

Chapter 1

Introduction

This book presents the results of research in an indigenous community of Central Brazil. Our principal aim, in collecting and analyzing demographic, biological, epidemiological, and ecological data, has been to produce a diachronic view of the long and complex interaction between the Xavánte people, especially those of the Etéñitépa community, and the surrounding Brazilian national society. On a broader scale, our research may be seen as an attempt to understand how local systems interact with larger social, economic, and political institutions and processes.

Although the most recent contact, which must now be considered permanent, between the Xavánte and the national society began only fifty years ago, in the 1940s, historical sources show that they have been resisting Western expansion for centuries. Accounts of the Xavánte in the eighteenth and nineteenth centuries refer to epidemics, armed conflicts, and attempts of the Portuguese colonial government to “pacify” and settle them. The Xavánte responded to successive fronts of European penetration with increased mobility and eventually escape through westward migration. In the mid-twentieth century they were again overtaken, as the Brazilian government implemented the “March to the West,” opening Central Brazil to colonization and economic development. We argue, therefore, that there is no way to regard the Xavánte as a society until recently isolated from the political and economic processes that have been taking place for centuries in Brazil and beyond.

The consequences of European expansionism for native societies of the Americas over the last five centuries are well documented. As the New World was conquered, they suffered from epidemic disease, forced labor, violent death, and finally extinction or marginalization. The fate of indigenous peoples in Brazil has been no different. While the exact magnitude of the demographic reduction of native populations in Brazil over the last five centuries may still be debated, there is little doubt that it was catastrophic.

In our case study of the Etéñitépa Xavánte, we document some of

the biological, epidemiological, and ecological consequences of contact with the Brazilian national society in the second half of the twentieth century. However, our intention is to reach beyond merely documenting effects to show the importance of particular circumstances. We argue that extrinsic events and situations, as well as ecological, social, and biological characteristics intrinsic to Xavánte society, have played important roles in shaping their contact and postcontact experience. Social transformations imprint “signatures,” or biological marks, upon individuals in a population, and one of the intents of our study is to highlight some of these.¹

Moreover, there can hardly be any region of the world today where a small-scale or indigenous society may continue to enjoy true political and economic autonomy. In most cases such societies subsist as subordinated and impoverished segments of the national society. We believe that our documentation of the Xavánte experience has broad significance, exemplifying the process through which small-scale societies become disadvantaged populations without access to services and benefits available to other social segments.

At present, some two hundred indigenous societies, with a total population of nearly 280,000, survive in Brazil. This corresponds to less than 0.5 percent of the total Brazilian population. Most are settled on reservations² and interact at different levels of intensity with the Brazilian national society. They range from a few still relatively isolated groups in the Amazon to many that are deeply involved in regional markets and a growing number that live on the outskirts of Brazilian cities. A common denominator that unites them is their marginalization within Brazilian society, reflected in poor health and economic conditions and the difficulty they experience to obtain access to health care, education, and other social services. While some groups still remain at risk for epidemic diseases capable of decimating their populations, others are experiencing high rates of population growth even while they face the simultaneous presence of both infectious and chronic noncontagious diseases. The prevalence of accidental injuries, violence, and social suffering (alcoholism, suicide, and so on) also varies widely from group to group. What can be generally stated, however, is that for the great majority of indigenous peoples in Brazil morbidity and mortality rates are unequivocally higher than overall national rates, while life expectancy at birth is disturbingly low.

There is relatively little reliable information about the health and

demography of indigenous peoples in Brazil. Even less is known about how these dimensions are changing as Indian societies increasingly interact with wider systems. It is important to recognize that these experiences may lead to health/disease profiles radically different from that of the Brazilian national society, which over recent decades has undergone major demographic and epidemiological transitions. Knowledge about the differences is highly relevant to the planning, implementation, and evaluation of public services for indigenous peoples. In this case study of the Etéñitépa Xavánte, we document the changing state of demography, ecology, and health/disease of a contemporary Indian society in Brazil. We also point to their efforts to cope with these rapidly changing conditions. Our hope is that the knowledge gained may help to provide a firmer base for decision making and action affecting them as well as other indigenous peoples. We believe that, while some aspects of our research apply more directly to the Xavánte, much of it, at a higher level of generality, is relevant to the situation of other small-scale societies, whether characterized as “indigenous” or not.

Human Biological and Epidemiological Research in Amazonia

Knowledge about many aspects of the biology and epidemiology of indigenous Amazonian peoples in Brazil has been accumulating since the 1960s. Research has been most intense in the areas of population genetics and epidemiology/tropical medicine. This research was spearheaded by a relatively small group of investigators. Among the most influential have been James V. Neel and Francisco M. Salzano in the field of population genetics and Francis L. Black and Roberto G. Baruzzi in research related to the epidemiology of infectious and parasitic diseases.

Research in population genetics has focused primarily on the mechanisms involved in the production and maintenance of genetic variability. The general orientation of this research agenda was made explicit by Neel.

The general thesis behind the program was that, on the assumption that these people represented the best approximation available to the conditions under which human variability arose, a systems type of analysis oriented toward a number of specific questions might

provide valuable insights into problems of human evolution and variability. We recognize, of course, that the groups under study depart in many ways from the strict hunter-gatherer way of life that obtained during much of human evolution. . . . We assume that the groups under study are certainly much closer in breeding structure to hunter-gatherers than to modern man; thus they permit cautious inferences about human breeding structure prior to large-scale and complex agriculture. (1970, 815)³

This research program in population genetics was not oriented by a search for genetic adaptation per se, in the sense of reproductive advantage in particular environmental circumstances. Instead, the focus was on population structure and the application of methodologically sophisticated biometric analyses to genetic processes at the microevolutionary level. The data collected included medical examinations, anthropometric and dental measurements, vital statistics (mortality, fertility and migration), and blood genetic typing. These studies have proved to be important in revealing how random processes (e.g., genetic drift and founder effects) result in high levels of interpopulation genetic variability. The major human biology projects were carried out among the Xavánte, Makiritáre, Yanomámi, and Kayapó (Neel 1994; Salzano and Callegari-Jacques 1988).

In a work entitled “A prospectus for genetic studies on the American Indians,” published in 1967, Neel and Salzano set down three specific themes that should receive particular attention in this research program: (1) questions related to the early peopling of the Americas, (2) questions related to the microevolutionary dynamics of these populations from which models might be formulated that would help in understanding human evolutionary history, and (3) questions about the emergence of noninfectious diseases and “genetic adjustments” deriving from contact of these populations with Western society (Neel 1968; Neel and Salzano 1967a, 246–57; Neel et al. 1977; Salzano 1991). Of these topics, the first two received the most attention in the investigations of the 1960s and 1970s.

A good example of theory building resulting from these Amerindian studies is the “fission-fusion model,” which was first proposed by James Neel and Francisco Salzano based on observations made among the Xavánte and further developed through the Yanomámi studies (Neel and Salzano 1967a; Smouse et al. 1981; Thompson 1979). This model,

which was originally formulated to explain the large differences that were sometimes observed in gene frequencies among South American Indian villages, even when located close to one other, was later expanded to elucidate patterns of genetic microdifferentiation and population structure in small-scale human populations in general. Neel et al. (1977, 121) summarize in general terms the model and its implications.

New villages (populations) do not arise by some random sampling of a large “parental” gene pool, but by a fissioning of a pre-existing village, usually to some extent along lineal lines. . . . This is because village alliances (and so migration matrices) are subject to sudden changes and because the dictates of war and disease also result in village fusions, which probably occur with sufficient frequency to equal in importance small-scale intervillage migrations. . . . Social structure thus sets the stage for isolated demes with unusual combinations of gene frequencies and this may play a role in the rapid evolution which seems to have characterized our species.

Given these motives for the research programs in human biology, it is not surprising that emphasis fell on the study of populations considered to be relatively isolated or little affected by external historical and political processes. The predominant view when the program began was that the expansion of economic and demographic frontiers was occurring at such a rapid pace that conditions suitable for studying native peoples in a “relatively undisturbed condition” were vanishing.⁴ It is important to emphasize, however, that the researchers were aware of the extent of the impacts of Western expansion on New World populations. For example, in 1967 Neel and Salzano wrote that “there is no Indian group completely untouched by the discovery of America and subsequent contacts, direct or indirect, with the Western World”; moreover, “we have no way of knowing with certainty to what extent the surviving groups of . . . Indians have had their way of life seriously disrupted by the events of the past 450 years” (1967b, 246, 248). Referring to his attempts to use data from indigenous groups in order to gain insights into broader processes related to human biological diversity, Neel drew on the metaphor of a “mirror cracked and dusty, but as accurate as any we have” (1994, 139).

These investigations in human biology carried out in Amazonia, while incorporating “history,” envisioned history on a macroevolutionary

scale. Their aim was to explain the biological trajectory of humans over long periods of time. Within this line of research, it was thought appropriate to use biological data collected from populations relatively unaffected by “modern” living conditions to generate analytical models for human biological evolution. For indigenous groups to be used as models, producing results that could be generalized beyond the regional scale, it was considered important to assure that they were influenced as little as possible by local historical, political, and economic processes. In order to guarantee the validity of conclusions on a macrohistorical scale, it was necessary to control (in the sense of excluding) microhistorical dynamics related to the interaction of the native groups with the surrounding national societies.

Another area of research in human biology in Amazonia that received considerable emphasis was the epidemiology of infectious disease. We can identify two main lines of investigation.

The first line was particularly associated with work in human genetics, where research on infectious diseases was primarily aimed at characterizing the “disease pressures” to which indigenous populations were submitted. In these populations, infectious diseases were the most important causes of death. Researchers were also interested in finding out which infectious diseases affected native Amazonian populations before Europeans reached the Americas (Black et al. 1974; Neel 1968, 1977, 1982a; Neel and Salzano 1967b).

The second line of investigation in Amazonian epidemiology was related to the broad interests of worldwide biomedical research in the 1960s. Through research on populations held to be “isolated,” epidemiologists were attempting to understand the relationships between population size and the persistence of certain contagious diseases. More specifically, discussions turned on the concept of the “critical population size” necessary to maintain at endemic levels viral infections that confer lasting immunity, such as measles and smallpox (Black 1966, 1975, 1990).

Perhaps it was in the study of the dynamics of infectious disease that research in human biology in Amazonia came closest to considering the processes of interaction between indigenous populations and the surrounding national society. In any case, these studies placed their emphasis on the first moments of contact.

The high mortality observed during outbreaks of viral diseases, especially measles epidemics, led to heated discussions about the relative weight of biological/immunological determinants versus sociocultural fac-

tors (Coimbra 1987; Neel 1974). One hypothesis was that the population collapse following epidemics resulted from genetically based susceptibilities to novel pathogens (Black 1990, 1992; Black et al. 1982). According to this explanation it is not that native peoples have “inappropriate” genes to cope with diseases, but rather that their greater genetic homogeneity may lead to relatively restricted diversity of immune reaction and therefore to impaired survival potential. Other explanations emphasized the impacts of socioeconomic and ecological breakdowns experienced by indigenous people hit by epidemics and attributed high mortality largely to these effects (Neel 1977, 1982a; Neel et al. 1970).

These lines of epidemiological research involved questions associated with central discussions in the field of human biology, like the early peopling of the Americas and the origins of diseases in the New World, the demographic dynamics and population size of indigenous peoples, and parasite loads and disease pressures as they relate to genetic processes.

It is important to mention another line of biomedical research that was consolidated during the 1970s and 1980s. This research focused on the clinical description and epidemiological analysis of so-called tropical diseases with little-known etiologies and unclear transmission cycles. Roberto Baruzzi, his students, and his associates made a number of these studies among Upper Xingu indigenous populations. An example is their study of the epidemiology of toxoplasmosis (Baruzzi 1970). At the end of the 1960s little was known about the modes of transmission and geographical distribution of this cosmopolitan parasitic disease, which is caused by the protozoan *Toxoplasma gondii*. Another concern of tropical medicine that led to studies in indigenous populations at this time was the “syndrome of tropical splenomegaly” and its association with endemic malaria (Baruzzi et al. 1976). There was also interest in studying certain infectious diseases considered to be rare or exotic, such as lobomycosis and mansoniellosis (Baruzzi et al. 1973, 1979). At the same time, and over many years, Baruzzi and his associates provided health care to the Indian groups living in the Xingu Park (Baruzzi et al. 1978).

Some of the genetic and epidemiological studies on native Amazonian populations have reached a remarkable degree of methodological and theoretical sophistication. On the basis of specific case studies, researchers have been able to generate important theoretical formulations in human population genetics and health/disease processes related to infectious diseases. While there have been discussions on the

epidemiological aspects of the interaction between indigenous peoples and national societies, the main focus has been upon recently contacted and/or semi-isolated populations, and, although the importance of a research agenda that includes the study of change has been stressed (see Neel 1991; Salzano 1985, 1991), relatively little attention has been given to this topic. The theme in itself—the increasing connectedness of indigenous societies in Brazil to regional and macroregional economic and political networks—has yet to become an autonomous and productive domain of knowledge in the areas of biological anthropology and the epidemiology of indigenous peoples in Brazil.⁵ We feel that it is crucial to increase this knowledge as indigenous peoples struggle to overcome their marginalization within the national society and to widen their opportunities and choices. The primary focus of our study, therefore, is not on the interaction of the Xavánte population with its “natural environment,” important as this is, nor on the biological impact of contact as an event, but on the Xavánte as a society in transition, with emphasis on the demographic, ecological, and epidemiological effects of ongoing change.

Survival, Permanence, and Changing Research Agendas

The experience of indigenous peoples in Brazil that came into contact with the national society during the first half of the twentieth century led to pessimistic forecasts about their ultimate chances for survival, with special fear for groups that were still “isolated.” Toward the middle of the century Brazilian anthropologist Darcy Ribeiro (1956) analyzed a large body of ethnographic information and demographic data that demonstrated the magnitude of the depopulation affecting indigenous peoples, largely due to epidemics of infectious diseases. According to Ribeiro (3), “the history of relations between Indians and whites in Brazil teaches that the weapons of conquest were . . . bacteria and viruses, especially viruses.” Ribeiro (1977, 239) pointed out that of the 230 Indian groups known in Brazil in 1900, 87 were extinct by 1957. When only groups defined as “isolated” in 1900 were considered, the percentage of population loss in such groups between that date and 1957 was estimated to be around 73 percent, showing the dimensions of extermination to be even more appalling (434–35). However, Ribeiro did not foresee the physical extinction of all groups, and he thought that “those that survived [would remain] Indian—no longer in their habits and customs but in their self-

identification as people different from the Brazilians and as victims of their domination” (8).

Around the middle of the 1960s the military government of Brazil initiated a series of development projects in the Amazon. This period was characterized by huge economic enterprises and infrastructure development programs that involved the construction of highways and hydroelectric dams, mining projects, and agricultural settlements, all of which stimulated migration into the Amazon (Barbira-Scazzocchio 1980; Cleary 1990; Hemming 1985; Moran 1981; Schmink and Wood 1984; Smith 1981; Velho 1981). The repercussions for a great number of native peoples, many of them still living in relative isolation, were disastrous epidemics, social breakdown, and in some cases physical extinction (Davis 1977; Ramos 1984; Santos and Coimbra 1998).

In various areas of Amazonian anthropology, the combined threat of the disappearance of indigenous peoples and the accelerated rate of environmental destruction seems to have stimulated—as we have seen in the case of human biology—lines of research that focused on indigenous societies as yet little affected by the social and economic impacts of Western expansion. About the field of ecological anthropology Hames and Vickers (1983, 26) wrote, “As scientists, we also recognize that tropical environments everywhere are now experiencing rapid change due to deforestation and the impact of development. . . . This knowledge gives our research a sense of urgency and a concern that scientific findings be incorporated into the ongoing process of policy formulation and planning for these regions.” In ethnology as well there was a sense of urgency: “Reviewing the recent literature [on lowland South American ethnography] brings into focus the enormous amount remaining to be done, and shows how rapidly opportunities for future work are being eliminated by the far-reaching effects of ‘progress’ and ‘development’ on all fronts, although seemingly most seriously in Brazil” (Jackson 1975, 330–31). This pessimism seems to have been pervasive among anthropologists studying indigenous societies at the time. Wright (1988, 371) writes that “between 1952 and 1968 there rose in the international academic community a plea for ‘urgent’ anthropological studies to be done among tribal societies because they were considered to be in the process of ‘disappearing.’ Hence, anthropologists felt the need to “save” aboriginal cultures in the face of what was called the ‘tragedy of anthropology.’”

By the end of the 1960s the accumulating evidence that the survival

of indigenous peoples in Brazil was threatened became known far beyond the country's borders. The international press used terms like *genocide* and *ethnocide* to describe what was happening (Davis 1977, 11–12, 74). Several international human rights organizations sent “fact-finding missions” to Brazil to ascertain whether these accusations were justified. The decade of the 1970s saw the growth of indigenous advocacy organizations throughout the world. At this time a number of groups also formed in Brazil for the defense of Indian rights, often criticizing prevailing models of “development,” which seemed to result, for affected populations, only in increased poverty and inequality as well as environmental destruction (Ramos 1998; Wright 1988). By the 1980s, as news of widespread deforestation in the Amazon spread in North American and European countries, many human rights organizations added environmental protection to their agendas, thus strengthening their public appeal (Conklin and Graham 1995).

The development programs launched in Amazonia brought major social and demographic consequences for indigenous peoples. However, the more pessimistic forecasts of population extinction were not confirmed. By the 1980s the demographic future of Brazilian Indians already looked brighter. According to anthropologist Mércio Gomes,

What comes out as most surprising and extraordinary in relations between Indians and Brazil is the possible historic turnaround in indigenous demography. It would certainly be bold to affirm that the Indians, at last, have survived, and that this is a concrete and permanent reality. . . . But the fact is that there are strong indications that the surviving Indian populations have been growing in the last three decades, confounding the alarming prognostications . . . of a short while ago. (1988, 16–17)

By the 1990s perceptions about the future of Indians had changed. In Ricardo's words, “the hypothesis of the physical disappearance of Indians in Brazil is gone, and therefore we are not facing a ‘lost cause,’ as was sometimes said a few years ago” (1996, xii). This reversal of the pessimistic picture of the future of indigenous peoples was based on the realization that many populations had been growing continuously for quite a long period of time.

Also, indigenous peoples in Brazil were increasingly making their voices heard. In part through their experience with support groups, the

Indians learned of the power of the “indigenous image.” The Xavánte wore paint and carried bows and arrows when they appeared at government agencies in Brasília, winning media attention for their struggle to reclaim their land base. After democracy returned to Brazil, a new constitution, promulgated in 1988, “revolutionized relations between the state and indigenous peoples and terminated five centuries of integrationist policy. . . . It increased enormously the rights of the Indians, recognizing their social organization, their practices, religions, languages, and beliefs. Above all, it called the Indians ‘Indians’ and gave them the right to continue as such” (Souza 1994, 218–19). This constitution also gave the Indians broader rights to organize themselves. A number of Indian organizations and support groups were founded at this time (Ramos 1998, 259–60; Souza 1994). As Urban (1985) points out, the number of distinct indigenous societies in Brazil, formerly politically autonomous, brought into contact with national society at different times and under different circumstances makes it difficult to define common goals. Nevertheless, Brazilian Indian leaders consistently define self-determination to include control over their lands’ natural resources and the right to use them as they see fit. This may not always be in accordance with the ideal of resource sustainability upheld by their environmentalist supporters (Conklin and Graham 1995, 705).

Eduardo Viveiros de Castro argues that the newfound demographic and sociocultural permanence of indigenous peoples obliges Amazonian anthropologists to give some deep thought to their analytical tools as well as their research topics. According to him, the result of the new situation is a (welcome) blurring of the division of labor between those specializing in so-called “pure” societies and those studying “acculturated” societies. Ethnographic examples show that the trajectory of indigenous peoples in contact is not necessarily from “adaptive integrity” to a future characterized by social breakdown and anomie. Nor are their paths to that future inevitably those laid down by the heavy hand of Western expansionism. Castro calls attention to the need to recognize “the historical agency of native peoples” (1996, 192).

In the 1990s, an emphasis on history, justified by the requirement to better understand the diachronic dimensions of interaction between indigenous peoples and national sociopolitical systems, has become central to anthropological discourse about Amazonian peoples.⁶ Recent edited volumes on Amazonia and indigenous peoples in Brazil, covering the various subfields of anthropology, agree in stressing the historical

perspective.⁷ Anna Roosevelt (1994, 11) calls for greater emphasis on postcontact history.

Traditional ethnographies customarily explain the present configurations and adaptations of Amazonian Indians without reference to the many marked changes that have taken place in indigenous lifeways and their political, economic, and social context in the last 500 years. . . . In order to gain a clearer understanding of the reasons for the patterns of native lifeways in specific regions today, it is important to evaluate the specific impact of the European conquest.

Manuela Carneiro da Cunha (1992a, 22) argues that rethinking the history of indigenous people has the potential to help us reflect on the position of these societies in the national context and more widely on the future of interethnic relations in Brazil.

During nearly five centuries the Indians were thought of as ephemeral beings in transition, transition to Christianity, to civilization, to assimilation, to disappearance. Today, we know that indigenous societies are part of our future and not only of our past. Our common history . . . was a rosary of iniquities committed against them. We can only hope that the relations established from now on will be more just, and perhaps the sixth centenary of the discovery of America will be something to celebrate.

About the Book

We see this book as a case study that may help us to better understand not only the situation of Indians in Brazil but also that of indigenous and other marginalized peoples encapsulated in national societies in many other parts of the world. Although Western expansionism and colonialism have taken on different tonalities under different historical, political, and economic circumstances, the end result has usually been that indigenous societies have fallen to the lowest rung of the social ladder. Toward the end of the book, when we explore the biological and health transitions that the Xavánte are undergoing, the parallels between our case study and the situation of indigenous peoples in other parts of the world will become evident.

There are two rather unusual things about this book: one is the

long time period over which the field data on the Etéñitépa Xavánte that we have analyzed and compared in the book were collected, and the other is the book's interdisciplinary breadth. David Maybury-Lewis, in 1957 to 1958, carried out the first anthropological study of the group, resulting in a book, *Akwẽ-Shavante Society* (1967), on their social structure. One of the authors of the present book (Salzano) took part, with James Neel, in the extensive study, carried out in 1962, of the human biology and genetics of the Etéñitépa group. Another author (Flowers) did research in 1976–77 covering the human ecology and demography of the same group. In the 1980s an anthropological linguist, Laura Graham, studied aspects of Xavánte oratory and leadership. The most recent field studies, by Coimbra, Santos, Flowers, and their students, were made over five years, from 1990 to 1995. Although the village site had changed, the community that we saw in the 1990s was largely made up of the descendents of the 1960s population and even included a number of individuals seen in the 1960s. Chapters were not written by the authors separately; all authors worked (with many heated but friendly arguments) on the writing of each chapter. The expertise of each author contributed to the whole book.

In chapter 2 we introduce the geographical area where the Xavánte live, describing the climate, vegetation, soils, and fauna of the *cerrado* region of Central Brazil. Xavánte reservations are located along with population numbers and transportation links to regional urban centers. The chapter goes on to place the Xavánte as a Jê linguistic group and then describes some aspects of Xavánte social structure, including the age set system and the exogamous moieties that regulate marriage. A description of the site and physical layout of Etéñitépa village follows.

Chapter 3 describes the history of the interactions of the Xavánte with the Brazilian national society over a period of nearly three centuries. In the early eighteenth century the Xavánte clashed with gold seekers in colonial Goiás. We describe how the Indians raided mining towns and how the colonial governors eventually made peace with some Xavánte and settled them in secular mission villages. Nineteenth-century accounts tell how the Xavánte abandoned the settlements and migrated west across the Araguaia River, where they maintained their isolation and hostility until the middle of the twentieth century, when they again came into contact with the national society. From this time on we can follow the particular history of the Etéñitépa group over a number of village splits and moves. In recent times the Etéñitépa

Xavánte have struggled to include more of their former territory in their reservation and have been involved in the rise and fall of a government project to mechanize rice growing on their reservation. While maintaining many traditional values, the Etéñitépa Xavánte are forming an increasing number of political, economic, and cultural links to outsiders. The history of the Xavánte shows that, although the intensity of the interaction has varied, their society has been connected to the world system for centuries, deeply affecting its internal functioning and structural relations.

In chapter 4 we review genetic information concerning the Xavánte. We compare data from the Xavánte at the morphological and biochemical levels with similar data from other South American groups. We refer to data derived from research conducted at Etéñitépa in the 1990s as well as that obtained in previous research on the Xavánte. Our analysis indicates that no significant changes in the gene pool of the Etéñitépa Xavánte have occurred in the last thirty years.

In chapter 5 we describe the demographic dynamics of the Etéñitépa Xavánte from the time of contact in 1946 to the present, based on data collected in 1957–58, 1962, 1976–77, and 1990. We point out some of the methodological difficulties of doing demographic analyses of indigenous groups in Brazil because of the absence of a system for collecting vital statistics on a regular basis. Data from censuses collected in the Etéñitépa Xavánte population show that, after a period following contact when the population declined due to epidemic disease and social disruption, it has been increasing up to the present. Based on the reproductive histories of women, we show that during the 1960s fertility dropped and childhood mortality rose sharply. While infant mortality began to decline in the 1970s, it is still very high relative to national rates. In the last part of the chapter we describe how adult mortality after contact was due not to disease alone but also to violence provoked by accusations of sorcery that fell harder on the weaker faction, and we show the resulting effects on marriage patterns a generation later. An important point in this chapter is the interplay between aspects of Xavánte social organization and the impacts of the depopulation that followed contact.

Chapter 6 begins by showing how the Xavánte have traditionally made their living in the *cerrado* regions of Central Brazil. They have learned to gain their subsistence from its resources by hunting, gathering plants for food and manufacture, fishing in the rivers and streams, and planting crops in the gallery forest. We describe recent changes in their

subsistence activities, in particular those deriving from the influence of government-sponsored development projects. During the late 1970s and early 1980s the Indian agency FUNAI implemented a project on the Xavánte reservations intended to make the Indians large-scale producers of rice for the regional market. We show how the program failed, and, comparing time allocation data from 1976–77 to data collected in 1994, we find that the Xavánte at present are pursuing a more “traditional” subsistence strategy. However, because of the need for resources from the outside even to practice “traditional” subsistence, the line between tradition and “modern” has become blurred. In recent decades much of the *cerrado* has been irrevocably changed by intensive agriculture; Pimentel Barbosa reservation is one of the largest areas of relatively nondegraded *cerrado* vegetation remaining in Brazil. The Etéñitépa Xavánte, with the assistance of environmentalist nongovernmental organizations (NGOs), are fighting to block a proposed inland waterway that would have a negative impact on the fish and other wild resources of the reservation. The Etéñitépa Xavánte have formed many links in recent years with outside organizations, most of which are NGOs concerned with environmental issues.

In chapter 7 we briefly examine the history of Indian health services in Brazil, pointing out that they have often been badly organized and inefficient. Our analysis shows that health care available for the Xavánte far from meets their needs. We describe recent structural changes in the national health system and discuss how these are affecting health services for indigenous peoples.

In chapter 8 we present epidemiological data for the Etéñitépa Xavánte in order to discuss their current health status. Because of the lack of reliable statistics on Indian health in Brazil, we rely for our analyses almost entirely on primary data collected by our research team. We describe the Etéñitépa village and its surroundings from a sanitary point of view. Data from local hospitals and clinics show high morbidity and death rates among young children, primarily from gastrointestinal and respiratory diseases. The epidemiological profile of the Xavánte is still dominated by infectious and parasitic diseases. We also present information on other diseases affecting Xavánte health, including intestinal parasites, malaria, and tuberculosis. We used anthropometry to evaluate the nutritional status of children, pointing out that growth deficits may often be due to a synergy between infection and malnutrition. High rates of anemia were found in young children and women of reproductive age.

Protein-energy malnutrition is present at Etéñitépa at rates similar to those found in the poorest regions of Brazil.

In chapter 9 we discuss the epidemiological transition that the Xavánte are experiencing. We begin by reviewing some of the major formulations of the theory of epidemiological transition. We argue that, although infectious and parasitic diseases are still the leading causes of sickness and death, it is clear that chronic noncontagious diseases, including hypertension and diabetes, are becoming increasingly important. Among the Xavánte, changes that have taken place in settlement, levels of physical activity, and dietary patterns, are affecting health conditions. We compare anthropometric and other health-related data collected in the 1990s to data collected in the 1960s. The trend has been toward changes in body composition (weight gain) and the emergence of hypertension. Although the Etéñitépa Xavánte clearly seem to be going through a health transition, the pace is slow compared to what is happening on other Xavánte reservations, where rates of obesity and diabetes are already alarming. These comparisons suggest that the different rates of transformation in health conditions that one observes in the various Xavánte reservations are related to political and economic aspects of their postcontact experience.

Finally, in chapter 10 we bring together the topics looked at in previous chapters to discuss whether the Xavánte case fits any of the theoretical frameworks of health transition that have been proposed to describe the experience of other societies. Our argument is based on the demographic, ecological, and health/disease data presented throughout the book. We conclude that the Xavánte transition has characteristics that differentiate it from previously formulated models. We stress the importance of recognizing diversity and paying attention to local contexts when talking about the current situation and patterns of transition that indigenous societies in Brazil are experiencing today.