993; Gouyon, de Foresta, and Levang 1993); and from the perspective of Western environmentalists, it is viewed as a silvicultural system that is so admirable that it is touted as not merely a complement to but even a replacement for swidden agriculture, with its wood becoming one of the first 'eco-labelled' tropical timbers (Gordon 1993).<sup>3</sup>

It will be suggested here that the Kantu' characterization of rubber lands as 'dead' has to do with a pervasive ideology of exchange involving both society and environment. Rubber is not part of this system and, accordingly, it 'kills' exchange and thus the land. 'Exchange' cannot, however, be equated with 'sustainability', nor can we conclude that rubber cultivation is 'destructive' – for in many respects it is just the opposite of this. An exegesis of Kantu' beliefs about rubber and dead land will reveal the inadequacy of existing Western concepts for discussing sustainable environmental relations cross-culturally. This analysis will contribute to the critique of 'primitive environmentalism' and enhance our understanding of indigenous representations of environmental relations and conceptions of nature and culture. More generally, this analysis will contribute to the attempt in contemporary ethnography to grapple with what Obeyesekere (1992:175) called (in his critique of the ethnographic belief that Western explorers were viewed by the indigenous peoples of the Pacific as 'gods') 'this problem of literalizing tropes'. The analysis here shows that, whereas it is correct to translate land planted in rubber (*tanah mati*) as 'dead land', the meaning of this 'deadness' must be interpreted within a 'context of utterance' (Obeyesekere 1992:175) that encompasses not just agricultural economy and ecology but also society and cosmology, as well as the history of land-use change and relations with global trade systems.

<sup>2</sup> Whereas the Kantu' use the term *tanah mati* (dead land) for rubber gardens, they do not use the term *tanah idup* (living land) for swidden land. In this opposition, swidden land is the privileged register: rubber land needs to be differentiated from swidden land, but not the reverse.

<sup>3</sup> Gordon (1993:138) notes, however, that many of the Western ecologists whom one would expect to be familiar with the success of smallholder rubber cultivation in Southeast Asia are not:

'Given the facts concerning the extent of smallholder cultivation, it is indeed surprising to find in the work of a prominent ecologist such as Myers a belief that estates (or plantations) predominate and that their industrial practices are ecologically sound [...] Myers is, in effect, throwing his case away.'

Gordon is apparently referring to Myers 1992:239.

## 2. Indigenous Versus Western Environmental Representation

The Kantu' belief that land under planted rubber trees is 'dead' and (implicitly) that land in the swidden cycle is alive is a good example of indigenous environmental representation. Whereas Western environmental concern until recently focused on the state of discrete environmental elements, like forest cover, this Kantu' belief emphasizes the nature of the *relationship* between society and environment. Whereas Western concern has focused on questions of sustainability, the Kantu' belief focuses on cycles of living and dead land, of creation and destruction. Williams (1980:78) suggests that Western views of nature deny the history of human labour: for the Kantu', this history – which differentiates not just between labour and its absence, but also between different types of labour, such as the planting of annuals versus perennials – is clearly important. Whereas Western environmentalists idealize concepts of primitive harmony with the environment, Kantu' beliefs emphasize the reality of dynamic, fluctuating relations between society and environment. In this sense, Kantu' beliefs resemble post-Odum Western beliefs<sup>4</sup>: disturbance is not seen as something outside history, rather disturbance *is* history (Worster 1995:74).

Kantu' conceptions of rubber and the environment have important implications for the dichotomy between nature and culture that still dominates Western environmentalist discourse. This dichotomy is manifested in such common environmentalist images and phrases as (1) the 'blue planet' and 'spaceship earth' (Ingold 1993; Sachs 1994); (2) the concept of a 'subsidy' or 'surplus' from nature (Alcorn 1993; Blaikie 1985:124; Hecht, Anderson, and May 1988); (3) the concept of agriculture 'mimicking nature' (Beckerman 1983; Vickers 1983); (4) the concept of 'intervening' in nature (Ingold 1993; Williams 1980:75); and even (5) the concept of 'primitive environmentalism' (Ellen 1986).<sup>5</sup> All of these concepts depend for their very articulation on a distinction between subject and object, between society and environment, which is not given but constructed.<sup>6</sup> The artificiality of this construction is one of the central tenets of the deep ecology movement, whose scholars have been in the forefront of contemporary efforts to deconstruct the objectification of nature, to argue against any 'ontological divide in the field of existence' (W. Fox 1984:196). There is no such objectification in the Kantu' beliefs that will be discussed in this paper: the Kantu' concept of 'dead land' under rubber is based not on the separation but on the unity of culture and nature. The Kantu' beliefs to be analysed here

<sup>4</sup> This refers to the 'modern' scientific emphasis on natural order (as opposed to natural chaos), which was epitomized by the writings of Eugene Odum (1971; cf. Worster 1995).

<sup>5</sup> The nature-culture dichotomy is even manifested in the mundane division of 'town and country' (Cronon 1991:8).

<sup>6</sup> Ingold (1993:40) writes, 'The local is not a more limited or narrowly focused apprehension than the global, it is one that rests on an altogether different *mode* of apprehension – one based on an active, perceptual engagement with components of the dwelt-in world, in the practical business of life, rather than on the detached, disinterested observation of a world apart'.

will illustrate not how the dichotomy between nature and culture is deconstructed, but rather how it is not constructed in the first place.

### 3. Background: The Kantu' and Kantu' Rubber Cultivation

The bulk of rubber in Borneo is produced in tiny gardens of a hectare or so, by 'smallholders' like the Kantu' (Dove 1993; Gouyon, de Foresta, and Levang 1993).<sup>7</sup> The product of their cultivation – the pressed but usually uncured rubber slabs – is traded or sold to Dayak, Malay, or Chinese traders in the interior, who in turn sell it to traders on the coast. Most smallholders have (and have had for centuries) 'composite economies': they cultivate food crops – usually by extensive swidden agricultural technology – to meet their subsistence needs, while gathering or cultivating export commodities like rubber to meet their market-oriented needs.<sup>8</sup> In the case of the Kantu', an Ibanic-speaking Dayak people, the primary subsistence crops are dry rice (as well as some swamp rice) and a wide variety of non-rice cultigens, including a second cereal, maize, a number of different cucurbits, and a number of different tubers, including cassava and sweet potato and, to a lesser extent, taro. Rice is the primary starch staple and the focus of each meal, supplemented with one or more of the non-rice cultigens as a 'relish'. When the rice crop fails to meet subsistence requirements (as it may several years in ten), the market crops are sold to buy rice (and if that fails, then cassava and other tubers become the starch staple for the duration of the famine period). Para rubber (*Hevea brasiliensis* [Willd. ex Adr. de Juss.] Muell.-Arg.) is the most important market or cash crop for the Kantu', with pepper (*Piper nigrum* L.) being a distant second.

Rubber, a native of the Amazon basin, was first planted in the interior, tribal regions of Borneo towards the end of the first decade of this century. It was adopted with remarkable speed by local communities throughout this region (not only in Borneo, but also in Sumatra and in peninsular Malaysia). Whereas it was initially propagated as an estate crop in the former Dutch and British colonies, within two decades of its introduction it had become predominantly a smallholder crop. In Indonesia today, over 1 million smallholder households hold 2.6 million hectares of rubber and are responsible for three fourths of the country's total production (CPIS 1993:3; Government of Indonesia 1994:233-4).<sup>9</sup> This success is all the more notable because it occurred among marginal peoples who have been

<sup>7</sup> Smallholders also produce most of Indonesia's coconuts, coffee, cocoa, pepper, cloves, tobacco, and a number of other cash crops (Government of Indonesia 1994:233-4).

<sup>8</sup> This combination of market- and subsistence-oriented agricultural activities is quite common in Indonesia (and indeed among forest dwellers throughout the tropics). Other examples are swidden agriculture and rattan gathering/cultivation in East Kalimantan (Lindblad 1988:59-60; Peluso 1983; Tsing 1984; Weinstock 1983), swidden agriculture, coffee, and dammar in Sumatra (Mary and Michon 1987), and sago palm and spices in the Moluccas (Ellen 1979).

<sup>9</sup> Other smallholder efforts, as with coconuts (Heersink 1994:51-2), similarly flourished where European estate-based efforts failed.

labelled as resistant to innovation and development by both colonial and post-colonial governments, and because these governments did nothing to support this adoption and a great deal to hinder it (Dove 1996).

There are two principal reasons for the success of rubber in the face of these obstacles. The first involves the serendipitous fit of rubber into a changing indigenous tradition of gathering natural forest rubbers. During the second half of the nineteenth century, booming international markets brought the influences of new players and more intensive systems of exploitation to bear on these rubbers; at the same time, the gradual evolution of the tribal rubber gatherers towards more sedentary settlement patterns and more intensive agriculture was transforming the niche into which the forest rubbers had formerly fitted. The exotic *Hevea* suited the transformed niche better than the native forest rubbers, and (as an introduced and thus 'domesticated' species) it was protected against some of the pressures being applied by opportunistic outsiders to the 'wild' forest rubbers. The second reason for rubber's success involves the way it complements the indigenous system of swidden agriculture. The comparative agronomies of rubber and swidden rice permit them to be jointly cultivated with little competition for either land or labour. The advantage of this joint cultivation is that it significantly reduces the measure of agricultural risk borne by the small farmer: rubber tapping helps the smallholder to survive periodic swidden failures due to environmental variables, and swidden cultivation helps the smallholder to survive periodic collapses in rubber prices due to market variables.<sup>10</sup>

Despite this historical and economic 'fit', swidden land planted in rubber is said by the Kantu' to be 'dead'. Rubber appears to be the first (and so far the last) cultigen to have this effect. No swidden crop, nor any aspect of the swidden cycle, is ever said to 'kill' the land, not even when primary forest is opened. In order to understand why the land is 'dead' under rubber, it is first necessary to understand how the land otherwise is 'alive'. I will begin with a brief description of the Kantu' and their system of rubber cultivation. I will then discuss the general importance of principles of exchange and reciprocity among the Kantu' and similar societies; and after that I will show how these principles do *not* apply to rubber cultivation. In the next section, I will discuss the ubiquity of human-tree metaphors, current theoretical interpretations, and their inadequacy

<sup>10</sup> In contrast, Pelzer (1945:24) describes for Sumatra a very different pattern of rubber adoption, which was based not on combining market-oriented rubber and subsistence-oriented rice, but rather on a complete and one-way shift from the latter to the former: 'A shifting cultivator, may, over a period of years, convert his old ladangs into rubber gardens, for example, until he is assured of a sufficient income from his permanent tree crop to buy his food from the outside and no longer requires a ladang for the production of food'. This pattern of agricultural transformation is not found in Borneo among Dayak like the Kantu', but is found among Malays (Islamicized Dayak), for whom indeed it can be an identity marker. (I am indebted for this observation to an anonymous reviewer of *Bijdragen tot de Taal-, Land- en Volkenkunde*.)

in explaining Kantu' characterizations of rubber. In the concluding section, I will discuss the implications of this analysis for current debates about indigenous representation of the environment.

## II. Social and Ecological Exchange

The 'life' of the land, among the Kantu' and many other societies that adopted rubber at the beginning of this century, pertains to the role of land in pervasive relations of exchange in which not only land but also people participate. The most fundamental principle underpinning these relations is that of reciprocity (which has implications for the cost of resource wealth and for views of distribution versus accumulation and permanence versus impermanence).

### 1. Bounty Bears a Cost

The operation of the principle of reciprocity can be seen, first, in the Kantu' belief that wealth or bounty bears a cost. This is aptly illustrated by tribal beliefs concerning the 'mast fruiting' of the trees in Borneo's rain forest. Every three to five years, many of the rain-forest dipterocarps bear a heavy crop of fruit.<sup>11</sup> Borneo's tribesmen welcome mast fruitings as an opportunity to increase personal consumption of, and trade in, the forest fruits. But they also believe that the increased consumption of the 'mast' year entails a cost<sup>12</sup>: thus, the Kantu' say that the spirits of the forest demand *sigi' kolak mata mensia* (one basket, of about 5.9 litres<sup>13</sup>, of human eyes<sup>14</sup>) during a mast-fruiting year (that is to say, the spirits demand human dead in sufficient numbers to fill a basket with their eyes).<sup>15</sup> A corollary to this principle that bounty bears a cost is the reverse principle that cost yields a bounty: the most important statement that most animist tribesmen of Borneo can make to their gods involves the sacrifice of one or

<sup>11</sup> The evolutionary purpose of the mast fruiting is to overload seed predators during the mast years and thereby enhance the prospects for seed survival, while denying predators food during the intervening years and thereby suppressing their population growth. Mast fruiting in Borneo is triggered by dry air masses, caused on the western side of the island by 'a chance fluctuation in the subtropical monsoonal circulation system' and on the eastern side by the El Niño-Southern Oscillation phenomenon (Ashton, Givinish, and Appanah 1988:61).

<sup>12</sup> Ambivalence regarding bounty is widespread. See Sugishima (1994:159) on the Lionese of central Flores: 'Witches are also feared as the providers of "extraordinarily large harvests" (*kesu*), since their souls (*ana wera*) are contained in these. Those who eat of such crops will become incurably ill and die.'

<sup>13</sup> The *kolak* (basket) that is mentioned here is a regional unit of standard measure (of volume) (Wilkinson 1959:607, 621), which among the Kantu' averages 5.9 litres. (Since the human eye has an average volume of 6.37 cubic centimetres (personal communication, J. Scott Kortvelesy, M.D.), one *kolak* could hold approximately 157 eyes (or the eyes of 78.5 persons).)

<sup>14</sup> This is not an uncommon belief: the Dogon of Mali, for example, fear that spirits of the bush 'will exchange eyes with humans, rendering them blind' (Van Beek and Banga 1992:67).

<sup>15</sup> An alternative version of this belief is that the spirits only demand a 'basketful of human eyes' when the mast occurs two years in a row. The principle is the same in either case, however: unusual bounty is thought to bear a cost that is commensurate with its benefit.

more domestic pigs. Such a sacrifice entails a significant economic cost to the tribesmen, but it is one they justify by saying that any family that makes this sacrifice is certain to reap better harvests as a result, or at least better harvests than those families that do *not* make the sacrifice.<sup>16</sup>

The converse of the spirits giving the Dayak a mast fruiting in exchange for a human sacrifice is their withholding the mast fruiting because, in effect, such a sacrifice has not been made. The Kantu' say that their relations with the spirits are governed by a number of proscriptions as well as prescriptions, and prominent among the former are sexual proscriptions (against adultery, illegitimate birth, and incestuous unions). The Kantu' say that when they honour these sexual proscriptions, the spirits will assist them in enjoying the fruits of the land and forest, and when they don't they won't.<sup>17</sup> Thus, the Kantu' say that because of repeated violation of these sexual proscriptions, mast fruitings are less frequent today than formerly, and when they do occur they are less abundant than formerly. The only way to avoid this withdrawal of the spirits' favour, in the event of a sexual offence, is to make a compensatory offering or sacrifice to the spirits. Formerly, the lives of the offending couple themselves (namely those who committed the sexual offence) were sacrificed to the spirits.<sup>18</sup> In modern times, domestic pigs are sacrificed instead. For a serious sexual offence, seven pigs should be sacrificed: one each at the oldest *rian* (durian, *Durio zibethinus* Murr.), *engkabang* (candlenut, *Shorea*, section *Pachycarpae*), *tapang* (a bee tree, often *Koompassia excelsa* [Becc.] Taub.)<sup>19</sup>, and *buah* (any other forest fruit) in the territory, and one each in the *rumah* (longhouse), on the *tanah* (ground), and at the *sungai* (river).<sup>20</sup>

<sup>16</sup> On the economic fortune of one household relative to another, see Jane Schneider (1990:27-8):

'At stake is the "very general need" that "the fortunate" is seldom satisfied with the fact of being fortunate [but] needs to know that he has a *right* to his good fortune. He wants to be convinced that he "deserves" it, and above all that he deserves it in comparison with others [...] Good fortune [...] wants to be "legitimate" (Weber 1958:271). Bound by this ethic, the members of small communities anticipate spiritual danger from "overstepping" their legitimate bounds [...].'

<sup>17</sup> Similar notions of the morality of exchange are common throughout Southeast Asia. An unusually explicit example is provided by Jorgenson (1989), who writes that the Pwo of Thailand periodically thank the forest for the bounty that it provides them by turning over to the forest (and forest animals) an entire swidden, complete with standing crops. Jane Schneider (1990) suggests that this sort of 'equity consciousness' with nature spirits was common in the Western world as well before the advent of capitalist relations of production.

<sup>18</sup> It is said today that the offending couple would have been buried in the ground with a bamboo stake driven through them, the subsequent growth of this stake being intended to serve as a warning sign to future would-be transgressors. The underlying principle of reciprocity here can be seen in many societies around the world. For example, Clay (1991:266) writes that the Tukano of Brazil 'believe that if fish are taken from restricted areas, the ancestors of the fish will take infant children – one child for one fish'.

<sup>19</sup> See Burkill (1966, II:1305-6) and Richards (1981:369).

<sup>20</sup> One basic axis of differentiation in conceptions of nature-culture relations is that of symmetrical versus asymmetrical. Bird-David (1990), for example, differentiates between the

The second, and related, dimension of the principle of reciprocity in Kantu' society is that too much bounty can be a bad thing. That is, there is a point at which the accumulation of material wealth (whether due to the direct efforts of humans or the bounty of nature) violates indigenous norms for redistribution and reciprocity and, indeed, is made possible only by such violation. Thus, the majority of swidden rice surpluses are typically distributed each year, from households enjoying surpluses to households experiencing shortfalls. As a result, any long-term accumulation of rice stores by a given household is suspect, since it implies that requests for rice to tide others over harvest shortfalls have been refused.<sup>21</sup> The assumed immoral origins of such accumulation are reflected in explanations of the perceived material wealth of the Roman Catholic church in Borneo: thus, the Kantu' say that the loft of the Catholic mission nearest to their territory is inhabited by a *naga* (dragon), which excretes gold coins when it is fed human dead. The implication, therefore, is that only such a gross violation of the moral order as feeding one's dead to a dragon could produce the kind of accumulated wealth that they associate with the Roman Catholic church. (The belief that material accumulation, as opposed to distribution, is the work of the devil, is familiar from works such as that of Taussig (1980) on Peruvian mining.)

## 2. Creation and Destruction of Bounty

Over-accumulation of bounty can be avoided by its distribution or destruction. As the story of the Catholic dragon suggests, there is a linkage between destruction (that is, death) and creation (that is, of wealth). This linkage, and the principle of cycling and recycling that underlies it, is central to the cosmology of many Dayak groups (and, indeed, to the cosmologies of indigenous peoples throughout Southeast Asia).<sup>22</sup> An example

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conception of a 'reciprocating' (that is, symmetrical) relationship that is maintained by many tropical forest cultivators (as in the Kantu' case) and a 'giving' (that is, asymmetrical) relationship that is maintained by many tropical forest hunter-gatherers (and mixed cultivators/hunter-gatherers). Another major axis of differentiation, in the case of asymmetrical relationships, is the mode of justification of this asymmetry. Gudeman (1986:108-9) writes that among the Bemba and Bisa of Zambia, this asymmetry is interpreted as a reservoir of good intentions on the part of one's ancestors (which one can draw on so long as good relations are maintained with the ancestors); and he contrasts this with the view taken by the Physiocrats (economists and social theorists) of mid-eighteenth-century France, who interpreted this asymmetry (the net product or surplus of resource exploitation) in terms of 'nature's position as a pool to be drawn upon'.

<sup>21</sup> Rice stored for more than a few years goes bad and becomes unfit to eat, which makes its accumulation all the more immoral. Thus, to say that a household has such large and long-standing rice stores that the rice has gone bad is the ultimate Kantu' expression for both farming success and social failure.

<sup>22</sup> There is, for example, an apposite complex of Indo-Malay myths regarding the rice goddess Dewi Sri, in which the after-world is associated with life, the death of the goddess is associated with the birth of rice, mortuary shelters are associated with rice barns, and so on (Stutterheim 1956; Carpenter 1989).

is a myth of the Ngaju, a people of south-central Borneo, concerning the 'Tree of Life' (a central symbol of their cosmology): 'When the Tree of Life bears its fruit [...] it does not simply stand in solitary height, for then its time has come. The birds fly to it. They peck at the fruit of the Tree, they destroy it, and from the destruction and self-destruction arises the whole cosmos.' (Schärer 1963:128.)

The image of epochal fruiting in this myth resembles the phenomenon of mast fruiting discussed earlier. The stochastic character of production underlying both mast fruiting and Ngaju cosmology has an ecological basis: mast fruiting is an adaptation to the generally impoverished environment of the tropical forest, and the more extreme the impoverishment in particular cases, the more extreme the mast (that is, the less frequent but the greater in magnitude the mast (Van Schaik, Terborgh, and Wright 1993:358)). There is increasing evidence that patterns of perturbation of this sort, stochastic or catastrophic rather than gradual change, characterize forest history and, indeed, the natural history of the earth's environment in general (Berggren and Van Couvering 1984; Brookfield and Overton 1988; Gould and Eldredge 1977). There is increasing evidence, that is, that periodic 'disturbance' in forests and other natural ecosystems is both predictable and essential to the sustainability of systems. The linkage of creation and destruction also has a basis in the everyday processes of rapid decay (as opposed to accumulation) and then re-use of organic matter (the 'fast cycle') that characterizes the tropical forest.<sup>23</sup>

Creation and destruction are linked in a cycle, and anything that interrupts or resists this cycle is seen as a violation of the cosmological order. This is reflected in the traditional Kantu' *pantang* (proscription) against the use of Borneo's foremost timber, from the ironwood tree (*Eusideroxylon zwageri*), in house construction.<sup>24</sup> The Kantu' rationale for this proscription is that the durability of this wood and anything constructed from it surpasses the life-span of the people using it. In light of the current analysis, we might also suggest that the problem with such long-lived construction is that it represents a bounty taken *from* nature with no human foreknowledge of when it will return *to* nature. The cycle of

<sup>23</sup> Davison and Sutlive (1991:203) come to the same conclusion regarding the role of tropical forest ecology in indigenous systems of meaning when they suggest that 'the ritual significance of Iban headhunting, as a cultural institution, is built upon an organic metaphor of frugivorous [that is, vegetative] reproduction, rather than one of phallic procreation'. They write, 'Ultimately, it is the Bornean rain forest, with its endless cycle of vegetative growth, decay and regeneration, which underpins the Iban cult of headhunting and sustains its ritual significance as an agency of fertility' (Davison and Sutlive 1991:213).

<sup>24</sup> This proscription applied specifically to the use of ironwood for *tiang* (longhouse poles), *atap* (roof shingles), *tangga'* (longhouse ladder/stairs), and *perau* (canoe). The Kantu' sub-group (the Melaban Kantu') with whom I worked still honoured this proscription in its entirety in the 1890s. By the 1930s, they were honouring it for the longhouse pillars but not for the roof shingles, for which they had started using ironwood. By the 1950s, they were using ironwood for all parts of the longhouse.

destruction and creation, the cycling between nature and culture, is broken by such construction.<sup>25</sup>

Another example of such beliefs is reported for the Merina of central Madagascar: Bloch (1989:179-80) describes a proscription among the Merina against planting trees whose life-span surpasses that of humans: he interprets this proscription in light of tension in Merina society between the (transitory) life of the individual and the (eternal) life of the undifferentiated descent group. The former, which Bloch glosses as 'individuation', opposes the latter, because it terminates with death. The problem posed by individuation is reflected in the prescription that all individual property must be distributed before death. The problem with planting long-lived trees is that they interfere with this cyclic relationship between the individual and the descent group. As Bloch says (1989:179), such planting 'would therefore compete with descent in an absolute way. It would render something of the individual permanent [...]' Bloch's explanation is evocative of the principles elucidated here concerning the need to distribute versus accumulate wealth and the need to destroy in order to create. Long-lived trees present a challenge to the moral order (and the moral cycle) not because something has been destroyed forever but, counter-intuitively, because something has been *created* forever.<sup>26</sup> Permanent life presents as much of a problem to this moral ecology as permanent death.<sup>27</sup>

Permanent non-life is something else, however. Some things are *not* supposed to change or cycle. The Simpang Dayak of southwest Borneo sum

<sup>25</sup> See Van Beek and Banga's (1992:69) analysis of the dichotomy between the fixed village and the 'moving' bush among the Dogon of Mali:

'Anything in the bush moves and changes, in any season – sand dunes, gullies, trees and rocks. Only the village stays put as the only fixed point in the Dogon ethnogeography, inhabited by a series of succeeding populations (Toloy, Tellem, Dogon). They are the areas of stability. However, they also represent stagnation, the places where the forces of the bush wither away: life and death, wisdom and knowledge coming from the bush are applied in the village, but used up and worn down in the process.'

<sup>26</sup> The threat to the moral order in the case of the Merina appears to be based, in part, on the fact that the ever-enduring trees are individually owned. When trees are owned not by individuals (or individual households) but by larger groups, their value within this morality of exchange may be reversed. Sather (1990:20) writes of an Ibanic group in Sarawak:

'Thus, tree rights transcend the basic units of everyday social life – the household and longhouse – and in doing so, reflect a sense of deeper historical connection, linking individuals and families through ties of ascent to past generations of household members, regional pioneers and longhouse and household founders, thus reinforcing their membership in a wider regional society encompassing the whole of the upper and middle Paku.'

<sup>27</sup> The phrase 'moral ecology' is based, in part, on James C. Scott's (1976) concept of 'moral economy'. According to Scott's work, the moral economy is one that guarantees basic subsistence, often through social investment, as opposed to extraction, of agricultural surplus. I suggest that the moral *ecology* is one that guarantees the basic sustainability of both society and environment through investment in exchange relations of great time depth and spatial breadth.

up the changes that have come to their familiar landscape in recent decades as follows<sup>28</sup>:

<i>'Batu sudah berubah</i>	((Even) The stones have changed,
<i>gunung sudah berinsit</i>	(Even) The mountains have fallen.
<i>Gunung tidak bermacam</i>	The mountains have no panthers,
<i>telok tidak bernaga'</i>	The river holes have no dragons.)

The change in the stones and mountains cited here is associated with an explicit 'disenchantment' of the landscape (which transcends, as the use of these metaphors implies, normal instances of episodic destruction). Stones and mountains are not supposed to change; and when they do, it signifies something that transcends – and thus violates – the normal cosmological order of creation and destruction.

The principles of this cosmological order are well applied in the farming system that still predominates throughout the interior of Borneo (and the rest of Indonesia's outer islands): swidden agriculture. The cyclic linkage of creation and destruction is obviously central to this system: the sudden destruction of the forest by fire (albeit preceded by a lengthier period of slashing and felling) creates the swidden; whereas the gradual destruction of the swidden, through both natural and anthropogenic processes of afforestation, recreates the forest.<sup>29</sup> An emphasis on distribution versus accumulation is also central to the swidden system. The successful operation of the swidden system among a people like the Kantu', in the face of formidable environmental constraints, is made possible only by a strong emphasis on socio-economic exchange (of labour and grain). The existence of environmental constraints on the timing of planting, weeding, and harvesting obliges swidden operators to exchange labour with one another to cope with these labour 'bottlenecks'; and the inherent unpredictability of the environmental conditions that determine the eventual swidden harvest obliges each successful swidden operator to distribute grain to the less successful as an investment against the time when he or she also will be less lucky (Dove 1988:162). The accumulation of grain stores is socially sanctioned because it is seen as evidence of the violation of this principle. Finally, the principle that bounty bears a cost also applies to the swidden system. The Kantu' regard the outcome of the swidden cycle, the harvest, as the product of a series of explicit agreements between themselves and the spirits: if the Kantu' perform the requisite rituals and offer sufficient sacrifices to the spirits, they expect this to be reflected in a bountiful harvest. The Kantu' say, quite explicitly, that whatever they expend on ritual sacrifice will increase their favour

<sup>28</sup> Personal communication, Stepanus Djuweng, Institute of Dayakology Research and Development (Pontianak, West Kalimantan), 14 July 1994.

<sup>29</sup> This linkage between creation and destruction is also reflected in the pattern of forest land tenure, in which the destruction or clearing of the primary forest is the basis for creating rights to the succeeding regrowth (Dove 1985).

with the spirits and this will in turn increase their swidden returns sufficiently to minimally exceed their ritual expenditure (Dove 1988:151).

### III. Exchange in Rubber Cultivation

The principles of exchange just discussed (that is, as applying to the system of swidden cultivation) do not, for the most part, apply to the system of rubber cultivation.

#### 1. Bounty Without Cost or Distribution

The Kantu' do not believe that the bounty produced by rubber cultivation bears a cost in the way that the bounty produced by swidden cultivation does. It is true that when rubber was first introduced to the Dayak earlier this century, it was feared that the rubber trees would 'eat' the spirit of the swidden rice, and their commitment to rubber was moderated in response. I have elsewhere (Dove 1996) interpreted this as a cultural statement about the conflict between two different transactional orders, one (the swiddens) oriented towards the long-term subsistence needs of the group, and the other (the rubber) oriented towards the short-term market needs of the individual (Bloch and Parry 1989:23-4). These beliefs clearly say something about the 'cost' of rubber cultivation. In addition, there is some ritual associated with the marketing of rubber (Dove 1994:391), which might be interpreted within a framework of human-spirit exchange. In general, however, the explicit system of beliefs that pervades and dominates the system of swidden agriculture, regarding the ritualized exchange of bounty between spirits and humans, is absent from the system of rubber cultivation. The fact that rubber lies outside this belief system is reflected in the fact that the rubber tree is not included among the earlier-mentioned four trees which receive four of the seven pigs that are sacrificed on the occasion of a major sexual offence.<sup>30</sup>

Associated with the lack of (belief in) exchange between humans and spirits in rubber production is the lack of (belief in) exchange among humans. Thus, little or no inter-household reciprocity or exchange is involved in providing the inputs to rubber cultivation (the foremost of which is labour) or consuming the outputs (that is, sheets of rubber), in sharp contrast to the inputs and outputs of swidden cultivation.<sup>31</sup> (Unlike

<sup>30</sup> The fact that rubber lies outside the system of exchange that encompasses swidden agriculture (and most other subsistence-oriented activities) is reflected in the very ability of the Kantu' to make the statement that 'land planted in rubber is dead', if we interpret this statement to mean that land planted in rubber has ceased to participate in the system of land use and classification that applies to all other land. That is, a prerequisite to the statement that 'something falls outside a given system of transactions and meanings X' is the existence of an alternative system of transactions and meanings Y.

<sup>31</sup> The income from rubber tapping may also be used to support systems of reciprocal exchange: the most common example is the use of rubber income to purchase commercial *arak*

the situation in swidden cultivation, there are no ecological imperatives for such exchange: the seasonal variables and labour bottlenecks that necessitate such exchange in swidden production are absent from rubber production.) There also is greater commoditization in rubber cultivation of inputs such as labour, and greater separation of the labourer from the product of his/her labour, than is the case in swidden rice cultivation. Thus, while sharecropping is unknown in swidden cultivation, it is commonly practised in rubber cultivation (by the *bagi dua*, 'split in two', system, whereby labourers who have no rubber trees of their own tap the trees of others in exchange for one half of the yield).<sup>32</sup>

## 2. Bounty Without Creation and Destruction

Just as there is no social exchange in rubber cultivation, so there is no ecological exchange: there is no automatic cycling back and forth between rubber and forest. Unlike most of the economic plants planted by the tribal peoples of Borneo on their swidden sites, rubber does *not* succumb to the secondary afforestation that the natural environment precipitates on these sites; rather, it *becomes* the succession.<sup>33</sup> In its native habitat in South America, rubber is a denizen of mature forest, not of younger successions (Dean 1987:60). To begin with, rubber trees are long-lived: individual rubber trees can have a productive life of thirty to forty years. This does not mean that the life of the rubber garden is limited to thirty to forty years, however, because naturally grown seedlings typically replace the planted trees with a second generation of trees. Further repetitions of this natural process make the productive life of rubber groves potentially open-ended. In practice, however, the productivity of older rubber groves tends to decline. Gouyon, De Foresta, and Levang (1993:194) argue that the impact of shade on seedling growth will result in a drop in tree density in the third and higher generations (as the spacing of the rubber trees moves from the artificial spacing of 500/hectare in rubber groves towards the 2-3/hectare that naturally obtains in the Amazon), which eventually makes the rubber grove unprofitable to tap. Indeed, it is not uncommon for Dayak

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(distilled spirits) for use in ceremonial feasts (which are part of a wider regional system of exchange (Dove 1988)). However, if rubber income is *not* used for this purpose, there are no social sanctions; whereas there *are* sanctions against holding back the (surplus) produce of the swidden rice system from this system of ceremonial exchange.

<sup>32</sup> The distinct, market-oriented transactional order of rubber cultivation is reflected in the use of an adopted Malay expression, *bagi dua* 'split in two', for sharecropping, instead of a native Kantu' expression.

<sup>33</sup> Rubber thrives well amid the natural afforestation that takes place on fallow swidden plots (Rambo 1982:282). Indeed, this afforestation, which was accepted by smallholders but was initially fought by the estates (in an ill-conceived 'clean-weeding' policy), does not threaten but actually enhances the productivity of the rubber by increasing shade, air temperature, and humidity in the smallholding, all of which promote quicker bark renewal after tapping (Bauer 1948:58; Pelzer 1978:283).

to clear older rubber groves for new swiddens.<sup>34</sup> Such re-entry into the swidden cycle does not alter the status of the land as *tanah mati* (dead land), however. The Kantu' say that land once planted in rubber is still *mati* (dead) even if all that rubber itself dies.<sup>35</sup>

The non-participation of rubber land in these exchanges, whether ecological or social, is reflected in tenurial practices (this is the clearest 'practice' behind the rhetoric of 'dead land'). For example, after a Kantu' *bilek* (household) has undergone partition, its swidden forest land will continue to be held in common (*kuntsi*) by the resultant households (at least until the children of those effecting the partition are mature and begin to make their own swiddens (Dove 1985)); any rubber groves, however, will be divided. Similarly, if a household moves out of a longhouse, its forest lands must be returned to the longhouse to be held and used in common, but not so its rubber groves; the departed household can continue to exercise exclusive proprietary rights to these groves. The adoption of rubber thus resulted in the development of a special tenurial category for land under rubber, as distinct from ordinary swidden regrowth land.<sup>36</sup>

The phrase 'dead land' (that is to say, land under rubber) clearly does not have anything to do with 'death' as we know it. Further insight into its meaning is provided by the use in this phrase of not the Kantu'/Iban term for death, *parai*, but the Malay term, *mati* (Richards 1981:210, 254-5; Wilkinson 1959 II:749-50).<sup>37</sup> The use, in the first place, of a Malay versus an Iban term (*mati* versus *parai*) reflects the distinction between the more locally oriented transactional order of swidden production and the trans-

<sup>34</sup> This is an alternative explanation for the clearing of rubber to Pelzer's (1945:24-5) interpretation of a rubber-induced shortage of land for swiddens: 'In Bengkalis in the East Coast of Sumatra a few years ago, rubber gardens occupied so large an area that there was actually a scarcity of land suitable for the making of new ladangs for food crops, and rubber trees had to be cut down'. It may have been the clearing (for swiddens) of old and unproductive rubber groves that Pelzer witnessed and interpreted as evidence of land scarcity. Another possibility is that the Bengkalis people initially planted larger areas of rubber than they needed in order to strengthen land claims (see the comment by Gouyon, De Foresta, and Levang (1993:192-3) in note 47 below), and subsequently, once their tenure was secure, they cleared some of the very same rubber for swiddens. Aside from the clearing of rubber groves because of age or tenurial considerations, however, there should be little clearing of rubber for swiddens. The fact that smallholders like the Kantu' tend to plant rubber on land that is not ideal for swidden agriculture helps to minimize the necessity of this (Dove 1993:141-2).

<sup>35</sup> The Kantu' say that this same rule applies to land planted in fruit trees: it remains *mati* (dead) even if the fruit trees themselves die. In this respect (among others), land under either planted rubber or planted fruit trees is distinguished from land under either natural fruit trees or swiddens. Whereas planted fruit and rubber trees partake of the same 'otherness', the distinction is greater in the case of the rubber because it is not native to Southeast Asia (for example, whereas some cognitive violence will turn planted fruit trees into natural ones, no amount of it will make *Hevea* rubber trees anything less than cultivated).

<sup>36</sup> At the same time, the adoption of rubber contributed to some historic changes in the tenurial status of swidden regrowth land, involving the progressive shift of the balance of control from the longhouse to the household (Dove 1985).

<sup>37</sup> Nor, when talking about the 'dead land' of rubber, is the Kantu'/Iban term *bunuh/bunoh* (to kill (the land)) ever used (Richards 1981:56).

actional order of rubber, which is more oriented towards markets and the wider society (which was traditionally Malay-speaking). Further, the Malay term *mati* here does have the literal meaning of 'death', but also has the figurative meaning of 'fixed' (Wilkinson 1959 II:749-50), which dominates its uses in Iban (Richards 1981:210). Accordingly, we can interpret the phrase *tanah mati* (dead land) as a statement about how the combined ecological and social consequences of planting rubber 'fix' the land – within the context of a wider (swidden) landscape that is by implication *not* fixed. Nor, counter-intuitively, does this 'fixing' of the land mean its death. In a sense, land planted in rubber is 'dead' forever because the rubber is (at least potentially) alive forever (just as the accumulation of wealth from rubber trees is unending because of the lack of social exchange in its cultivation). The value against which rubber cultivation is being measured is not, therefore, life or death, but rather the cycle between life and death, creation and destruction, field and forest, that was described earlier. Unending life without death jeopardizes this value, just as does unending accumulation without distribution. The former severs the ecological cycle of creation and destruction, the morality of exchange between nature and culture; whereas the latter severs the economic cycle of inter-dependence and reciprocity, the morality of exchange between people.

Whereas Malay language came into the Dayak communities with the rubber, this does not necessarily mean that its meanings did as well. All of the complex connotations of *tanah mati* mentioned in the preceding paragraph do *not* derive from the Malay language. The Kantu' and other Dayak did not simply 'borrow' *tanah mati* from the Malay, therefore; they appropriated and reconstructed the term, just as they appropriated and reconstructed rubber itself (that is, the system of cultivation of rubber).

### 3. The Rubber-Swidden Fit and the Threat of Subsidy

The relationships between systems of cash-cropping and systems of swidden cultivation have not been well interpreted, even by such respected scholars as Pelzer (1945) and Wolf (1982). Both argue (Pelzer 1945:24-5; Wolf 1982:330) that cash crops like tobacco and pepper 'fitted' into native swidden systems during the colonial era (Wolf (1982:330) even uses the term 'symbiosis' to describe the relationship between tobacco and swidden cultivation), whereas rubber competed with and disrupted these systems.<sup>38</sup> Thus, Pelzer (1945:25) writes:

'Although this modification of the old economy [by planting perennials in swiddens] has led to permanent gardens of rubber, coconut, and benzoin trees and thus to a partial abandonment of shifting cultivation, where pepper and coffee

<sup>38</sup> See Sherman's (1980:127) critique of Pelzer.

supplement the traditional crops of the shifting cultivator, no fundamental change takes place, because *these* [added] gardens are not permanent'.

Wolf (1982:330), on the basis of Pelzer's research, writes:

'In this area [Deli, Sumatra], the Dutch had long grown tobacco on plantations, which developed in symbiosis with the slash-and-burn agriculture of local Malay and Batak villagers. The plantation took over the labor of burning off the covering vegetation. It then raised the first crop, tobacco. When productivity decreased in the second year, the plantation opened a new field, allowing the villagers to take over the tobacco plots in order to raise food. When rubber was introduced in 1906, this symbiotic relationship came to an end. Rubber trees were a perennial crop and could not be alternated with annuals. Instead, rubber cultivation, carried on by imported Javanese and Chinese laborers, now engulfed the subsistence plots of the native population.'

Their view is partially correct, in narrow agronomic terms, as can be seen in the case of black pepper (*Piper nigrum*). Pepper cultivation, unlike rubber cultivation, has a highly deleterious impact on the land. The Kantu', for example, say that pepper removes all of the *lang* (scent) from the land and that land used for pepper cultivation is thereafter *kusi* (barren).<sup>39</sup> The exactions of pepper cultivation are reflected in the short productive life of pepper gardens: the average Kantu' pepper garden can be cultivated for a maximum of seven to eight years, after which it must be abandoned. Pelzer and Wolf are *partly* right in thinking that this pattern of land use in some sense resembles and thus 'fits' in with swidden cultivation. The same fundamental ecological principle underlies both systems of cultivation: cultivation exhausts available nutrients, which obliges a cessation in cultivation until such time as the nutrient base is restored.<sup>40</sup> The similarity (in this respect) between pepper cultivation and swidden cultivation is reflected in the fact that the Kantu' do *not* say that land used for pepper is 'dead' but only that it is 'barren'.

The ecological principles underlying rubber cultivation are quite different. In rubber cultivation, the decline in productivity of older gardens is much more gradual and it is not driven by a decline in the stock of available nutrients; rather, it is driven by the natural progression of older

<sup>39</sup> The Kantu' say that the only thing that they can grow on the site of a former pepper garden is rubber.

<sup>40</sup> In less narrow terms, however, pepper cultivation must be seen as differing considerably from a typical system of swidden cultivation. Bartlett (1957:385), who routinely problematized 'common-sense' views of traditional systems of resource use, correctly notes that 'Pepper might indeed seem to be "shifting" if abandoned after being found unprofitable, but still pepper [...] plantings would probably belong to the village-horticulture aspect of agriculture rather than to shifting cultivation properly so called [...]'. In fact, the 'shifting' character not only of pepper cultivation but also of swidden cultivation can be called into question. Whereas some swidden systems are based on a true pioneering pattern entailing abandonment of used swidden lands, many are based on a cyclical or circulating pattern that entails only temporary following of used swidden lands (so as to be able to reap the economic advantages of clearing secondary forest instead of primary forest) (Padoch 1982).

gardens towards a lower density of rubber. Rubber cultivation resembles swidden cultivation and pepper cultivation in that the act of cultivation eventually undermines the conditions necessary for its continuation or reproduction, but the principles by which this takes place differ: whereas in the case of tobacco, pepper, and most swidden crops, the process is driven by a (fast) shift to a younger, impoverished succession, in the case of rubber the process is driven by a (slow) shift to an older, richer succession. There is a clear opposition between the two processes: whereas the former interrupts and holds in abeyance natural processes of vegetative succession, the latter enhances them; whereas land subject to the latter process becomes 'fixed' or 'dead', land subject to the former process remains unfixed (or alive). In terms of this opposition, rubber can indeed be seen as 'competing' with swidden cultivation, as Pelzer (1945:25) and Wolf (1982:330) suggest. But the significance of this 'competition' needs to be interpreted in light of the extraordinarily successful history of joint swidden and rubber cultivation.

Despite the seemingly poor fit between rubber and swidden cultivation, the spread of their composite system of agriculture has been very successful, as measured by the number of people involved and their contribution to the international rubber trade. This success is explained by the fact that the combination of rubber and swidden cultivation has been politically as well as economically empowering (Dove 1993, 1994, 1996). This empowerment is a function not just of the relationship of the rubber system to the swidden system, but of the significance of this relationship in the wider complex of colonial and post-colonial political-economic relations within which the adoption of cash crops by swidden cultivators is situated. In this wider context, any 'fit' between a system of cash-cropping and a system of subsistence agriculture bears a risk: it may be seized by superordinate political and economic authorities as an opportunity to 'piggyback' a centralized regime of extractive agriculture on a local regime of subsistence agriculture, so that the latter subsidizes the costs of the former. It is clear that this is what happened with tobacco and swidden cultivation in Deli, Sumatra.

The colonial tobacco planters and swidden cultivators of Deli did not contribute equally to their so-called symbiosis. Wolf (1982:330) implies that the swidden cultivators benefited because 'The plantation took over the labor of burning off the covering vegetation'; but burning is actually the briefest stage by far of the swidden cycle, taking (in successful cases) as little as an hour or two to complete. The slashing and felling of the forest that precede the burn, in contrast, are onerous tasks; and by integrating their tobacco into the Deli swidden cycle, the planters could avoid expending this labour themselves. This arrangement was ironic, in that colonial planters were in effect drawing a subsidy from a traditional system of agriculture that was otherwise fiercely criticized and suppressed

by the colonial establishment. This irony reached a peak in the famous *taungya* system of colonial Burma, in which colonial teak cultivation piggybacked on indigenous swidden cultivation. Bryant (1994) has exposed the dual and 'paradoxical' function of *taungya*, noting that it was intended to extract an economic surplus from the swidden peoples (in the form of assistance with the replanting of teak) at the same time as it was intended to eliminate this system of cultivation (by gradually putting all forested swidden lands under state teak plantations).<sup>41</sup>

In the end the Burmese swidden cultivators did not succumb to the *taungya* system (Bryant 1994:249-50). The potentially debilitating effects of such subsidies of state enterprise are well documented in Geertz's (1963) study of the piggybacking of colonial (and post-colonial) sugar-cane cultivation on peasant wet rice cultivation in Java.<sup>42</sup> Where there is a threat of having to provide such subsidies, therefore, a system of cash-cropping that offers – by means of its goodness of fit – the requisite easy avenue into local systems of resource use is not empowering; and one that does not have this fit, like rubber, is empowering. In this sense, the lack of fit between rubber and swidden cultivation, and the 'death' of the land under rubber, indicate social and ecological relations that are sustainable as opposed to unsustainable from the local perspective.<sup>43</sup>

#### 4. *The Rubber-Swidden Fit and the Benefit of Tenure*

The lack of fit (in the foregoing sense) between rubber and swidden cultivation, and the consequently diminished ability of outside authorities to wrest a subsidy from swiddens for rubber, is likely to have contributed to the development of a policy by colonial and post-colonial political and economic authorities to support the development of the plantation rubber sector, as opposed to the smallholder rubber sector.<sup>44</sup> The existence of this

<sup>41</sup> Pelzer calls the articulation between teak forestry and indigenous swidden cultivation 'ingenious'. He writes, 'It is ingenious in that it recognizes the habits of the shifting cultivator and fits them into a modern forest economy instead of persecuting the cultivator and forcing him to give up his traditional culture' (Pelzer 1945:31). Pelzer does not explicitly address the issue of who benefits from this ingenuity (aside from the negative benefit for the swidden cultivators of not being persecuted), but his summary of the *taungya* system implies that it is the government forester: 'The *taungya* forestry system is an excellent way of getting pure stands of commercial timber. The typical forest of the tropics is expensive to exploit because of the large variety of trees which it contains, many of which have little or no commercial value.' (Pelzer 1945:31.)

<sup>42</sup> Cultivation of sugar-cane fitted well, agronomically, into the cultivation of wet rice. The fit was so good that – in the context of colonial and post-colonial prioritizing of sugar production – peasant wet-rice production wound up subsidizing state sugar production, which contributed to the former's historic failure to develop, its 'involution' (Geertz 1963).

<sup>43</sup> Conversely, the so-called 'fit' of pepper and swidden cultivation indicates locally unsustainable social and ecological relations (Dove 1997; Schneider 1995:31-2).

<sup>44</sup> Of course, plantation agriculture may still extract a subsidy from swidden cultivation by paying less than a living wage to wage labourers and obliging them to make up the difference (and thereby continue to assume some of the responsibility for the reproduction of their labour) by continuing their involvement in subsistence agriculture.

smallholder system beyond the control of central political-economic authorities, and in direct competition with their plantation system, had a predictable impact on the way that smallholder rubber has been viewed and publicly represented by these authorities. Colonial authorities believed the rubber smallholdings to be diseased and over-exploited (Dove 1996:40-1), and colonial and post-colonial authorities alike have disparaged them as *hutan karet* (rubber jungles) (Gouyon, De Foresta, and Levang 1993:182).<sup>45</sup> This exogenous term, which contrasts with indigenous terms like *kebun getah* (rubber gardens) that are used in West Kalimantan, implicitly denies the history of human labour involved in the production of rubber gardens by likening them to (wild) 'jungles' as opposed to (domesticated) 'gardens' (see Williams 1980:78).

This exogenous emphasis on the 'wild' and 'unworked' character of the smallholder rubber plantings is no accident: it reflects tension over tenurial issues. In the colonial as well as post-colonial state systems governing Indonesian Borneo, land involved in swidden cultivation cycles has been accorded little or no tenurial recognition. In contrast, some recognition *is* accorded, however reluctantly, to smallholder rubber plantings (as reflected in the sarcastic challenge implied by the 'rubber jungle' epithet).<sup>46</sup> Indeed, the fact that rubber plantings receive this recognition from the state has become a principal motivation among smallholders for planting rubber.<sup>47</sup> It is probably inevitable that a production system that receives this much recognition from the overarching state system, and that fits well into this wider system, will *not* fit well into a local subsistence system like

<sup>45</sup> When estate owners eventually abandoned their destructive 'clean-weeding' policy and began to emulate the smallholder practice of allowing spontaneous afforestation to engulf their rubber groves, the view of the 'jungle' underwent an expected reversal: the negatively loaded phrase 'rubber jungle' became the positively loaded phrase 'rubber forestry'. Pelzer (1945:78) writes as follows:

'There are two principal means of protecting the soil between tree crops: by allowing the growth of indigenous plants or weeds (in other words, the development of a naturally mixed cover), or by establishing a pure cover of leguminous plants, many of which came originally from the New World. Rubber planters in Malaya seem to have had more success with the first method, which has been called "the forestry method of cultivation" or "rubber forestry".'

<sup>46</sup> This was one of the factors that probably drove the replacement of indigenous Bornean latexes (such as *gutta percha* and *jelutong*) by the introduced Para rubber. Exploitation of the native latexes, which relied on the same principles of destruction and creation, reciprocity and exchange, as swidden agriculture, did not receive any tenurial recognition from extra-local authorities, and this rendered the role of native tappers in the system constantly open to challenge (Dove 1994).

<sup>47</sup> This motivation holds throughout Indonesia. Gouyon, De Foresta, and Levang (1993:192-3) write about the situation in southeast Sumatra, for example (see also Dove 1985; Heersink 1994:54 n. 24):

'Most farmers in the area lack official land titles; yet rubber contributes to family wealth by bearing witness to land occupancy. An area covered with rubber is usually regarded by local land right as belonging to the planter, and as such can be inherited or sold. Planted land can also be claimed as an individual asset in case of conflict over land property with the government or estate companies. In some areas, smallholders are planting rubber as fast as they can to occupy an uncultivated area before it is seized by such external bodies.'

the swidden system of the Dayak. In other words, it is probably inevitable that what thrives in the wider political-economic system will be 'dead' in the local system. Opposition to the local system was probably a prerequisite, by definition, for success in the extra-local system.

The local distinction between swidden and rubber cultivation is reproduced with regard to extra-local commercial forest exploitation. The swidden cultivating peoples of Borneo have been bedevilled over the past two decades by the explosive growth of logging concessions, called HPH (from *Hak Pengusahaan Hutan*), in Indonesian Borneo. Notwithstanding the fierce opposition between the logging concessionaires and the swidden cultivators – and, indeed, perhaps helping to explain this opposition – both rely on the operation of the same ecological dynamic, namely a natural cycle of artificial forest opening and natural forest closure. They differ in the greater magnitude of destruction precipitated by the logging concessions, compared with swidden cultivation, because of the scale of clearing involved, associated disturbance of the soil, road-building and immigration, and disinterest in subsequent cycles (and thus disinterest in promoting afforestation).

Notwithstanding all the ills attending logging concessions, Dayak activists say that they are less worried about them than about the HTI (from *Hutan Tanaman Industri*), or commercial tree plantations. The Dayak say that, whereas the logging concessions will eventually go away (even if not until after the last tree has been felled), the tree plantations may stay forever.<sup>48</sup> Whereas the logging concessions are part of a forest cycle (albeit one that may run to hundreds of years), the tree plantations are 'fixed', like the rubber gardens. This analogy is reflected in the fact that many tenurial conflicts that arise in the development of timber plantations involve locally owned rubber gardens, whereas most conflicts in the development of logging concessions involve locally owned and managed swidden lands. Therefore, whereas the 'fixedness' of the rubber gardens protects local landowners in the face of state encroachment, the 'fixedness' of the timber plantations dispossesses them.

#### IV. Exchange Between People and Trees

An important element in much of this discourse about exchange is some sort of relationship between people and trees.

<sup>48</sup> Personal communication, Stepanus Djuweng, Institute of Dayakology Research and Development (Pontianak, West Kalimantan), 14 July 1994. It has also been suggested that some HTI operators are motivated not by any desire to raise trees, but only by the lucrative government subsidies and forest-clearing rights that accompany HTI licenses (Bamba 1994). If this is so, it potentially calls into question the actual as opposed to theoretical longevity of some of the HTIs.

### 1. People-Tree Metaphors

Metaphoric linkages between people and trees (or more generally, between people and plants) afford many societies a mechanism for both conceiving of and structuring social relations (for examples from the Indo-Malay region, see J. Fox (1971) on the Rotinese of Eastern Indonesia; Sather (1990) on the Iban of Sarawak; and Sugishima (1994) on the Lionese of Central Flores). A traditional Javanese example of this is the folk-saying that a king is to his people as the tiger is to the forest (Moertono 1981:22).<sup>49</sup> A similar example from among the Aluund of southwest Zaire, presented by De Boeck (1994:461), is the saying that the people are to the king as animals (frugivores) are to a fruit tree.<sup>50</sup>

One of the most important metaphoric linkages of people and trees, with respect to ideologies of exchange, involves a comparison of age.<sup>51</sup> The dimension of age is implicit in most discussions of trees and other perennials in Indonesia: they are colloquially called *tanaman umur panjang* (long-lived plants) in Indonesian. The significance of this life-span lies in its comparison with the human life-span, as was illustrated in the earlier-mentioned proscription among the Merina of Madagascar of the planting of long-lived trees (Bloch 1989)<sup>52</sup> and among the Kantu' of the use of long-lived timber. (In some cases, the fact that the life of a given tree exceeds the human life-span is accepted and constructively utilized: it is claimed that this is why durian trees (*Durio zibethinus* Murr.) are planted in West Kalimantan as tenurial markers.<sup>53</sup>) The significance of the human life-span being exceeded by the life-span of a planted or 'worked' tree is illustrated by the case of Kantu' rubber. The Kantu' say of land planted in rubber: *tanah mati s'umur idup* (the land is dead for as long

<sup>49</sup> A still current example of the metaphoric linkage of people and plants in Indonesia is the expression *ilmu padi*, which literally means 'rice knowledge' but which Echols and Shadily (1992:220) translate as 'the ability to be well educated but humble'. A common reflection of this body of norms and knowledge is the aphorism *Makin berisi, makin berunduk* (and its variant *Kian berisi, kian tunduk* (Schmidgall-Tellings and Stevens 1981:121)), 'The fuller [it is], the more [it] bends over'. This statement refers literally to the agronomic fact that the fuller a rice panicle is, the more it bends over. Metaphorically, it refers to the norm within Javanese (and to a lesser extent all Indonesian) culture that the more one has to say (for example), the quieter one is.

<sup>50</sup> Another example comes from the Kissi of Guinea, who use the phrase 'single forest' as a metaphor for political solidarity (Fairhead and Leach 1995:63).

<sup>51</sup> The comparison of tree age and people age is part of a wider set of metaphorical relations in which plant imagery is used to refer to human growth and reproduction (see Bourque (1995) on the Andes). The reverse also occurs. Thus, Visser (1989:82-3, 95-7) describes how the Sahu of Halmahera in Eastern Indonesia use metaphors of human reproduction to describe the cultivation and maturation of rice plants.

<sup>52</sup> The implication in the Merina belief that long-lived trees should only be associated with long-lived social groups is illustrated among the Huaorani of the Ecuadorian Amazon by the association of enduring peach-palm groves with long-term local endogamous groups on the one hand, and of short-term manioc gardens with ephemeral exogamous marriages and political alliances on the other (Rival 1993:648-9).

<sup>53</sup> Personal communication, Charles Peters, New York Botanical Gardens, 13 July 1994.

as (one) lives).<sup>54</sup> In this context, the meaning of *s'umur idup* is actually, and counter-intuitively, 'for longer than (one) lives'; that is, it means forever.<sup>55</sup> The significance of this open-ended life of the rubber grove, in comparison with the finite life of humans, is reflected in the fact that rubber occupies an entirely different transactional order.

Comparison of age between people and trees is often part of a wider belief in shared interest and welfare between people and trees. Stories like the following, from the former kingdom of Banjar on the southeast coast of Borneo, are common. The Banjar court chronicle tells of a battle in which the king's standard fell to the ground and was re-erected with a branch of the *jingah* tree<sup>56</sup> (Ras 1968:175-6, 432, 438). This pole took root and grew; and then, whenever it lost a branch in still weather, this foretold the imminent death of a member of the royal family.<sup>57</sup> A constructed identification of person and tree was found traditionally among some of the Dayak groups of southwest Borneo, as described by Frazer (1951:790):<sup>58</sup>

'Amongst the Dyaks of Landak and Tajan, districts of Dutch Borneo, it is customary to plant a fruit-tree for a baby, and henceforth in the popular belief the fate of the child is bound up with that of the tree. If the tree shoots up rapidly, it will go well with the child; but if the tree is dwarfed or shriveled, nothing but misfortune can be expected for its human counterpart.'

One of the closest identifications of all between person and tree was achieved in the traditional treatment of the dead among some Bornean tribes: there are several nineteenth-century accounts of burying the dead in apertures in living trees (which then grew around the bodies) (Maxwell 1992:8-9).<sup>59</sup>

The identification of people and trees may also be achieved at the

<sup>54</sup> The fact that this status is unchanged by the death of the rubber trees themselves affirms that it is not the life of the trees that is referred to here, but the life of the planters.

<sup>55</sup> See Wilkinson (1959, I:407, 418, II:1265) for the meaning of the Malay phrase *s'umur idup* (literally 'for the age of life').

<sup>56</sup> This has been variously identified as either the fig tree (*Ficus benjamina* Linn.) or what the Malays call the *rengas* tree, standing for a group of trees (mostly *Anacardiaceae*) with an irritating sap (Ras 1968:175-6, 176 n. 5, 543; Wilkinson 1959, II:964-5).

<sup>57</sup> A desire to avoid this sort of identification is found in practices like that of the Kuna Yala of Panama, who will not use *Tachigalia versicolor*, which dramatically flowers once and then dies, for fear that they might follow suit (Archibold and Davey 1993:55).

<sup>58</sup> Thongmak and Hulse (1993:162) similarly report that among the Karen of highland Burma and Thailand, after the birth of a child, the afterbirth is placed in the crook of a branch of a large tree (which exemplifies life and longevity); and thereafter, the health and well-being of the child are linked to this tree.

<sup>59</sup> Some Iban groups link the welfare of the human soul with the welfare of a mythical plant. Freeman (1967:323n) writes: 'It is believed by the Iban that every soul has a counterpart or *ayu*, which takes a plant-like form. These *ayu* grow on a mythical mountain where they are tended by celestial shamans. An *ayu* is said to be in mystical symbiosis with the individual to whom it belongs, and its appearance is supposed to reflect his state of health.' Sather (1990:37) similarly writes of the Iban: 'Every living human being is represented, not only by a conjunction of body (*tuboh*) and spirit or soul (*semengat*), but by an invisible plant counterpart, the *ayu*, which symbolizes human life in its vulnerable, mortal aspect'.

level of the entire cosmos. The conception of the cosmos as a 'tree of life' is common throughout Indonesia<sup>60</sup> (indeed, throughout the world). The Ngaju tree of life was mentioned earlier, along with the belief that its cyclic creation and destruction betokens the creation and destruction of the cosmos. The key elements underlying this vision – the linkage of creation and destruction, and the related concept of an exchange between life and death and between culture and nature – are reflected in the Kantu' beliefs that when the (forest) spirits provide excessive bounty, as in a mast fruiting, they will exact a price in human dead, and conversely, when humans engage in excessive 'consumption' by committing sexual offences, they must atone by making sacrifices to the spirits.<sup>61</sup>

## 2. Theories About People-Tree Metaphors

This discussion of the identification of people and trees has implications for recent attempts to 'denaturalize' the tree as a conceptual structure, as in Bouquet's (1995) analysis of four 'trees' (Dubois' family tree of *Pithecanthropus erectus*, Haeckel's phylogenetic diagram of human evolution, the Tree of Jesse showing Christ's earthly ancestry, and River's genealogical tree for anthropological inquiry). Bouquet (1995:44) suggests that unthinking commitment to tree-like conceptual structures is reflected in the fact that evolutionary theory contested the biblical creation story but borrowed the same genealogical motif to represent its own version: 'This replication of the genealogical motif seemed to me a very clear example of how scientific discourse is rooted in what I will call local cultural discourse'. She cites Bourdieu's (1977:38) critique of anthropology's preference for official or logical, as opposed to practical, genealogical trees<sup>62</sup>; she also cites Deleuze and Guattari's (1987) discussion of tree-based versus rhizome-based models of reality (Bouquet 1995:42,51).

<sup>60</sup> An example is the Javanese *gunungan* (which literally means 'mountain-shaped' (Horne 1974:225)), a shadow-play figure depicting all manner of life grouped on a giant tree.

<sup>61</sup> The relationship between humans and spirits, and between culture and nature, is addressed explicitly in the symbolism of Dayak headhunting. Davison and Sutlive (1991: 191, 203) write:

'Trophy heads are like the fruit of the forest: they are gathered, and their seed is planted to provide the Iban with sustenance [...] In symbolic terms, to take heads is to gather the fruits of the forest: Iban warriors must go headhunting, to bring back the fruit of the mythical *ranyai* palm and thereby supply their community with the means for their continued existence, namely rice seed and children.'

In headhunting, therefore, human death is linked to the life of both crops and people; and just as the spirits are seen as taking the eyes of humans in exchange for giving them fruit, so headhunting is seen as taking human heads *as* fruit. The image of fruiting, and fruit gathering and consumption, is a key linkage between people and trees, between human-culture and spirit-nature.

<sup>62</sup> Bourdieu (1977:38) writes: 'The genealogical tree constructed by the anthropologist, a spatial diagram that can be taken in at a glance, *uno intuitu*, and scanned indifferently from any point in any direction, causes the complete network of kinship relations over several generations to exist as only theoretical objects exist, that is, *tota simul*, as a totality present in simultaneity'.

Deleuze and Guattari's discussion is sufficiently interesting to merit citation at some length. They write (1987:18):

'It is odd how the tree has dominated Western reality and all of Western thought, from botany to biology and anatomy, but also gnosiology, theology, ontology, all of philosophy [...] The West has a special relation to the forest, and deforestation; the fields carved from the forest are populated with seed plants, produced by cultivation based on species lineages of arborescent type; animal raising, carried out on fallow fields, selects lineages forming an entire animal arborescence. The East presents a different figure: a relation to the steppe and the garden (or in some cases, the desert and the oasis), rather than forest and field; cultivation of tubers by fragmentation of the individual; a casting aside or bracketing of animal raising, which is confined to closed spaces or pushed out onto the steppes of the nomads. The West: agriculture based on a chosen lineage containing a large number of variable individuals. The East: horticulture based on a small number of individuals derived from a wide range of "clones". Does not the East, Oceania in particular, offer something like a rhizomatic model opposed in every respect to the Western model of the tree?'

Deleuze and Guattari are correct in suggesting that there are important differences – beyond the obvious agronomic ones – between systems of production based on vegetative propagation and systems based on reproduction from seed. Deleuze and Guattari are wrong (and themselves fall prey to Orientalism), however, in characterizing the rhizome versus seed distinction as one of East versus West.<sup>63</sup> There are rhizomes in Western history just as there is seed in Eastern history – and the same holds true for trees, as is shown by the evidence from Borneo presented earlier in this paper.

Whereas efforts like those of Bouquet, Bourdieu, and Deleuze and Guattari to raise our consciousness about the use of 'embedded' tree models are instructive, any suggestion that such models have simple roots in Western culture ignores the environmental present and past of both East and West. The discussion in this paper of the 'identification' of trees and people in Borneo reflects the fact that most of human history, in most parts of the world, has involved an intimate relationship to – a struggle both with and against – trees. The antiquity and ubiquity of this relationship is reflected in the fact that the oldest trade good in the world may well be tree sap. Camphor (*Dryobalanops aromatica* Gaetn. F.), dammar (gum from a variety of dipterocarps, especially of the genera *Shorea*), 'dragon's blood' (*Daemonorhops* Blume, spp.), gum benjamin (*Styrax* spp.), and various pine resins (especially from *Pinus merkusii*) are the oldest international trade products of Southeast Asia; and the trade in them fits into a

<sup>63</sup> Other aspects of Deleuze and Guattari's dichotomy are flawed as well, notably their characterization of animal raising on fallow fields as Western and animal raising either in closed spaces or on open steppes as Eastern – a generalization that is invalidated by the data at least as often as it is supported.

niche that was originally created for the even more ancient traffic in the tree saps of the Middle East, the fabled frankincense (*Boswellia* spp.) and myrrh (*Commiphora* spp.). The value of such ancient tree products notwithstanding, there is often great ambivalence in conceptions of trees, in conformity with the earlier discussion of exchange and the linkage (in person-tree relations) between benefit and cost, and even between creation and destruction. This potential for ambivalence is reflected in the way that different types of societies view forests even today. In many contemporary hunter-gatherer societies, the forest is conceived of as an ever-giving parent (Bird-David 1990); whereas in many agricultural and state-type societies, the forest is conceived of as the principal obstacle to progress and the refuge of spirits, criminals, and enemies of the state: one common Javanese term for development, *babad alas*, literally means 'to clear the forest'.<sup>64</sup>

Another recent development in environmental thinking that has made the complexity of human conceptions of trees and forests more, not less, difficult to comprehend is environmental romanticism. Whereas the international conservation movement formerly idealized a concept of nature as both static and devoid of humans, over the past decade its thinking has evolved to the point where dynamism and people have been returned to nature. To some extent, however, the overly negative view of human environmental relations has been replaced by an overly romanticized view of them. The interest of global environmentalists in forging alliances with local communities (Breckenridge 1992) has stimulated efforts to construct and represent a 'primitive environmentalism' (Ellen 1986) – Brosius (1997: 59) calls it 'ecological etherealism' – that complements their own. This has resulted in painting a portrait of relations with nature in indigenous forest communities that is not simply rose-coloured, but whose colours are taken direct from the Western environmental tradition (Brosius 1997). Because of the normative context in which this portrait of the 'ecologically noble savage' (Redford 1990; Hames 1991) is painted, the give and take between society and environment – the creation and destruction, the exchanges such as have been described here – is missing from the picture.

### 3. Theories about Theories: Trunk-to-Tip and Sap versus Tree

These debates about tree versus root and tree-feller versus tree-hugger do not shed much light on the sort of material discussed in this study. The tree/root opposition was constructed by scholars interested in denaturalizing Western concepts that are rarely problematized; and the tree-feller/hugger opposition was constructed by scholars and activists critical

<sup>64</sup> The potential for ambivalence also is reflected in some contemporary academic views of the forest, for example in the debate as to whether the tropical forest presented a barren obstacle to, or a rich habitat for, early hunter-gatherers (Bailey et al. 1989; Brosius 1991; Headland 1987; Headland and Reid 1989).

of the natural resource and human rights policies of both Western and Eastern governments. In both cases, scholars approached the Eastern tradition not in an effort to reveal internal concepts, but in search of a privileged register from which to draw analogies in support of ongoing debates in other arenas. The result has been an approach to indigenous environmental thinking that has essentialized it and sundered ecology from society and local from extra-local.

Instead of drawing analogies between East and West, a more illuminating approach to indigenous conceptions of natural resources and the environment might consist in *comparing* the use of analogies or metaphors in East and West. J. Fox (1988) does this in an analysis of descent 'trees' in Roti. He notes that the meaning of the image of the 'tree' is far from given. He writes, 'Trees present protean forms. They can grow up but they can also grow outward. Some, like the waringin, can grow up and then set down new roots. Hence, tracing relations using the image of a tree can take many forms.' (Fox 1988:16.) He illustrates this point by noting that, whereas descent is conceptually represented by a tree in Roti, as in the West, the directional orientation of the two images is not the same. Thus he writes of Roti, 'Here we have the conception of an ancestral tree, which is the opposite of that of the West: instead of being read from the top down, as a form of descent, it is read from the bottom up as a kind of ascent – from trunk to tip' (Fox 1988:9).

Analogous comparisons can be suggested on the basis of the material presented in this study. It has been argued here that, because the socio-ecology of rubber opposes (and complements) the swidden cultivation cycle, the Dayak conceptually move it outside this cycle and say that the land under it has 'died'. In contrast, the Western plantation complex, in colonial as well as post-colonial times, has often focused not on the wider socio-ecological context of rubber production, nor even on the tree, but on particular interpretations of the sap/latex itself (which receives no attention whatsoever in Dayak cosmology). For example, in the colonial plantations (not smallholdings) of Indochina, according to Woodside (1976:210; cited in Murray 1992:60), the sap was called 'white gold' by the planters, whose workers countered by calling it 'white blood'. Shifting to the Western hemisphere, Schultes (1987:93-4), following the lead of a 1940s Brazilian novelist, calls the sap the 'blood of the gods'. The intimate, informed link between rubber tree and human being that is suggested by these powerful anthropomorphic images is deceptive. Thus, the Dayak believe in a special 'identity' between people and trees, but do not anthropomorphize the rubber<sup>65</sup>; conversely, and counter-intuitively, the anthropomorphizing of the trees in these Western plantation images is part of a further dichotomizing of nature and culture. Whereas the Dayak image of the

<sup>65</sup> The Dayak do, however, anthropomorphize rice (I am indebted to one of *Bijdragen tot de Taal-, Land- en Volkenkunde's* reviewers for reminding me of this fact).

'dead land' under rubber addresses the principal social and ecological parameters of rubber cultivation (as does the image of 'white blood', albeit to a lesser extent), the images of 'white gold' and 'gods' blood' address neither.

#### *V. Summary and Conclusion*

To recapitulate, the Kantu' of West Kalimantan say that swidden land that is planted in rubber trees becomes 'dead', which is initially puzzling because the combined cultivation of swiddens and rubber groves has proved to be one of Southeast Asia's most sustainable natural resource management systems. Ethnographic analysis in one rubber-producing region, on the island of Borneo, suggests that the meaning of 'dead land' is based on indigenous processes of social and ecological exchange, from which rubber is excluded. Three principles underlie this exchange: (1) bounty carries a cost; (2) bounty (or wealth) should be distributed, not accumulated; and (3) the creation and destruction of bounty are linked. None of these principles apply to the system of rubber production, which carries no such costs, in which distribution is not necessary, and in which there is no similar cyclic linkage between resource creation and destruction. These differences result in a lack of 'fit' between rubber and swidden cultivation at the local level. But at the extra-local level these same differences and this same lack of fit become not a liability but an asset: the lack of fit hampers access to the local subsistence base by extraction-oriented outsiders; at the same time, it facilitates access by locals to the powerful tenurial and resource regimes of outsiders. These indigenous conceptions of rubber plantings are part of a large class of metaphorical linkages of nature and culture. Recent theorizing about these linkages has been driven largely by debates in other arenas and has been weakened by an emphasis on finding and exploiting (but not problematizing) compelling environmental analogies.

This study shows that there is a distinct difference between the representations of the Kantu' and those of global environmentalists with respect to rubber. Whereas the Kantu' regard land planted under rubber as 'dying' (within the context of their swidden system), most environmentalists view rubber planting as sustainable agroforestry, the undertaking of which is believed to be 'reviving' for the land. Whereas the environmentalists see rubber as something so benign as to merit eco-labels for its wood in international markets, the Kantu' see rubber as something that fundamentally violates the principles of their system of sustainable tropical forest agriculture, yet is welcomed nonetheless precisely because of this violation. Identifying and analysing this difference may help to point the way to less essentialized Western representations of indigenous environmental beliefs as well as more nuanced Western conceptions of sustainable environmental relations.

From the preliminary analysis presented here, two conclusions can be drawn regarding the spatial and temporal dimensions of sustainability. First, there are no strictly local solutions to sustainability. The swidden-rubber system of the Kantu' described here, for example, is Janus-faced: it is oriented towards both local and extra-local needs, constraints, and opportunities. In an interconnected world, sustainable systems like this will not just partake of the interconnections, they will focus on them; they will focus on balancing the costs and benefits of these connections in a way that is sustainable for the local community. This balance necessarily involves the political as well as the economic arena: Dayak successes with rubber came at the expense, and in spite of the opposition, of a state-supported plantation sector. Sustainable development can no more be separated from issues of power than can any other kind of development.

The second conclusion is that there are no static solutions to sustainability: in a world of change, sustainability is, in part, necessarily *about* change; it is about incorporating change into what already exists, so as to protect existing advantages and diminish existing disadvantages. Thus, the swidden-rubber system of the Kantu' is not 'traditional', if by this term we mean something from an 'unchanging past'. It is as new to Borneo as the *Hevea* rubber on which it is based. The change implied in the phrase *tanah mati* 'dead land' reflects the changes in Dayak society that accompanied the introduction of *Hevea* rubber.<sup>66</sup> This was not simply a passive response to the 'introduction' of rubber, rather it was an aggressive pattern of 'adoption' that was designed to take advantage of a new element in the resource landscape.

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<sup>66</sup> This is not to suggest that Dayak society was 'traditional' and autochthonous before rubber and was changed only by rubber. On the contrary, Dayak society experienced transformations (analogous to those experienced in connection with rubber) in the prior boom in native forest latexes in the mid-nineteenth century (Dove 1994), and changes of other sorts before that. There was always, thus, a *history* as opposed to an 'unchanging past'.

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