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# The Price of Progress

John Bodley

*In aiming at progress... you must let no one suffer by too drastic a measure, nor pay too high a price in upheaval and devastation, for your innovation.*

Maunier, 1949: 725

UNTIL RECENTLY, GOVERNMENT planners have always considered economic development and progress beneficial goals that all societies should want to strive toward. The social advantage of progress—as defined in terms of increased incomes, higher standards of living, greater security, and better health—are thought to be positive, *universal* goods, to be obtained at any price. Although one may argue that tribal peoples must sacrifice their traditional cultures to obtain these benefits, government planners generally feel that this is a small price to pay for such obvious advantages.

In earlier chapters [in *Victims of Progress*, 3rd ed.], evidence was presented to demonstrate that autonomous tribal peoples have not *chosen* progress to enjoy its advantages, but that governments have *pushed* progress upon them to obtain tribal resources, not primarily to share with the tribal peoples the benefits of progress. It has also been shown that the price of forcing progress on unwilling recipients has involved the deaths of millions of tribal people, as well as their loss of land, political sovereignty, and the right to follow their own life style. This chapter does not attempt to further summarize that aspect of the cost of progress, but instead analyzes the specific effects of the participation of tribal peoples in the world-market economy. In direct opposition to the usual interpretation, it is argued here that the benefits of progress are often both illusory and detrimental to tribal peoples when they have not been allowed to con-

trol their own resources and define their relationship to the market economy.

## PROGRESS AND THE QUALITY OF LIFE

One of the primary difficulties in assessing the benefits of progress and economic development for any culture is that of establishing a meaningful measure of both benefit and detriment. It is widely recognized that *standard of living*, which is the most frequently used measure of progress, is an intrinsically ethnocentric concept relying heavily upon indicators that lack universal cultural relevance. Such factors as GNP, per capita income, capital formation, employment rates, literacy, formal education, consumption of manufactured goods, number of doctors and hospital beds per thousand persons, and the amount of money spent on government welfare and health programs may be irrelevant measures of actual *quality* of life for autonomous or even semiautonomous tribal cultures. In its 1954 report, the Trust Territory government indicated that since the Micronesian population was still largely satisfying its own needs within a cashless subsistence economy, “Money income is not a significant measure of living standards, production, or well-being in this area” (TTR, 1953: 44). Unfortunately, within a short time the government began to rely on an enumeration of certain imported consumer goods as indicators of a higher standard of living in the islands, even though many tradition-oriented islanders felt that these new goods symbolized a lowering of the quality of life.

A more useful measure of the benefits of progress might be based on a formula for evaluating cultures devised by Goldschmidt (1952: 135). According to these

less ethnocentric criteria, the important question to ask is: Does progress or economic development increase or decrease a given culture’s ability to satisfy the physical and psychological needs of its population, or its stability? This question is a far more direct measure of quality of life than are the standard economic correlates of development, and it is universally relevant. Specific indication of this *standard* of living could be found for any society in the nutritional status and general physical and mental health of its population, the incidence of crime and delinquency, the demographic structure, family stability, and the society’s relationship to its natural resource base. A society with high rates of malnutrition and crime, and one degrading its natural environment to the extent of threatening its continued existence, might be described as at a lower standard of living than is another society where these problems did not exist.

Careful examination of the data, which compare, on these specific points, the former condition of self-sufficient tribal peoples with their condition following their incorporation into the world-market economy, leads to the conclusion that their standard of living is *lowered*, not raised, by economic progress—and often to a dramatic degree. This is perhaps the most outstanding and inescapable fact to emerge from the years of research that anthropologists have devoted to the study of culture change and modernization. Despite the best intentions of those who have promoted change and improvement, all too often the results have been poverty, longer working hours, and much greater physical exertion, poor health, social disorder, discontent, discrimination, overpopulation, and environmental deterioration—

combined with the destruction of the traditional culture.

## DISEASES OF DEVELOPMENT

*Perhaps it would be useful for public health specialists to start talking about a new category of diseases.... Such diseases could be called the "diseases of development" and would consist of those pathological conditions which are based on the usually unanticipated consequences of the implementation of developmental schemes.*

Hughes & Hunter, 1972: 93

Economic development increases the disease rate of affected peoples in at least three ways. First, to the extent that development is successful, it makes developed populations suddenly become vulnerable to all of the diseases suffered almost exclusively by "advanced" peoples. Among these are diabetes, obesity, hypertension, and a variety of circulatory problems. Second, development disturbs traditional environmental balances and may dramatically increase certain bacterial and parasite diseases. Finally, when development goals prove unattainable, an assortment of poverty diseases may appear in association with the crowded conditions of urban slums and the general breakdown in traditional socioeconomic systems.

Outstanding examples of the first situation can be seen in the Pacific, where some of the most successfully developed native peoples are found. In Micronesia, where development has progressed more rapidly than perhaps anywhere else, between 1958 and 1972 the population doubled, but the number of patients treated for heart disease in the local hospitals nearly tripled, mental disorder increased eightfold, and by 1972 hypertension and nutritional deficiencies began to make significant appearances for the first time (TTR, 1959, 1973, statistical tables).

Although some critics argue that the Micronesian figures simply represent better health monitoring due to economic progress, rigorously controlled data from Polynesia show a similar

trend. The progressive acquisition of modern degenerative diseases was documented by an eight-member team of New Zealand medical specialists, anthropologists, and nutritionists, whose research was funded by the Medical Research Council of New Zealand and the World Health Organization. These researchers investigated the health status of a genetically related population at various points along a continuum of increasing cash income, modernizing diet, and urbanization. The extremes on this acculturation continuum were represented by the relatively traditional Pukapukans of the Cook Islands and the essentially Europeanized New Zealand Maori, while the busily developing Rarotongans, also of the Cook Islands, occupied the intermediate position. In 1971, after eight years of work, the team's preliminary findings were summarized by Dr. Ian Prior, cardiologist and leader of the research, as follows:

*We are beginning to observe that the more an islander takes on the ways of the West, the more prone he is to succumb to our degenerative diseases. In fact, it does not seem too much to say our evidence now shows that the farther the Pacific natives move from the quiet, carefree life of their ancestors, the closer they come to gout, diabetes, atherosclerosis, obesity, and hypertension.*

Prior, 1971: 2

In Pukapuka, where progress was limited by the island's small size and its isolated location some 480 kilometers from the nearest port, the annual per capita income was only about thirty-six dollars and the economy remained essentially at a subsistence level. Resources were limited and the area was visited by trading ships only three or four times a year; thus, there was little opportunity for intensive economic development. Predictably, the population of Pukapuka was characterized by relatively low levels of imported sugar and salt intake, and a presumably related low level of heart disease, high blood pressure, and diabetes. In Rarotonga, where economic success was introducing town

life, imported food, and motorcycles, sugar and salt intakes nearly tripled, high blood pressure increased approximately ninefold, diabetes two- to threefold, and heart disease doubled for men and more than quadrupled for women, while the number of grossly obese women increased more than tenfold. Among the New Zealand Maori, sugar intake was nearly eight times that of the Pukapukans, gout in men was nearly double its rate on Pukapuka, and diabetes in men was more than fivefold higher, while heart disease in women had increased more than sixfold. The Maori were, in fact, dying of "European" diseases at a greater rate than was the average New Zealand European.

Government development policies designed to bring about changes in local hydrology, vegetation, and settlement patterns and to increase population mobility, and even programs aimed at reducing certain diseases, have frequently led to dramatic increases in disease rates because of the unforeseen effects of disturbing the preexisting order. Hughes and Hunter (1972) published an excellent survey of cases in which development led directly to increased disease rates in Africa. They concluded that hasty development intervention in relatively balanced local cultures and environments resulted in "a drastic deterioration in the social and economic conditions of life."

Traditional populations in general have presumably learned to live with the endemic pathogens of their environments, and in some cases they have evolved genetic adaptations to specific diseases, such as the sickle-cell trait, which provided an immunity to malaria. Unfortunately, however, outside intervention has entirely changed this picture. In the late 1960s, sleeping sickness suddenly increased in many areas of Africa and even spread to areas where it did not formerly occur, due to the building of new roads and migratory labor, both of which caused increased population movement. Large-scale relocation schemes, such as the Zande Scheme, had disastrous results when natives were moved from their traditional disease-free refuges into infected areas. Dams and irrigation developments inadvertently cre-

ated ideal conditions for the rapid proliferation of snails carrying schistosomiasis (a liver fluke disease), and major epidemics suddenly occurred in areas where this disease had never before been a problem. DDT spraying programs have been temporarily successful in controlling malaria, but there is often a rebound effect that increases the problem when spraying is discontinued, and the malarial mosquitoes are continually evolving resistant strains.

Urbanization is one of the prime measures of development, but it is a mixed blessing for most former tribal peoples. Urban health standards are abysmally poor and generally worse than in rural areas for the detribalized individuals who have crowded into the towns and cities throughout Africa, Asia, and Latin America seeking wage employment out of new economic necessity. Infectious diseases related to crowding and poor sanitation are rampant in urban centers, while greatly increased stress and poor nutrition aggravate a variety of other health problems. Malnutrition and other diet-related conditions are, in fact, one of the characteristic hazards of progress faced by tribal peoples and are discussed in the following sections.

### The Hazards of Dietary Change

The traditional diets of tribal peoples are admirably adapted to their nutritional needs and available food resources. Even though these diets may seem bizarre, absurd, and unpalatable to outsiders, they are unlikely to be improved by drastic modifications. Given the delicate balances and complexities involved in any subsistence system, change always involves risks, but for tribal people the effects of dietary change have been catastrophic.

Under normal conditions, food habits are remarkably resistant to change, and indeed people are unlikely to abandon their traditional diets voluntarily in favor of dependence on difficult-to-obtain exotic imports. In some cases it is true that imported foods may be identified with powerful outsiders and are therefore sought as symbols of greater prestige. This may lead to such absurdities as Amazonian Indians choosing to consume

imported canned tunafish when abundant high-quality fish is available in their own rivers. Another example of this situation occurs in tribes where mothers prefer to feed their infants expensive nutritionally inadequate canned milk from unsanitary, but *high status*, baby bottles. The high status of these items is often promoted by clever traders and clever advertising campaigns.

Aside from these apparently voluntary changes, it appears that more often dietary changes are forced upon unwilling tribal peoples by circumstances beyond their control. In some areas, new food crops have been introduced by government decree, or as a consequence of forced relocation or other policies designed to end hunting, pastoralism, or shifting cultivation. Food habits have also been modified by massive disruption of the natural environment by outsiders—as when sheepherders transformed the Australian Aborigines' foraging territory or when European invaders destroyed the bison herds that were the primary element in the Plains Indians' subsistence patterns. Perhaps the most frequent cause of diet change occurs when formerly self-sufficient peoples find that wage labor, cash cropping, and other economic development activities that feed tribal resources into the world-market economy must inevitably divert time and energy away from the production of subsistence foods. Many developing peoples suddenly discover that, like it or not, they are unable to secure traditional foods and must spend their newly acquired cash on costly, and often nutritionally inferior, manufactured foods.

Overall, the available data seem to indicate that the dietary changes that are linked to involvement in the world-market economy have tended to *lower* rather than raise the nutritional levels of the affected tribal peoples. Specifically, the vitamin, mineral, and protein components of their diets are often drastically reduced and replaced by enormous increases in starch and carbohydrates, often in the form of white flour and refined sugar.

Any deterioration in the quality of a given population's diet is almost certain to be reflected in an increase in deficiency diseases and a general decline in

health status. Indeed, as tribal peoples have shifted to a diet based on imported manufactured or processed foods, there has been a dramatic rise in malnutrition, a massive increase in dental problems, and a variety of other nutritional-related disorders. Nutritional physiology is so complex that even well-meaning dietary changes have had tragic consequences. In many areas of Southeast Asia, government-sponsored protein supplementation programs supplying milk to protein-deficient populations caused unexpected health problems and increased mortality. Officials failed to anticipate that in cultures where adults do not normally drink milk, the enzymes needed to digest it are no longer produced and milk *intolerance* results (Davis & Bolin, 1972). In Brazil, a similar milk distribution program caused an epidemic of permanent blindness by aggravating a preexisting vitamin A deficiency (Bunce, 1972).

### Teeth and Progress

*There is nothing new in the observation that savages, or peoples living under primitive conditions, have, in general, excellent teeth.... Nor is it news that most civilized populations possess wretched teeth which begin to decay almost before they have erupted completely, and that dental caries is likely to be accompanied by periodontal disease with further reaching complications.*

Hooton, 1945: xviii

Anthropologists have long recognized that undisturbed tribal peoples are often in excellent physical condition. And it has often been noted specifically that dental caries and the other dental abnormalities that plague industrialized societies are absent or rare among tribal peoples who have retained their traditional diets. The fact that tribal food habits may contribute to the development of sound teeth, whereas modernized diets may do just the opposite, was illustrated as long ago as 1894 in an article in the *Journal of the Royal Anthropological Institute* that described the results of a comparison between the teeth of ten Sioux Indians were examined when they

came to London as members of Buffalo Bill's Wild West Show and were found to be completely free of caries and in possession of all their teeth, even though half of the group were over thirty-nine years of age. Londoners' teeth were conspicuous for both their caries and their steady reduction in number with advancing age. The difference was attributed primarily to the wear and polishing caused by the traditional Indian diet of coarse food and the fact that they chewed their food longer, encouraged by the absence of tableware.

One of the most remarkable studies of the dental conditions of tribal peoples and the impact of dietary change was conducted in the 1930s by Weston Price (1945), an American dentist who was interested in determining what caused normal, healthy teeth. Between 1931 and 1936, Price systematically explored tribal areas throughout the world to locate and examine the most isolated peoples who were still living on traditional foods. His fieldwork covered Alaska, the Canadian Yukon, Hudson Bay, Vancouver Island, Florida, the Andes, the Amazon, Samoa, Tahiti, New Zealand, Australia, New Caledonia, Fiji, the Torres Strait, East Africa, and the Nile. The study demonstrated both the superior quality of aboriginal dentition and the devastation that occurs as modern diets are adopted. In nearly every area where traditional foods were still being eaten, Price found perfect teeth with normal dental arches and virtually no decay, whereas caries and abnormalities increased steadily as new diets were adopted. In many cases the change was sudden and striking. Among Eskimo groups subsisting entirely on traditional food he found caries totally absent, whereas in groups eating a considerable quantity of store-bought food approximately 20 percent of their teeth were decayed. This figure rose to more than 30 percent with Eskimo groups subsisting almost exclusively on purchased or government-supplied food, and reached an incredible 48 percent among the Vancouver Island Indians. Unfortunately for many of these people, modern dental treatment did not accompany the new food, and their suffering was appalling. The loss of teeth was, of course, bad

enough in itself, and it certainly undermined the population's resistance to many new diseases, including tuberculosis. But new foods were also accompanied by crowded, misplaced teeth, gum diseases, distortion of the face, and pinching of the nasal cavity. Abnormalities in the dental arch appeared in the new generation following the change in diet, while caries appeared almost immediately even in adults.

Price reported that in many areas the affected peoples were conscious of their own physical deterioration. At a mission school in Africa, the principal asked him to explain to the native schoolchildren why they were not physically as strong as children who had had no contact with schools. On an island in the Torres Strait the natives knew exactly what was causing their problems and resisted—almost to the point of bloodshed—government efforts to establish a store that would make imported food available. The government prevailed, however, and Price was able to establish a relationship between the length of time the government store had been established and the increasing incidence of caries among a population that showed an almost 100 percent immunity to them before the store had been opened.

In New Zealand, the Maori, who in their aboriginal state are often considered to have been among the healthiest, most perfectly developed of people, were found to have "advanced" the furthest. According to Price:

*Their modernization was demonstrated not only by the high incidence of dental caries but also by the fact that 90 percent of the adults and 100 percent of the children had abnormalities of the dental arches.*

Price, 1945: 206

## Malnutrition

Malnutrition, particularly in the form of protein deficiency, has become a critical problem for tribal peoples who must adopt new economic patterns. Population pressures, cash cropping, and government programs all have tended to encourage the replacement of traditional

crops and other food sources that were rich in protein with substitutes, high in calories but low in protein. In Africa, for example, protein-rich staples such as millet and sorghum are being replaced systematically by high-yielding manioc and plantains, which have insignificant amounts of protein. The problem is increased for cash croppers and wage laborers whose earnings are too low and unpredictable to allow purchase of adequate amounts of protein. In some rural areas, agricultural laborers have been forced systematically to deprive nonproductive members (principally children) of their households of their minimal nutritional requirements to satisfy the need of the productive members. This process has been documented in northeastern Brazil following the introduction of large-scale sisal plantations (Gross & Underwood, 1971). In urban centers the difficulties of obtaining nutritionally adequate diets are even more serious for tribal immigrants, because costs are higher and poor quality foods are more tempting.

One of the most tragic, and largely overlooked, aspects of chronic malnutrition is that it can lead to abnormally undersized brain development and apparently irreversible brain damage; it has been associated with various forms of mental impairment or retardation. Malnutrition has been linked clinically with mental retardation in both Africa and Latin America (see, for example, Mönckeberg, 1968), and this appears to be a worldwide phenomenon with serious implications (Montagu, 1972).

Optimistic supporters of progress will surely say that all of these new health problems are being overstressed and that the introduction of hospitals, clinics, and the other modern health institutions will overcome or at least compensate for all of these difficulties. However, it appears that uncontrolled population growth and economic impoverishment probably will keep most of these benefits out of reach for many tribal peoples, and the intervention of modern medicine has at least partly contributed to the problem in the first place.

The generalization that civilization frequently has a broad negative impact on

tribal health has found broad empirical support (see especially Kroeger & Bar-bira-Freedman [1982] on Amazonia; Reinhard [1976] on the Arctic; and Wirsing [1985] globally), but these conclusions have not gone unchallenged. Some critics argue that tribal health was often poor before modernization, and they point specifically to tribals' low life expectancy and high infant mortality rates. Demographic statistics on tribal populations are often problematic because precise data are scarce, but they do show a less favorable profile than that enjoyed by many industrial societies. However, it should be remembered that our present life expectancy is a recent phenomenon that has been very costly in terms of medical research and technological advances. Furthermore, the benefits of our health system are not enjoyed equally by all members of our society. High infant mortality could be viewed as a relatively inexpensive and egalitarian tribal public health program that offered the reasonable expectation of a healthy and productive life for those surviving to age fifteen.

Some critics also suggest that certain tribal populations, such as the New Guinea highlanders, were "stunted" by nutritional deficiencies created by tribal culture and are "improved" by "acculturation" and cash cropping (Dennett & Connell, 1988). Although this argument does suggest that the health question requires careful evaluation, it does not invalidate the empirical generalizations already established. Nutritional deficiencies undoubtedly occurred in densely populated zones in the central New Guinea highlands. However, the specific case cited above may not be widely representative of other tribal groups even in New Guinea, and it does not address the facts of outside intrusion or the inequities inherent in the contemporary development process.

## ECOCIDE

*"How is it," asked a herdsman...  
 "how is it that these hills can no longer give pasture to my cattle?  
 In my father's day they were green  
 and cattle thrived there; today  
 there is no grass and my cattle*

*starve." As one looked one saw  
 that what had once been a green  
 hill had become a raw red rock.*

Jones, 1934

Progress not only brings new threats to the health of tribal peoples, but it also imposes new strains on the ecosystems upon which they must depend for their ultimate survival. The introduction of new technology, increased consumption, lowered mortality, and the eradication of all traditional controls have combined to replace what for most tribal peoples was a relatively stable balance between population and natural resources, with a new system that is imbalanced. Economic development is forcing *ecocide* on peoples who were once careful stewards of their resources. There is already a trend toward widespread environmental deterioration in tribal areas, involving resource depletion, erosion, plant and animal extinction, and a disturbing series of other previously unforeseen changes.

After the initial depopulation suffered by most tribal peoples during their engulfment by frontiers of national expansion, most tribal populations began to experience rapid growth. Authorities generally attribute this growth to the introduction of modern medicine and new health measures and the termination of intertribal warfare, which lowered mortality rates, as well as to new technology, which increased food production. Certainly all of these factors played a part, but merely lowering mortality rates would not have produced the rapid population growth that most tribal areas have experienced if traditional birth-spacing mechanisms had not been eliminated at the same time. Regardless of which factors were most important, it is clear that all of the natural and cultural checks on population growth have suddenly been pushed aside by culture change, while tribal lands have been steadily reduced and consumption levels have risen. In many tribal areas, environmental deterioration due to overuse of resources has set in, and in other areas such deterioration is imminent as resources continue to dwindle relative to the expanding population and increased use. Of course, population expansion by tribal peoples may have positive political

consequences, because where tribals can retain or regain their status as local majorities they may be in a more favorable position to defend their resources against intruders.

Swidden systems and pastoralism, both highly successful economic systems under traditional conditions, have proved particularly vulnerable to increased population pressures and outside efforts to raise productivity beyond its natural limits. Research in Amazonia demonstrates that population pressures and related resource depletion can be created indirectly by official policies that restrict swidden peoples to smaller territories. Resource depletion itself can then become a powerful means of forcing tribal people into participating in the world-market economy—thus leading to further resource depletion. For example, Bodley and Benson (1979) showed how the Shipibo Indians in Peru were forced to further deplete their forest resources by cash cropping in the forest area to replace the resources that had been destroyed earlier by the intensive cash cropping necessitated by the narrow confines of their reserve. In this case, certain species of palm trees that had provided critical housing materials were destroyed by forest clearing and had to be replaced by costly purchased materials. Research by Gross (1979) and other showed similar processes at work among four tribal groups in central Brazil and demonstrated that the degree of market involvement increases directly with increases in resource depletion.

The settling of nomadic herders and the removal of prior controls on herd size have often led to serious overgrazing and erosion problems where these had not previously occurred. There are indications that the desertification problem in the Sahel region of Africa was aggravated by programs designed to settle nomads. The first sign of imbalance in a swidden system appears when the planting cycles are shortened to the point that garden plots are reused before sufficient forest regrowth can occur. If reclearing and planting continue in the same area, the natural patterns of forest succession may be disturbed irreversibly and the soil can be impaired permanently. An extensive tract of tropical rainforest in the

lower Amazon of Brazil was reduced to a semiarid desert in just fifty years through such a process (Ackermann, 1964). The soils in the Azande area are also now seriously threatened with laterization and other problems as a result of the government-promoted cotton development scheme (McNeil, 1972).

The dangers of overdevelopment and the vulnerability of local resource systems have long been recognized by both anthropologists and tribal peoples themselves. But the pressures for change have been overwhelming. In 1948 the Maya villagers of Chan Kom complained to Redfield (1962) about the shortening of their swidden cycles, which they correctly attributed to increasing population pressures. Redfield told them, however, that they had no choice but to go “forward with technology” (Redfield, 1962: 178). In Assam, swidden cycles were shortened from an average of twelve years to only two or three within just twenty years, and anthropologists warned that the limits of swiddening would soon be reached (Burling, 1963: 311–312). In the Pacific, anthropologists warned of population pressures on limited resources as early as the 1930s (Keesing, 1941: 64–65). These warnings seemed fully justified, considering the fact that the crowded Tikopians were prompted by population pressures on their tiny island to suggest that infanticide be legalized. The warnings have been dramatically reinforced since then by the doubling of Micronesia’s population in just the fourteen years between 1958 and 1972, from 70,600 to 114,645, while consumption levels have soared. By 1985 Micronesia’s population had reached 162,321.

The environmental hazards of economic development and rapid population growth have become generally recognized only since worldwide concerns over environmental issues began in the early 1970s. Unfortunately, there is as yet little indication that the leaders of the new developing nations are sufficiently concerned with environmental limitations. On the contrary, governments are forcing tribal peoples into a self-reinforcing spiral of population growth and intensified resource exploitation, which may be stopped only by environmental

disaster or the total impoverishment of the tribals.

The reality of ecocide certainly focuses attention on the fundamental contrasts between tribal and industrial systems in their use of natural resources, who controls them, and how they are managed. Tribal peoples are victimized because they control resources that outsiders demand. The resources exist because tribals managed them conservatively. However, as with the issue of the health consequences of detribalization, some anthropologists minimize the adaptive achievements of tribal groups and seem unwilling to concede that ecocide might be a consequence of cultural change. Critics attack an exaggerated “noble savage” image of tribals living in perfect harmony with nature and having no visible impact on their surroundings. They then show that tribals do in fact modify the environment, and they conclude that there is no significant difference between how tribals and industrial societies treat their environments. For example, Charles Wagley declared that Brazilian Indians such as the Tapirape

*are not “natural men.” They have human vices just as we do.... They do not live “in tune” with nature any more than I do; in fact, they can often be as destructive of their environment, within their limitations, as some civilized men. The Tapirape are not innocent or childlike in any way.*

Wagley, 1977: 302

Anthropologist Terry Rambo demonstrated that the Semang of the Malaysian rain forests have a measurable impact on their environment. In his monograph *Primitive Polluters*, Rambo (1985) reported that the Semang live in smoke-filled houses. They sneeze and spread germs, breathe, and thus emit carbon dioxide. They clear small gardens, contributing “particulate matter” to the air and disturbing the local climate because cleared areas proved measurably warmer and drier than the shady forest. Rambo concluded that his research “demonstrates the essential functional similarity of the environmental interactions of primitive and civilized societies” (1985:

78) in contrast to a “noble savage” view (Bodley, 1983) which, according to Rambo (1985: 2), mistakenly “claims that traditional peoples almost always live in essential harmony with their environment.”

This is surely a false issue. To stress, as I do, that tribals tend to manage their resources for sustained yield within relatively self-sufficient subsistence economies is not to make them either innocent children or natural men. Nor is it to deny that tribals “disrupt” their environment and may never be in absolute “balance” with nature.

The ecocide issue is perhaps most dramatically illustrated by two sets of satellite photos taken over the Brazilian rain forests of Rondonia (Allard & McIntyre, 1988: 780–781). Photos taken in 1973, when Rondonia was still a tribal domain, show virtually unbroken rain forest. The 1987 satellite photos, taken after just fifteen years of highway construction and “development” by outsiders, show more than 20 percent of the forest destroyed. The surviving Indians were being concentrated by FUNAI (Brazil’s national Indian foundation) into what would soon become mere islands of forest in a ravaged landscape. It is irrelevant to quibble about whether tribals are noble, childlike, or innocent, or about the precise meaning of balance with nature, carrying capacity, or adaptation, to recognize that for the past 200 years rapid environmental deterioration on an unprecedented global scale has followed the wresting of control of vast areas of the world from tribal groups by resource-hungry industrial societies.

## DEPRIVATION AND DISCRIMINATION

*Contact with European culture has given them a knowledge of great wealth, opportunity and privilege, but only very limited avenues by which to acquire these things.*

Crocombe, 1968

Unwittingly, tribal peoples have had the burden of perpetual relative deprivation thrust upon them by acceptance—either by themselves or by the governments administering them—of the standards of

socioeconomic progress set for them by industrial civilizations. By comparison with the material wealth of industrial societies, tribal societies become, by definition, impoverished. They are then forced to transform their cultures and work to achieve what many economists now acknowledge to be unattainable goals. Even though in many cases the modest GNP goals set by development planners for the developing nations during the “development decade” of the 1960s were often met, the results were hardly noticeable for most of the tribal people involved. Population growth, environmental limitations, inequitable distribution of wealth, and the continued rapid growth of the industrialized nations have all meant that both the absolute and the relative gap between the rich and poor in the world is steadily widening. The prospect that tribal peoples will actually be able to attain the levels of resource consumption to which they are being encouraged to aspire is remote indeed except for those few groups who have retained effective control over strategic mineral resources.

Tribal peoples feel deprivation not only when the economic goals they have been encouraged to seek fail to materialize, but also when they discover that they are powerless, second-class citizens who are discriminated against and exploited by the dominant society. At the same time, they are denied the satisfactions of their traditional cultures, because these have been sacrificed in the process of modernization. Under the impact of major economic change family life is disrupted, traditional social controls are often lost, and many indicators of social anomie such as alcoholism, crime, delinquency, suicide, emotional disorders, and despair may increase. The inevitable frustration resulting from this continual deprivation finds expression in the cargo cults, revitalization movements, and a variety of other political and religious movements that have been widespread among tribal peoples following their disruption by industrial civilization.

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