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ETHNOBOTANY OF THE ESE EJA:

PLANTS, HEALTH, AND CHANGE IN AN AMAZONIAN SOCIETY

by

MIGUEL N. ALEXIADES

A dissertation submitted to the Graduate Faculty in Biology in partial fulfillment of the requirements for the degree of Doctor in Philosophy, The City University of New York.

1999

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This manuscript has been read and accepted for the Graduate Faculty in Biology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

ETHNOBOTANY OF THE ESE EJA: PLANTS, CHANGE, AND HEALTH IN AN AMAZONIAN SOCIETY

by

Miguel N. Alexiades

Advisor: Dr. Christine Padoch

This thesis examines the roles of plants in the context of Ese Eja health-related thought and behavior. The Ese Eja are a small indigenous group currently living in lowland tropical forest along a number of tributaries of the Madre de Dios and Beni rivers, in Peru and Bolivia respectively. Two aspects of Ese Eja ethnobotanical processes are highlighted and explored. First, the notion that plants simultaneously fulfil multiple roles: pharmacodynamic, medical, social, cultural and symbolic. These roles are frequently interrelated and, more importantly, subject to considerable degrees of spatial and temporal variability. All these aspects of ethnobotanical interactions reveal much about broader ecological and social processes.

Over 190 plant species and 50 animal species are used in a wide range of contexts, such as treatment of diverse ailments, manipulating social relations, improving hunting skills, promoting the development of healthy and strong

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infants, and controlling fertility. Distribution of responses in a broad ethnomedical survey indicate a high level of idiosyncratic variability, though much variation is also patterned according to such socio-cultural variables as age and gender.

Linguistic, ethnohistoric and ethnobotanical evidence suggest that medicinals have acquired a significantly more prominent role in Ese Eja ethnomedicine over the past fifty to one hundred years. About half of all native plant medicinals are explicitly identified by the Ese Eja as having been learnt through contact with non-Ese Eja, and an additional 17% of medicinals are exotic or recently introduced species. The evolutionary and ethnobotanical implications of these observations are assessed in the context of the history of contact and its effect on health conditions.

The projection of social identities on plants interjects an important symbolic component to human-plant interactions. The recent introduction of the hallucinogen *ayahuasca* into Ese Eja ethnomedicine coincides with the simultaneous decline in the practice of another form of shamanism, ***eyámikekwa***. Whereas both *ayahuasca* and ***eyámikekwa*** shamanism employ overlapping concepts and paradigms, they each emphasize different aspect of nature with regard to the diagnosis and treatment of diseases. As such, they appear to address to different aspects of Ese Eja ethnobotanical and social experience.

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Dedicated to the *etiikiana*, "los antiguos", and to the power that their words and memory evoke among the living. And to *Bia'naba*. May we all meet one day, in *kweyhana*. *Ese Eja kia bame nei nei*.

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Acknowldegments

"In this plate of food, I clearly see the suffering of the world".
Thich Nhat Hanh

The Ese Eja maintain that all that is ordinarily visible is but a manifestation of an invisible world. In the same way, this thesis is the physical embodiment of countless moments, peoples, places, thoughts and acts, woven together by an act of individual creative experience. Within this visible expression then, lie concealed the acts, thoughts and words of thousands of invisible others. While a few, those who have left tangible footprints of their own reflections behind, are cited in the text, most are not directly acknowledged. I am deeply grateful to all those who have helped or in any way been part of this long process. In particular, I am eternally indebted to the Ese Eja, who have shared and taught me so much more than I could possibly write in a thesis.

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PART I. INTRODUCTION

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Chapter 1.

Ese Eja Ethnobotany:

Examining Plants and Change in an Amazonian Society

Introduction

I first met the Ese Eja in 1985, when I traveled to Madre de Dios as a volunteer for a British conservation and eco-development organization, Bioresources Ltd., of the Earthlife Foundation. Bioresources was engaged in a number of, especially at the time, highly innovative initiatives, including buffer zone development and the integration of ethnobotanical knowledge in resource management and eco-development (Earthlife, 1986). My own responsibilities centered on the creation of a regional ethnobotanical computerized database, ultimately intended to be part of an international network of databases.

Between 1985 and 1987, I worked with "Ribereño", Ese Eja, as well as Amahuaca and Harakmbut communities in the region. The presence of Bioresources in the area gave an important momentum to a local indigenous health care project, AMETRA ("Aplicación de Medicina Tradicional"), which was

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subsequently incorporated into the regional indigenous federation, FENAMAD ("Federación Nativa del Rio Madre de Dios y Afluentes").

As a regional health project, AMETRA trained indigenous health workers from different communities on the combined use of herbal medicines and primary health care. It encouraged the exchange of ethnobotanical information, indigenous medical expertise and medicinal plants through a series of activities. These included community workshops attended by delegates from different communities and ethnic groups, follow-up visits by AMETRA personnel, and the construction of a health center in the Ese Eja community of Infierno (Alexiades and Lacaze, 1996). The ethnobotanical data gathered by me during this time was also diffused to communities through written materials, culminating in the publication of an indigenous health care manual for the region (Lacaze and Alexiades 1995). In addition to conducting ethnobotanical research I worked closely with AMETRA developing some of its programs and fund-raising.

These early experiences in Madre de Dios had a profound influence on me, both personally and academically. Among other things, they convinced me of the value and potential of applied and participatory models in ethnobotanical research. During the course of my own research and through my observations of AMETRA workshops, it became apparent that ethnobotanical knowledge was something which could be rapidly and effectively diffused incorporated by indigenous actors.

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In 1988 I returned to the Ese Eja community of Infierno in Madre de Dios for a year, this time to conduct a quantitative ethnobotanical inventory in a hectare plot of mature tropical forest (Alexiades, 1989). As a result of this research, and through my work with Amahuaca, Shipibo-Conibo, and Ese Eja informants I became formally interested in the question of variability and in the dialectic relationship between ethnobotanical experience and perception (Alexiades, 1990).

My early fieldwork experience among the Ese Eja and other inhabitants of Madre de Dios challenged some of my preconceived notions regarding the characteristics of indigenous knowledge. For one thing, my observations of ethnobotanical processes suggested a high degree of dynamism, fluidity and variability. This conflicted with widespread static and ahistorical representations of indigenous knowledge. Statements made to me by some Ese Eja, such as "our ancestors used no medicinal plants" were confusing and rather disappointing to an inexperienced ethnobotanist raised on the cliché of medicine men familiar with countless medicinal plants. More bewildering still, was the realization that it was those Ese Eja who had had more contact with the "outside"- "Ribereños" and de-tribalized indigenous peoples- that often possessed most medicinal plant knowledge. This contradicted my stereotyped expectations, suggesting that "acculturation" was a rather more complex

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process than merely the "loss of knowledge gathered over millennia", another ethnobotanical cliché.

In many ways, this thesis represents the logical continuation of these early experiences in the field. More than that however, it is also the product of an and an intense and ongoing foray into the diverse, and to a biologist quite challenging, landscape of cultural anthropology, and the very inspiring influences of historical ecology, ethnomedicine and tropical ecology.

Scope of the thesis

Broadly, this thesis examines the relationship between the Ese Eja[1], a group of Amazonian swidden horticulturists and hunter-gatherers, and their surrounding natural environment. Specifically, I am interested in tracing the material and symbolic roles of plants in their health-related perceptions and behavior, particularly in the context of ongoing cultural and ecological change. That is, in my effort to construct an ethnobotanical ethnography for the Ese Eja, I will view and describe human-plant interactions as dynamic processes, embedded in the fabric of social and ecological relations.

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1. Ese Eja, meaning "true people", is the self-denominated term for this ethnic group. This name has been transcribed in various ways by different authors, following different systems of phonetic transcription: Ece'je (Zeleny, 1976); Ese-Ejja (Shoemaker et al., 1975); Ese Ejja (Firestone, 1991; Shoemaker and Shoemaker, 1983); Ese ejja (Rivero, 1984); Esse Ejja (Prettol, 1986-1987); Ese Exa (e.g. Kimura, 1983); Ese' Eja (e.g. Rummenhoeller and Lazarte-Velarde, 1990), and others. I follow Chavarría's recommendation, not marking the glottal between "Ese" and "Eja" in the orthography, since the position of this glottal is

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Even before the Ese Eja developed intense and protracted contacts with missionaries and outsiders at the turn of the century, subsistence patterns had already undergone considerable changes. This is clearly evidenced for example, by their dependence on an introduced crop, the plantain, ***ejawi*** (*Musa x paradisiaca* L.). The transition toward sedentism and the development of closer ties with the market economy over the past 100 years have all had profound impact on Ese Eja internal organization, as well as social and ecological relations. Migration has entailed a net displacement down river, away from the headwaters of several tributaries of the Madre de Dios, to the lower floodplain areas. Such social roles as ***eyámikekwa*** and ***etii***, once prevalent, have either disappeared or are undergoing fundamental transformations.

Settlement patterns have also changed, as houses and villages are now occupied over longer periods, with a tendency for higher population densities and crowding around government schools and other centralized services. Subsistence practices have likewise shifted. A fairly mobile lifestyle, associated with hunting, gathering and plantain swidden agriculture has gradually given way to a more sedentary existence and growing dependence on agriculture, including rice agriculture, as well as on market-driven extractivist activities. My

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automatically established by a grammatical rule in the language (Chavarría, pers. comm., 1998). Hence, my use of the annotation 'Ese Eja.'

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thesis examines and interprets Ese Eja-plant interactions in the light of these broad changes.

There are two interrelated aspects to these dynamics. On the one hand, the way Ese Eja experience their surrounding environments is changing. As the needs of the Ese Eja change, in part due to the demands of a market economy, so do their activities and the characteristics of their interactions with their surrounding natural resources. I am interested in examining how the status of different plant species as pharmacological and symbolic 'resources' is changing as a result of these processes.

In addition, new plant resources have entered the Ese Eja ethnobotanical universe, not only because the Ese Eja have migrated to "new" ecological areas, but also because exotic species and new varieties have been introduced from other regions and continents. For the Ese Eja, historical change has thus implied both qualitative and quantitative changes in their interactions with the plant world.

As human needs and ethnobotanical behaviors change, so do the meanings projected on plants. Changes in ethnobotanical perceptions are further enhanced by increased access to the cultural knowledge of other indigenous groups, a process facilitated by contemporary social and political contexts. Culture change, in terms of ethnobotanical knowledge at least, may be more

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accurately described by the term "transformation" than simply "loss" or "erosion". While in some cases the resource status of a particular species is re-enforced, in others weakened and yet in others replaced all together.

For the Ese Eja, contact with outsiders, subsumed under the category of ***deja***, is associated with the intensification of human interactions with plants. This in turn has important repercussions in how plants and animals are represented in medical thought and language, particularly since native perceptions of "nature" reflect the structure of social and economic relations. There is an interaction between culture change, worldview, illness and medicine which, I suggest, presents a valuable context through which to understand ethnobotanical relations and perceptions.

Ethnobotany and science

Long before Harshberger (1895, cited in Ford, 1978:33) coined the term "ethnobotany", writers, historians, philosophers, travelers and naturalists had documented human uses of plants. In a sense then, the origins of ethnobotany can be traced to the first written Classical and pre-Classical texts and Codices documenting the extensive herbal pharmacopoeias of Asia, Africa, the Middle East, Greece and Meso-America (Balick and Cox, 1996; Davis, 1995). Interest in indigenous knowledge and in the value of plant resources grew concomitantly

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with the rise of mercantilism and the development of a global, colonial, economy (Brockway, 1979). The colonization of the Americas, as well as large parts of Asia and Africa led to an explosion of the botanical universe of European naturalists. The development of the binomial system of classification has been described as an attempt to deal in a practical and systematic way with the burgeoning diversity of plants in science at this time (Kastner, 1977).

The late 1800's and early 1900's saw a peak in botanical exploration, with the famous explorations of von Humboldt and Bonpland, Wallace and Spruce (Davis, 1995:42). This period also marked the earliest attempts at systematically recording the plant lores of individual ethnic groups in North America (e.g. Mooney, 1889; Stevenson, 1915). Anthropologists and botanists, both concerned with how humans interact with plants, began to develop divergent agendas. Whereas the former became primarily interested in the cognitive and symbolic implications of ethnobotanical knowledge, the latter continued to focus on utilitarian aspects of plant use for several more decades (Ford, 1978).

The work of Schultes and colleagues, most notably La Barre, (e.g. 1938), Furst (e.g. 1990), Holmsted (Schultes and Holmsted, 1968) and Reichel-Dolmatoff (1975) on plant hallucinogens, offered important insights into the religious aspects of plants in society. Moreover, these studies contributed to a relativist understanding of magic, witchcraft and shamanism.

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Although Frazer (1890) provided the first systematic analysis of magic, it was Malinowski's (1935) description of Trobriand magic, and Evans-Pritchard's (1937) study of Azande magic and witchcraft which established the conceptual ground on which subsequent anthropological approaches to the study of indigenous medical concepts were developed. Once believed to be irreconcilable with western rationalism and science, and derided by early anthropologists such as Kroeber as a characteristic of "retarded" cultures, Evans-Pritchard and others showed that magical ideas and practices were part of coherent and systematic systems of logic, used to make sense and deal with the misfortunes of sickness and death. Subsequent accounts of indigenous medical systems have highlighted the import of symbols and metaphors in healing (e.g. Harner, 1973; Brown, 1985), illustrating how broader social, psychological and political concerns are voiced and negotiated (Brown, 1988; Grottanelli, 1976). In my analysis, I use this perspective as a framework with which to interpret Ese Eja notions of the "supernatural". Indeed, I hope to show that Ese Eja representations of the invisible world reflect the structure of social and political relations of the visible world.

The relationship between illness and society has been approached by different paradigms and perspectives, each highlighting a different aspect of this complex question. Ecological approaches view illness in the context of human-environment interactions. Changes in settlement and resource utilization

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patterns associated with sedentism, are known to increase the prevalence and intensity of infectious agents and parasites, for example (McElroy and Townsend, 1996: 281ff). In chapters 9 and 11, I explore the possible role of such ecological processes in promoting the incorporation and use of medicinal substances among the Ese Eja.

Some medical anthropologists, (e.g. Hahn and Kleinman, 1984:312), have proposed a distinction between 'disease', as a biomedically identifiable disorder, and 'illness' as the subjective experience of disease. The subfield of ethnomedicine focuses on different aspects of the illness experience, including its classification, causation theories, and associated therapies. Here, the focus is on the "native's point of view" and on the use of native categories as the basis for theoretical analysis. In chapters 6 and 7, I use a similar approach to discuss the categories used by the Ese Eja to classify, explain and respond to illness. My subsequent interpretation of the broader significance of these categories may however depart from native viewpoints.

Conklin's (1954) seminal study of the ethnotaxonomy of the Philippine Hanunóo was one the first systematic investigations of a tropical culture's interaction with its plant environment. His study marked the beginning of the powerful influence of ethnoscience in ethnobotany, an influence that remains tangible to this day.

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Ethnoscience, a postwar development within cultural anthropology, advocates the description of a culture through the comprehensive analysis of indigenous systems of categorizing experience; that is, from "the native's viewpoint". In practice, ethnoscience is largely defined by its methodology, which emphasizes the utilization of culturally meaningful questions (questions framed as a native would) in order to understand the system of underlying rules and hierarchies used by a culture to structure experience (Tyler 1969). It is the search for rigorous and formal methods by which the native's point of view can be transcribed that distinguishes ethnoscience from other approaches in cultural analysis, which also seek to understand the "native's viewpoint". Furthermore, ethnoscience deals primarily with cultural knowledge rather than behavior, though observation of cultural behavior is often used in order to generate further questions about informant knowledge (Werner and Fenton 1973).

The ethnoscience approach, with its emphasis on the use of emic[2] categories, has been subsequently successfully applied to the study of classification, knowledge, use and management of species and environments (e.g. Behrens 1989; Berlin et al. 1973; Johnson 1974), though strict application of its formal methodology is more associated with cognitive than economic ethnobotany (Berlin, 1992:4).

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2. The terms emic and etic were originally coined by Kenneth Pike in 1954, as an analogy to the phonemic (the set of sound contrasts significant to speakers of any given language) and phonetic (the scientific description of such sound patterns, which are applicable to all languages) approaches in linguistics. Though the terms have been employed in different ways (see Headland et al., 1990 for a discussion), they are generally used to denote contrasting ethnographic perspectives: the emic view based on native knowledge, the etic view on the scientifically grounded categories of an observer (Winthrop, 1991).

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The methodological rigor of ethnoscience encouraged some ethnobotanists to consider questions relating to sampling and intra-cultural variation. Despite the fact that people, even within small communities, frequently disagree with each other or know different things (e.g. Hays, 1974, Pelto and Pelto, 1975), intra-cultural variation is all too frequently ignored by ethnobotanical descriptions (Posey, 1992). Chapter 9 deal with consensus as an aspect of the distribution of ethnobotanical knowledge, while chapter 10 deals with the question of intra-cultural variation.

A related methodological development in ethnobotany has been the integration of more quantitative approaches. Several workers have adapted ecological and forestry inventory techniques for conducting ethnobotanical inventories. Vegetation plots in which all individuals, most often trees above a certain diameter class, are tagged are used as a sample to elicit ethnobotanical information (e.g. Balée and Gèly, 1989; Boom, 1987; Phillips and Gentry, 1993a).

Other ethnobotanists have used quantitative approaches to estimate the importance of specific plant resources to the well being of human populations (e.g. Stoffle et al., 1990; Turner, 1988). Medicinal plants, in particular, have been ranked according to several criteria, in order to establish their "importance" or potential efficacy. In chapter 9, I attempt to evaluate the significance of different

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medicinal species to the Ese Eja, comparing and contrasting the merits and limitations of different approaches and criteria.

The 1970's marked an important shift in ethnobotany towards ecology, when workers such as Bye (1976) demonstrated the efficacy and value of this approach to examine human-plant interactions, particularly from a dynamic perspective. The ecological approach has been extensively and successfully applied to ethnobotanical questions, particularly with respect to agricultural practices, and, more recently, forest management (see for example, Carneiro, 1983; Padoch et al., 1985; Salick, 1992).

In the last decades, ethnobotany has been characterized by an increased amount of inter-disciplinary collaboration and thinking (Prance, 1995). In his study of the origins of agriculture and the domestication of crops, Johns (1996) combines approaches from chemical ecology, ethnobotany and nutrition. This evolutionary perspective is examined in greater detail in chapter 11, and utilized in conjunction with epidemiological evidence to suggest that the recent incorporation of large numbers of medicinal plants into the Ese Eja pharmacopoeia may reflect an adaptive response to a shift in the balance with infectious diseases (see also, Davis and Yost, 1983a, 1983b).

The multi-disciplinary and dynamic approach to ethnobotanical questions is exemplified by Alcorn's research among the Huastec (Alcorn 1982), where the

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open-ended, dynamic nature of human-plant interactions is stressed and seen to result from the articulation of the "real" world and the "perceived" world, that is from social, cultural, ecological and evolutionary contexts and their perception. In this way, Alcorn not only discusses human-plant interactions (the "text"), but also the biological and cultural contexts in which these interactions occur. As part of this analysis, Alcorn discusses the factors that decide the ever-changing roles played by humans and plants, and the effect of these processes on the ecosystem itself.

Alcorn's seminal work marked an important shift in the approach and perspective of American ethnobotany, and was a primary influence in the development of my own research questions and agendas. Moreover, it exemplifies a focus which has become increasingly important in Amazonian ethnobotany, combining ecological and anthropological approaches. The insights afforded by these sister disciplines highlight the spatially and temporally dynamic nature of ecological and social processes in Amazonia.

The new Amazonian ethnobotany: insights from ecology, anthropology and ethnohistory

Amazonian ethnobotany has undergone considerable revitalization in the last decades, not only in terms of the volume of research conducted, but also in

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terms of its theoretical development. Moreover, the subject matter of ethnobotany, the relationship between plants and people, is highly relevant to many of the pressing applied and theoretical questions pertaining to the future of Amazonian environments and cultures.

In this regard, Amazonian ethnobotany has both influenced and been influenced by the theoretical development of related disciplines, most particularly of ecology, ethnohistory, archaeology and cultural anthropology. Developments in these disciplines complement each other and reflect a common shift in the understanding of Amazonian ecological and social systems.

One of the themes increasingly shared by the natural and social sciences is the notion that the tropical forest environment and the indigenous subsistence practices and cultural institutions embedded in it, are more heterogeneous, complex and dynamic than was once previously held (see for example Begon et al., 1990; Brookfield and Padoch, 1994; Carneiro 1983; Foster, 1980; Gentry and Terborgh, 1990; Padoch and de Jong, 1992; Parker et al. 1983, Vickers 1979). As a result, many of the typologies categories and classifications used in the past to characterize Amazonian vegetation, environments and resource utilization practices have been revised and refined (Padoch and Vayda 1983; Posey, 1992).

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The simple terra firme-varzea classification for example, masks a wide range of environments, distinguishable in terms of geological history, soils, climate and vegetation (e.g. Prance and Lovejoy, 1985), and this environmental heterogeneity is at least partly responsible for the variability and diversity of subsistence practices (Denevan, 1976; Moran, 1995). The spatial heterogeneity of Amazonian environments and resource utilization practices can be found both regionally and locally. An example of the former might be the differences between black water and white water basins, which in turn have profound implications on resource utilization systems (Moran, 1995). Locally, soils and hydrology can vary considerably, resulting in markedly different vegetation types and resource utilization profiles (e.g. Phillips, 1993).

The temporal stability of tropical forests, and forests in general, has also been seriously questioned. Both long and short-term disturbances are now considered important contributing factors to the diversity and heterogeneity of tropical forests at a regional and local scale respectively.

Geological, paleoclimatological, climatological, and biogeographical evidence suggest significant climate changes during and since the Pleistocene. Drier and possibly cooler periods have been interspersed with moister and warmer periods (Brown and Ab'Sáber, 1979; Haffer 1969, 1974). These and other natural disturbances may be related to the spatial heterogeneity and diversity of plants and animals in Amazonia (Colinvaux, 1993, Colinvaux et al., 1996;

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Prance, 1982; Whitmore and Prance, 1987). These environmental fluctuations may in turn have led to changes in subsistence strategies, migrations and the distribution of ancient human populations (Meggers, 1995; Migglazia, 1982).

Locally, and on a shorter time scale, turnover rates of vegetation have been found to be much higher than was previously thought, and due to tree falls (Hartshorn, 1978) and river activity (Salo et al., 1986). This disturbance is attributed a primary role in accounting for the high biological diversity of tropical forests, not only in terms of species numbers but species composition and habitat diversity as well (Denslow, 1987; Gentry and Terborgh, 1990; Hartshorn,1990).

Ecological disturbances are not only associated with formation of forest gaps, ecological and biological diversity, but have also important ethnobotanical implications. Gap formation, for example, creates assemblages of flora and fauna distinct from those of closed canopies. Pioneer species in these areas frequently attract herbivores and so are of direct economic importance to human gatherers and hunters. Likewise, severe flooding, shallow soils and frequent disturbances are thought to explain the origin of mono-specific and economically important stands of "oligarchic" forests (Peters et. al. 1989).

Changes associated with gap dynamics and vegetational succession are manipulated by farmers, who exploit ecological processes as much as actual

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"resources" in order to obtain specific items (Alcorn, 1989; Irvine, 1989). The work of Posey (1985) and Balée (1993) suggests that humans do not merely "adapt" to their natural environments, but actively manipulate and change the characteristics and ecological potential of their surrounding environments (Balée, 1989), including soils (Hecht and Posey, 1989; Salgado and Demper, 1994; Smith, 1980). Indeed, there is growing evidence that humans may have played a significant role in effecting changes in vegetation previously considered "natural" (Alcorn 1981, Anderson and Posey 1985, Balée 1989; Clement 1989, Denevan & Padoch 1987). Some have argued that anthropogenic manipulation of vegetation has actually helped to increase biological diversity (Anderson and Posey 1989; Balée, 1993; Posey,1984).

Evidence from archaeology, ethnohistory and ethnology over the past 20 years has shown many parallels between the characteristics of tropical forests as living systems and those of indigenous societies as cultural systems. The 1970's saw the beginning of this shift in perception, as the environmental heterogeneity of the Amazon was recognized and its impact on human settlement and social organization understood (Carneiro, 1970a; Lathrap, 1970). Proof of past existence of chiefdoms and socio-politically complex societies on the Amazon, the Llanos de Moxos[3] and the Orinocco (Carneiro, 1979; Denevan, 1966; Roosevelt, 1991; Whitehead, 1994) has had important theoretical implications for Amazonia.

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3. The Llanos de Moxos borders with Tacana territory. Lathrap (1970) believes the Macro-Panoan stock, from which Tacana languages diverged, to have originated in this area.

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The presence of chiefdoms in Amazonia suggests that human adaptation and socio-cultural configurations in Amazonia have been more heterogeneous and variable than had been previously credited (Meggers, 1954). More importantly perhaps, it suggests that far from being archaic, Amazonian societies have continuously and dynamically responded to ecological and historical changes. The arrival of Europeans in particular, signaled a population collapse whose scale and implications on human organization and subsistence in Amazonia has been widely underestimated. Frequently, epidemics spread faster than did colonists. Historians and archaeologists estimate that in the floodplain, indigenous population declined 50 to 95% in the first century of contact (Denevan, 1976; Moran, 1993). Such demographic collapses, common throughout Amazonia and the Americas (Denevan, 1976; Ramenofsky, 1987), led to profound changes in patterns of settlement, social organization and subsistence.

Careful analysis of historical documents and oral testimonies have been used to reconstruct the political organization and subsistence patterns of indigenous groups during the process of contact and European intrusion in Amazonia, (e.g. Whitehead, 1993, 1994). In addition, Amazonian archaeology holds the promise of revealing critical evidence as to the distribution of ancient Amazonian populations and the characteristics of their subsistence patterns (Roosevelt, 1994).

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The contribution of history and archaeology to Amazonian ethnobotany and ecological anthropology is illustrated by the emergence of Amazonian historical ecology where "...historical, not evolutionary, events are responsible for the principal changes in the relationships between human societies and their immediate environments..." (Balée, 1995). This approach is exemplified by Balée's comparative analysis of horticultural and foraging Tupi-Guarani groups. Here, horticultural, trekking and foraging strategies are shown to be the response to specific historical and social circumstances, associated with colonization and demographic disruption (Balée 1992a; 1994).

Likewise, the process of agricultural regression, whereby cultigens and cultivation techniques are abandoned, in some cases leading to the abandonment of agriculture altogether, may be more prevalent than was once believed. Agricultural regression is thought to be closely related to the processes of demographic collapse following the effects of devastating epidemics (Balée, 1992a). Subsistence patterns of hunting-gathering groups like the Yuquí, once thought to represent the lifestyles of uncontacted groups leading a primeval existence, are increasingly viewed to be the direct consequences of historical and ecological processes associated with European invasion and subsequent colonization. (Stearman, 1995).

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The effects of human agency are expressed globally as well as locally, particularly since the development of a global economy and the emergence of colonialism. The value of political economy in highlighting the relationship between local and global processes is epitomized by Wolf's seminal work, (Wolf, 1982), and has been incorporated into much of ecological anthropology. Terms such as "isolated" and "primitive" have been infused with a historical perspective, which suggests that all human societies are subject to the influence of a global economy, even if they do not participate in this economy directly. Contemporary patterns in resource utilization and the characteristics of agrosystems are studied in terms of socio-economic and as well as biological environments (e.g. Padoch and de Jong, 1990).

Science and the Ese Eja

Although my discussion of Ese Eja ethnobotany is largely restricted to one of the many domains of human-plant interactions, notably the beliefs and behaviors associated with health and illness, my approach will be holistic. That is, I will employ a broad range of theoretical perspectives in order to examine the ecological, evolutionary, pharmacological, social and symbolic roles of plants in Ese Eja medical beliefs and behavior. In the preceding sections, I have illustrated the potential of different disciplines and approaches in

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highlighting different aspects of people-plant interactions and their ecological and social significance.

My exploration of Ese Eja ethnobotany is based on two related premises. The first is that human societies and cultural institutions, including resource perception and utilization, are essentially dynamic, responding to and reflecting changes in the natural and social environments on which they are embedded. The second, a corollary to the first, is that the label of "resource" reflects important biological, ecological as well as cultural characteristics and processes (Alcorn, 1982). The roles of a "medicinal plant" reflect not only plant's intrinsic physical or chemical properties, but also the needs and perceptions of the human group in question. Because human needs and perceptions are highly plastic and continuously changing, ethnobotanical processes are subject to considerable variability and dynamism

I regard cultural knowledge of "plant use" as a statement on how a particular plant is perceived: the result of a cultural interpretation projected upon a biological reality. I concur with the view that plant "use" as a "text that derives part of its meaning from the cultural, natural, and social context in which it occurs and serves its function..." (Alcorn 1982:3).

Students of ethnomedicine have suggested that indigenous theories of illness reflect deeper psychological, social and political concerns (e.g. Comaroff, 1978;

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Crandon-Malamud, 1993; Fabrega and Silver, 1973). In this thesis, I will examine a corollary to this perspective; that the social concerns embodied by ethnomedical theory and behavior also include views on human-nature interactions. That is, through the categorization of illnesses and the responses enlisted to either avoid illness or treat it, the Ese Eja express their views of the world, including the natural world, and their relationship to it. Moreover, changes in the Ese Eja social and biological environment, social and ecological change, is evidenced by changes in how plants are perceived and utilized both as material and symbolic objects.

Ultimately, I have striven to understand both the biological and social basis to Ese Eja plant use and perceptions in medicine. As Ross (1987) indicates in relation to the study of food resources in diet;

> *"...the temporal and spatial understanding of differentiation in human diet highlights the importance of the web of social realities in which diet is embedded.....at no time in the knowable human past or present has diet been a clear-cut question of nutritional intake.... it has always been complicated by a social dimension, and the social relations through which the material questions of diet must be regarded have grown increasingly variegated and influential over time. The result is that although the biomorphological or genetic constraints underlying human consumption in the broadest sense have not significantly altered, the factors interposed between them and the ultimate dietary configuration of any given human population have multiplied considerably and assumed a pre-eminent role.."* (ibid:43).

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Organization of the thesis

The thesis is divided into four parts. In Part I (chapters 1 and 2), I introduce the theoretical and methodological context of the research itself, highlighting some of the questions and concerns that informed the structure of my inquiry, and describing the protocols I followed to collect data and establish a meaningful and ethical research relationship with the Ese Eja.

In Part II, I discuss the characteristics of the Ese Eja natural (chapter 3) and social (chapter 4) environments. This material is not merely presented as background information. It is the matrix on which Ese Eja ethnobotanical relations are embedded, and in the remaining discussions I will repeatedly refer to the characteristics of the Ese Eja social and natural universe as frames of reference for ethnobotanical relations. Variability, complexity and the specific circumstances of the social and ecological history are important determinants of the nature of Ese Eja-plant relations. Indeed, this thesis explores the premise that ethnobotanical interactions cannot be meaningfully understood outside of the social and ecological context in which they are embedded. I end Part II with an overview of Ese Eja subsistence practices (chapter 5), introducing themes that later become central to my discussion of plants and health: depopulation, introduction of new plants, increased contact with new social actors and

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ethnobotanical knowledge, and the impact of the interactions with a market economy.

Parts III and IV present the bulk of the data and discussion on Ese Eja ethnobotany. Part III deals with cosmology and shamanism, while Part IV focuses on the use of medicinal substances. In chapter 6, I discuss how the Ese Eja categorize and explain illness. I hope to show that concepts of the body, death, health and illness are positioned within a broader system of beliefs, which is consistently used to interpret, explain and manipulate everyday reality, including death, sickness and misfortune. This world-view is interwoven with a number of ecological and economic themes which recur throughout most Ese Eja cultural institutions, reflecting key social concerns. Health and well being, and its counterparts sickness and death are ultimately seen as forms of exchange between the Ese Eja and surrounding social spaces in a multi-layered and interdependent universe.

In its simplest form, the Ese Eja universe can be represented by three cosmological actors, the Ese Eja or "true people", the ***edósikiana*** or "spirit-owners of game animals and forest spirits", and ***deja***, or "outsiders". Whereas the ***edósikiana***, invisible beings which manifest the productive and destructive forces of nature, ultimately control the abundance of game, ***deja***, control the abundance of manufactured goods. While abundant meat and access to manufactured goods are the consequence of successful collaboration,

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sickness, and death are the manifest consequence of the inverse: war and predation.

Ultimately, social, economic and medical well being are, for the Ese Eja, manifestations of the same underlying processes and dynamics. A considerable part of medical behavior is directed at manipulating the outcome of Ese Eja social and individual relationships with the surrounding universe. In chapter 7, I discuss the role of shamanism in this regard.

There are currently two closely related but distinct systems of shamanistic behavior within Ese Eja society. ***Eyámikekwa*** shamanism, now on the verge of disappearing, is essentially constructed around the relationship of exchange and reciprocity between the healer, the ***eyámikekwa***, and the 'master' of animals and forest spirits, the ***edósikiana***.

Ayahuasca has been incorporated into Ese Eja ethnomedicine since the early 40's, coinciding with the decline of ***eyámikekwa*** shamanism. In contrast to ***eyámikekwa*** shamanism, the referents of ayahuasca shamanism all relate to ***deja***, as opposed to the ***edósikiana***. Each form of shamanism then, relates to a different aspect of Ese Eja experience, and each expresses different aspects of Ese Eja relations with nature. While ***eyámikekwa*** shamanism is related to the past, the ancestors, to hunting and to the ***edósikiana*** , ayahuasca

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shamanism is related to the present, to ***deja*** and to plants, and specifically to certain plants.

Through the use of plants as symbols, I contend, the Ese Eja effectively express and articulate broader economic and social concerns, particularly as subsistence becomes increasingly based on agriculture and interaction with plant resources and markets. Hence, beyond examining the logic and characteristics of Ese Eja shamanism, I attempt to describe how this system operates as a dynamic entity, and how it responds to and reflects ongoing social and ecological change.

Chapter 7 examines medical behavior in the context of ritual and shamanism, which is often community-based and thus social. Chapter 8 examines medical behavior in the context of the medicinal substance utilization, which is essentially solitary or household-based. Like shamanism, medicinal resources are a means by which the Ese Eja attempt to manipulate their relationship with the world around them.

One important characteristic of Ese Eja medicinal resources is that a high proportion of them are attributed by the Ese Eja to have been recently incorporated from outsiders, following contact with ***deja***. Plants, both as organisms and in terms of their ethnobotanical uses, are imbued with social

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identity, further supporting the notion put forth in chapter 6 that plants are used as symbols of contact with deja, and of particular socio-economic configurations.

Having described the characteristics of Ese Eja medicinal resources in chapter 8, I turn to the degree to which ethnobotanical knowledge is shared among the Ese Eja, the subject of chapters 9 and 10. Each of these two chapters examines a different aspect of the distribution of knowledge.

In chapter 9, I focus on consensus and its significance in determining the cultural significance of plants and their uses. I then compare and contrast these results with different techniques and approaches used to quantify salience or importance of plant resources.

In chapter 10, I turn to the corollary of consensus: variation. I describe the degree to which ethnobotanical knowledge is subject to individual variation, exploring its characteristics and theoretical relevance. Finally, I examine the role of two variables, community and gender, in creating intra-cultural variation.

In the final chapter, I seek to explore the role of Ese Eja medicinals in the context of an ecological transition to a more sedentary lifestyle and the concomitant changes in health conditions. Specifically, I suggest medicinals may have served an adaptive purpose is the shifting balance between human

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populations and diseases. In this way, I illustrate the role of medicinal substances as pharmacological objects, complementing the previous discussions of plants as symbolic objects.

Through their symbolic and pharmacological manipulation, plants are powerful resources utilized by the Ese Eja to negotiate their place in a rapidly changing world.

Ethnographic and ethnobotanical sources on the Ese Eja

Ethnographic, and particularly ethnobotanical, accounts on the Ese Eja are scant and often based on dubious sources, including third-hand reports and very short periods of field work. The earliest written reports are those of missionaries, explorers and travelers who visited the Madre de Dios and northern Beni (e.g. Alvarez, 1899; Anonymous, 1771; Armentia, 1883, 1887; Carbajal, 1908; Evans, 1903; Fawcett, 1911, 1955; Guillaume, 1890; Hassel, 1905; Labre, 1889; Maticorena, 1902; Miller, 1836; Villalta, 1902, 1904). Dominican missionaries provided an extensive range of accounts relating to the Ese Eja, following their arrival to Madre de Dios in the early 20th century.

Though invaluable, these historical accounts are often hard to use, given the tendency for many these early writers to mix direct observations with third-hand

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reports, conjectures and assumptions, in ways which are at times palpably distorted by specific political or religious agendas.

Evangelical missionaries in Bolivia have worked with the Ese Eja since the 1950's, and published some accounts of Ese Eja culture, mostly linguistic (e.g. Shoemaker and Larson, 1983; Shoemaker and Shoemaker, 1967, 1983). One paper in particular, entitled "Migraciones de los Ese ejja" (Shoemaker et al. 1975) discusses recent migrations of the Ese Eja. The paper has been repeatedly cited and used by subsequent writers, who have thus recreated and diffused some of important misconceptions and errors concerning Ese Eja social organization and the timing of migrations (e.g. Rivero, 1985).

A number of ethnographies on the Ese Eja have been published, covering the different subgroups. Hissink and Hahn published several accounts concerning the Madidi Ese Eja living on the upper Beni (e.g. Hissink and Hahn, 1988), mostly relating to material culture, and based on their fieldwork in the 1950's. Zeleny (1976, produced a monograph on the Ese Eja of Palma Real, Rio Madre de Dios, Peru. Kimura (1981, 1983) has published a number of accounts pertaining to kinship terminology and mythology, based upon his fieldwork with the Madidi Ese Eja in Villanueva, Rio Beni, Bolivia.

The language and oral traditions of the Bawaja Ese Eja of Infierno, and to a lesser extent Palma Real, have been extensively documented by Peruvian

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linguist María Chavarría (Chavarría 1973, 1980, 1984a, 1984b, 1985, 1987, 1993). Much of this important material was recently incorporated in her thesis (ibid, 1996). A general ethnographic account, incorporating field data as well as written sources, is provided by Chavarría and Sánchez, (1991). Firestone (1991) published an ethnography of the Ese Eja, based on the notes collected by New Tribes missionaries.

Garreth Burr, a British anthropologist, conducted his graduate fieldwork among the Sonene Ese Eja during the years 1991-1993, focussing on shamanism and mythology. His thesis (Burr, 1997) provides a valuable addition to the body of mythological texts collected by Chavarría and others, as well as an extensive discussion of Ese Eja shamanism and cosmology.

Written accounts of Ese Eja ethnobotany are practically non-existent. Zeleny provides an appendix of Ese Eja names for a number of wild and domesticated species, but the identification of these is doubtful as vouchers appear to have not been collected. A recent paper (Desmarchelier et al., 1996) on Ese Eja ethnobotany, lists 24 plant species and their uses, amidst a report full of ethnographic and linguistic errors and inconsistencies.

Ese Eja and its transcription

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Ese Eja has 17 consonants and 4 vowels. The alphabet used in this thesis follows from that proposed by Chavarría (1996: 32, see table 1.1). The vowels, /a/, /e/, /i/, and /o /, are all pronounced as in Spanish. The two bilabial plosives, /b/ and /p/, are implosive: that is, they are articulated by drawing air into the mouth, in contrast with the English bilabial plosives, which are articulated while air is exhaled.

Table 1.1 *Ese Eja vowels and consonants*

Phonemic Symbol: Consonants	*Letter Used In Text*	*Phonemic Symbol: Vowels*	*Letter Used In Text*
/b/	b	/a/	a
/tʃ/, /č/	ch	/e/	e
/d/	d	/i/	i
/h/	h	/o/	o
/x/	j		
/k/	k		
/ʔ/	'		
/m/	m		
/ñ/	ñ		
/p/	p		
/s/	s		
/ʃ/, /š/	sh		
/t/	t		
/ts/*	ts*		
/w/	w		
/y/	y		

[* In Bawaja dialect /ts/ replaces /t/ of Sonene dialect]

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These plosives are sometimes articulated as the nasals /m/ and /n/ respectively: that is, they are allophones. The nasals, /m/, /n/, and /ñ/ are all pronounced as in Spanish.

For convenience, the voiceless fricative, whose phonetic symbols are / ʃ / or /š/, will be transcribed here as 'sh', and should be articulated as the 'sh' in 'English'. Similarly, the voiceless alveopalatal affricate, whose phonetic symbol is / č / or /tʃ/, is here written as 'ch', and should be articulated as in the word 'chair'. For the post-velar fricative, /x/, I will use the letter 'j', pronounced as the first consonant in the Castillian Spanish pronunciation of the word "jamás". Likewise, the velar fricative /h/ is transcribed as 'h' throughout the text, and corresponds to the English 'h', as in "how".

The use of 'j' and 'h' for the consonants /x/ and /h/ follows the recommendation of Chavarría (e.g. Chavarría, 1996), but contrasts with the system employed by the Summer Institute of Linguistics for Ese Eja, were the letters 'jj' and 'j' are used.

Throughout the text, glottals, / ʔ / will be marked as an '. In Ese Eja, stress usually falls in the syllable before last. I have only marked the position of stress in a word when it violates this rule. Likewise, glottals are only marked when grammatical rules do not apply. Hence, because all words beginning with a vowel are automatically glottalized, the glottal between 'Ese' and 'Eja' (i.e. Ese Eja) is not marked (Chavarría, pers. comm.).

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The language of the vocabulary employed in this thesis is distinguished by the use of a different notation or font:

Plant:	English (regular font)
Spondias:	Botanical Latin (italicized)
"Ubo" (p)	Peruvian Spanish (quotation marks followed by 'p' in parenthesis when name differs in Bolivia).
"Cedrillo" (b)	Bolivian Spanish (quotation marks, followed by a 'b' in parenthesis, when name differs from Peru).
Diji	Ese Eja (italicized and boldface)

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Chapter 2.

Fieldwork and the Ese Eja

Introduction

As with the social sciences, fieldwork in ethnobotany is profoundly influenced by the idiosyncratic interactions between the researcher and his or her network of "informants" (Ashkenazi, 1997). A large number of factors influence the nature of these relationships, including theoretical approaches, field techniques, ethical and philosophical values, personality and innumerable circumstantial factors. The theoretical questions and assumptions embraced by the researcher, and the means by which these questions are addressed in the specific context of fieldwork. In this chapter, I discuss some of the means I used to explore Ese Eja-plant interactions, and some of the characteristics of my interactions or collaborations with the Ese Eja.

As professionals committed to using their "knowledge, skills, and training to enhance the well-being of human kind" (Code of Professional Ethics, Society of Economic Botany, 1994), ethnobotanists have a set of responsibilities to the scientific community, the general public and their informants or collaborators. These responsibilities raise complex issues, particularly given ethnobotany's role

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in the commodification of indigenous knowledge in colonial and post-colonial contexts (Alexiades, 1997; Brockway, 1979). Questions relating to representation and property rights, and the relationship between science and industry are all becoming increasingly important, and need to be addressed by researchers (e.g. Lair, in press.) In this chapter, I also seek to address these issues.

Fieldwork history

Although the origins of this thesis date back to 1985 (see chapter 1), my doctoral fieldwork began in May 1994, when I joined my wife and anthropology graduate student, Daniela Peluso in the Ese Eja community of Portachuelo, Bolivia. After a brief return to the US, we traveled to Madre de Dios, Peru. Between January and December of 1995, we lived in the Ese Eja community of Sonene. During that time, I made several short visits to the Ese Eja community of Infierno in order to continue ongoing projects in "Centro Ñape", the community health center where I conducted the quantitative ethnobotanical survey in 1988 (see figure 3.2). This included conducting a re-census of the one-hectare ethnobotanical survey plot[1]. In addition, we returned to Portachuelo on April 1995 for a short

1. Support for the re-inventory of this hectare plot was kindly provided by a National Geographic Society grant awarded to Oliver Phillips and Rodolfo Vasquez.

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visit. In October 1996, we returned to Sonene and Portachuelo for another 3 months, totaling 20 months in the field as part of our doctoral fieldwork.

Though primarily derived from my graduate fieldwork, some data and many of the insights included in this thesis are also derived from fieldwork conducted in the area before graduate school. The opportunity to work in the same region over an extended period of time has offered me first-hand experience of the process of change, and also allowed me to develop the meaningful and productive personal relations on which sound fieldwork is based.

My collaboration with Daniela has been particularly important for many different reasons. Being a couple in the field presents enormous advantages, particularly as social interactions between unrelated members of the opposite sex are often censured by cultural norms. Because single adults are considered to be more amenable to entertain illicit sexual relations, single men and women are viewed as potentially de-stabilizing to community life. As a single man particularly, it would have been very problematic to work with women, and my views and data would have been distorted in significant ways. Indeed, ethnobotanical and anthropological studies have frequently an unstated but critical male bias which I sought to address in my work with the Ese Eja[2]. Through her work and close friendships with women, Daniela provided me with an entirely different

2. Even so, my main informants were all male, and so there continues to be an inherent male bias in my discussions. Nevertheless, the bias in my views has somewhat been tempered through my collaboration with Daniela Peluso, and will be further balanced following her ethnography on gender and the Ese Eja.

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perspective on community dynamics and social organization. This was particularly important given that Ese Eja women are more inclined than men to discuss issues relating to social relations.

Language and fieldwork

A considerable amount of time in the field, especially during the first part of our work in Portachuelo, Bolivia, was invested in learning Ese Eja. Although all Ese Eja are to a greater or lesser degree bi-lingual, a basic command of the language is necessary in order to gain a basic understanding of native categories and perceptions. Most verbal interactions regarding daily aspects of village social and community life were conducted in Ese Eja, particularly during the later months of fieldwork, when I even began to dream in Ese Eja. My knowledge of Ese Eja was sufficient to construct and articulate simple questions and basic elicitation frames, and likewise to understand straightforward responses. Consequently, I was able to conduct some of the more structured interviews in Ese Eja. Furthermore, I was able, with some help, to understand and transcribe recordings of myth segments and several healing and communal rituals we witnessed and participated in, including ***emánokwana***, ***epowi-sese***, and ***eshasha-powi***. More involved discussions however, particularly those involving abstract or complex questions, were conducted in Spanish, or using a mixture of both. Though adequate, my language skills are clearly one of the strongest

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weakness in my study.[3] More than gaining linguistic competence however, the resolve to learn Ese Eja signaled to our hosts a broader commitment, as well as genuine interest and respect for Ese Eja culture, in turn critical for the development of meaningful personal relationships.

Data collection and field techniques

I used a range of different data-collecting techniques, each according to the nature of the data and to a number of circumstantial factors. For the sake of convenience, I discuss these separately, though obviously the use of different techniques frequently overlapped. In general, I reserved the use of the more structured interviews and "closed"[4] questions for the latter part of the study. This not only follows from standard ethnographic advice (Bernard, 1994), but is also due to the fact that the Ese Eja tend to be uncomfortable in "interview" situations, particularly if rapport with the researcher is not well developed. That is, the context of the formal interview introduces an atmosphere characterized by explicit expectations on the side of the interviewer, and expresses a social dynamic that contravenes Ese Eja notions and etiquette of social interaction.

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3. I am very grateful to Mike and Chela Riepma, Todd and Tammy Comstock, Guido Tirina and María Chavarría for their help with Ese Eja language.

4. The degree to which a question is "open" or "closed" refers to the breadth of response allowed. A question which demands a "yes-no" answer is an extreme example of a closed question. The less specific the question, the more open. Open and closed questions serve different purposes in the ethnographic interview and have different strengths and shortcomings. Basically, closed questions yield more precise, succinct data, but are harder to construct and articulate in cross-cultural settings, and hence are more open to introducing bias and errors (Bernard, 1994).

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Such reticence or "shyness" is, I believe, the product of several factors. First, the Ese Eja are initially suspicious, of all outsiders. Certainly, the experience of past contact with outsiders has been often traumatic. Interactions between the Ese Eja and other nationals are still underscored by the racism and injustice that define much of the social and political life of Andean nation states. Though eager to establish exchanges and reap the benefits of contact with the nation state and with outsiders, the Ese Eja are simultaneously cautious and suspicious of such interactions (see chapter 6). Burr, who notes "the difficulty of getting information from Ese Eja people" sees this, correctly I believe, as a form of resistance, and a "critical aspect of mythopoeic self-determination" (ibid.: 111).

I believe that Ese Eja reticence to entertain discussions with outsiders is consistent with Ese Eja protocols for social interaction. Visiting outsiders, including Ese Eja with no kin ties, are customarily not offered food or drink upon arrival for example. This contrasts with the etiquette of Ribereño and other indigenous groups, which emphasize hospitality to strangers. From an Ese Eja vantage however, offering food or drink to an outsider places him or her in a compromising position as by accepting the 'gift' s/he risks being poisoned[5] and by rejecting it s/he is certain to offend the host. Likewise, conversation is frequently sparse and somewhat strained at the early stages of any relationship,

5. I do not mean intentionally poisoned, though this may have happened in the past. Rather, taking food from a stranger, one is not sure if it has been procured according to the necessary protocols to avoid it being polluting.

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and all potentially confrontational topics are skillfully avoided. Over the years it has become clear to me that the Ese Eja, perhaps due to their legacy as an egalitarian society with limited formal means for conflict resolution, are extremely adept at avoiding any form of direct confrontation, as this could rapidly escalate out of control. Of course, all social protocols do that, but different societies have different estimations of what an "embarrassing" or "confrontational" situation is. For reasons that are too complex to outline here, much of what would be considered necessary in an interview or questionnaire is, from an Ese Eja vantage, potentially embarrassing and confrontational, and hence politely but firmly circumvented.

At the outset of our fieldwork, I had an inadequate idea of what topics were regarded sensitive by the Ese Eja. Likewise, my hosts had no broader framework with which to interpret the context of my questions, and hesitated to answer in order to avoid a blunder or place themselves in a compromising position. During the early months of fieldwork for example, I noticed people became uncomfortable when I asked them what they were planning to do that day, and typically responded something like "(I am doing) nothing". Though apparently innocent enough, my question was vague, and demanded a response in a situation where my neighbors had no way of anticipating my expectations. Was I interested in offering them work? Did I have a suggestion as to what they should be doing (as most outsiders do)? By asking such a question, I was putting people in potentially compromising positions, and violating a basic norm of

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etiquette. Rather than confront me with a question such as "why do you want to know", people deflected the question or answered back in equally vague terms. Only after it became apparent that I merely wanted to accompany people to wherever they were going, and after I had proved that I was no liability to myself or others, were people willing to respond more concisely. That is, only when people had a meaningful personal context in which to understand my questions, were they answered.

Because of these dynamics, much of my fieldwork, particularly during the first months, was conducted in informal contexts, largely involving participant-observation. It was only in the last months that I felt comfortable conducting more structured interviews, collecting plants, and mapping swiddens. With time, as relationships deepened and communication became more effective, we were able to provide more meaningful contexts and perspectives for the Ese Eja to evaluate and participate in our research. Indeed, in my second 3-month visit to Sonene I collected more factual data than I had the entire previous year.

Collecting plants in indigenous communities is frequently particularly problematic. Here again the meaning of an activity is understood in terms of past experience. Plants are invariably collected by outsiders as commodities, and the most logical explanation for plant collecting by botanists is that they are collecting medicinal plants "to sell". In a sense, it would be easier to confirm this view and compensate the community accordingly. Instead, I opted not to collect any

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plants in Portachuelo and Sonene until I could effectively communicate the purpose of collecting plants: a difficult task given the fact that such concepts as "university", "academia", "herbarium" and "taxonomy" are as alien and perplexing to many Ese Eja as the ***edósikiana***, ***eshawa*** or ***emanokwana*** are to most Euro-Americans.[6] Hence, I invested a considerable amount of time in providing the necessary information so that people could draw a more accurate context for understanding the collection of plants for scientific purposes. My past work in Infierno, together with participatory exercises and a number of trips to the local university provided the necessary background knowledge, facilitating an important a dialogue and laying down the conditions through which I obtained community permission to collect plants.

Different data sets were collected with the help of various assistants. During the years 1988-1989 I worked extensively with my Ese Eja friend and colleague Victor Pesha. In Portachuelo and Sonene I mapped fields and collected specimens with the help of several assistants, who are acknowledged by name at the beginning of the thesis. Indeed, part of my obligation with the community of Sonene, was to provide basic training on the use of basic surveying and tree climbing techniques, donating the equipment for communal use at the end of my stay[7].

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6. Moreover, like most other humans, the Ese Eja are generally not pre-disposed to give alien concepts and categories the benefit of the doubt.

7. Upon my return to Sonene, I was very pleased to see that the tree climbing gear was well maintained and frequently utilized to harvest wild palm fruits in non-destructive ways.

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Participant observation

Participant observation is not considered so much a research technique as a context to gain insights, develop meaningful relationships, and formulate specific research questions (Bernard, 1994). As I have indicated above, participant observation was the principal context I used to develop a baseline understanding of Ese Eja-plant interactions. This entailed accompanying the Ese Eja to work on their swiddens, as well as during trips to the forest or river, fishing, gathering and hunting. All too frequently the "observation" component was more successful than my role as a "participant", though my attempts at the latter did prove to be a fairly predictable source of amusement to the Ese Eja.

My previous experience with a primary health care program and the medicinal plant knowledge gained through contact with specialists from other ethnic groups placed me in an unusual position with the Ese Eja, who value and eagerly seek such knowledge through their contact with other social actors and particularly "outsiders" (see chapters 8 and 11). Consequently, I frequently found myself in the role of informant, a rather ironic position for an ethnobotanist.

Being consulted on the use and preparation of medicinal plants did provide a unique context to discuss questions relating to illness terminology and etiology,

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and to observe actual diagnosis and treatment of illness episodes. That is, my practical knowledge of medicinals provided an important context through which to gather additional insights and knowledge, as well as reciprocate with our hosts, and in effect served as a means of participant observation.

At the same time, my ambivalent role as an informant and researcher may have introduced certain biases in responses during interviews, though it is hard to evaluate the extent and the ways in which this would be so. It is possible that my familiarity with "outside" medicinals biased responses toward this category of medicinals, a question I will raise again in chapters 8 and 9. In the end however, I think the advantages of being able to use and exchange ethnobotanical knowledge offset any biases, which were hopefully also minimized through data triangulation and cross-checking.

Interviews

Open and semi-structured interviews

I conducted interviews in a broad range of settings, including in people's homes, fields, forests, travelling by river or in our house. Most interviews were informal or open, and many insights were obtained during casual conversations. Our house gradually became a favorite spot for people to relax, smoke tobacco, look

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at pictures of other Ese Eja, leaf through copies of "National Geographic" and other magazines, drink plantain beer, and talk. After a few weeks, the Ese Eja became used to me constantly scribbling in my notebook during conversations, and to the questions that would follow when we embarked on a subject of interest, as most are.

With time, our friends and neighbors got to know us better and understand the context of our questions. Asking questions became easier, as did conducting more structured interviews, where the direction of the conversation is controlled to some extent by the interviewer (Bernard, 1994).

Structured interviews

Structured interviews, in which responses are elicited using standardized questions or frames, have distinct advantages; namely the efficiency with which data can be collected and analyzed. I have already outlined some of the difficulties of using structured questionnaires with the Ese Eja. The danger of introducing errors through invalid questions is also greater in more formal and structured interview contexts (Bernard, 1994; Werner and Schoepfle, 1987). I used structured interviews to gather specific, mostly ethnotaxonomic, kinds of data.

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Surveys

Chapter 9 is almost entirely derived from a data set obtained through a survey that was applied to a total of 51 men and 34 women from four communities, Sonene, Portachuelo Bajo, Portachuelo Alto and Villanueva. The interview schedule included questions on health and the use of medicinals to treat a range of common Ese Eja illness symptom categories. These interviews included other questions pertaining to Ese Eja demographics, history and health care, not directly pertinent to this thesis (Peluso, in preparation). Most interviews were conducted jointly with my colleague and wife Daniela Peluso, though Daniela conducted some alone. Indeed, as I noted at the outset, Daniela's presence was essential in enlisting women's collaboration, as I would have never been able to interview women alone.

Other techniques

During my time with the Ese Eja, I also collected a considerable body of data on questions which though not directly addressed in this thesis (but see chapter 5), do tangentially affect and helped form many of the ideas discussed. For example, I spent a considerable amount of time, especially in Sonene, mapping

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and surveying swiddens and fallows, in order to determine who grows what, where, when, how and, hopefully, why. Swiddens and agricultural systems are the equivalent of ethnobotanical footprints, tangible arenas of people-plant interactions, and as such are ideal contexts in which to examine and precisely define how humans interact with plants. The diversity and variability found in swidden and agricultural strategies helped to shape many of my ideas concerning Ese Eja-plant interactions.

In addition, I elicited data pertaining to Ese Eja ethnotaxonomy and forest utilization. These research questions, superficially addressed in my thesis (see chapter 5), utilized a series of techniques and interview contexts, including mapping and surveying exercises, participant observation, extended, structured, unstructured and group interviews. All of these have provided, directly and indirectly, data and perspectives which have been included in my discussion of Ese Eja ethnomedicine and medicinal resources. Furthermore, and in collaboration with Daniela, I conducted extensive taped interviews regarding the oral history, genealogy and migrations of the Ese Eja. Though again only a fraction of this data is presented here, in summarized form, the broader relevance and significance of these interviews have also shaped many of the critical arguments and observations presented in this thesis.

Finally, I dedicated a considerable amount of time and attention to observing and evaluating how Ese Eja interactions with external agents is affecting resource

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management practices. The presence of numerous government and non-governmental agencies in such high-priority conservation areas as the Bawaja-Sonene National Park and Tambopata-Candamo Reserved Zone, provided a valuable context in which to examine many issues surrounding the relationship between local communities, conservation and development. Again, an in-depth discussion of these questions is reserved for a separate publication.

Collection of voucher specimens

Every effort was made to make good quality fertile voucher specimen of every plant species discussed by informants, following standard collection protocols (e.g. Alexiades, 1996a). Many of the plants reported during interviews had been previously collected by me or my assistants, during walks with informants in different vegetation zones, or as part of general collecting procedures[8].

In cases where this was not so, and whenever possible, medicinal plants were collected with informants shortly after the interview. Because many of the plants reported in the interviews are well known or common, the taxonomic identity of these is quite certain. Indeed, some of the better known cultigens and domesticates included in the responses were not vouchered for this reason. In a

8. All plants were collected under permits obtained from the Ministry of Agriculture, and following the approval of general community assemblies.

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small number of cases, I was not able to voucher specimens or gather reliable field determinations.

Voucher herbarium specimens were identified through The New York Botanical Garden network of specialists Preliminary determinations, determinations to family level and determinations for "orphan" taxa with no specialists were occasionally made by myself, though in most cases these were also provided by one of several "generalist" taxonomists and botanists.[9] Duplicates of all collections are deposited at The New York Botanical Garden (NY). In addition, duplicates of Peruvian collections are deposited at the herbarium of the Museo de Historia Natural "Javier Prado" of the Universidad Nacional Mayor de San Marcos (UNSM) and those of Bolivian collections are deposited at the Herbario Nacional, in La Paz (LPB). Additional duplicates have been deposited at the herbarium of the national agrarian university of Lima (Universidad Nacional Agraria "La Molina", MOL), the university of Cuzco (Universidad Nacional del Cusco "San Antonio Abad", CUZ), the university of Beni at Riberalta (Universidad Técnica del Beni), as well as Missouri Botanical Gardens (MO), the Field Museum (F), and Kew Botanic Gardens (K).

Identification of animal species was more problematic, particularly for invertebrates. I made no collections of animals, since I lacked the necessary permits and protocols. Taxonomic names for common, well-known or easily

9. See acknowledgements for a full list of specialists and the taxa determined.

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recognized mammal, bird, fish and reptiles were obtained by linking common names with scientific names through the literature, and by using pictures in field guides to determine organisms, at least to family and sometimes generic level (e.g.Campbell and Lamar, 1989; Hilty and Brown, 1986; Lauzanne and Loubens, 1985). However, as Diamond (1989) has pointed out, pictures are often unsuitable to elicit ethnotaxonomic information, as they frequently lack the information used by local informants to identify organisms[10]. The ability to perceive scale in diagrams for example is a process of cultural translation, akin to reading, which must be learnt and which oral cultures do not necessarily have. Likewise, many aspects of behavior, in the case of animals, and habit in the case of plants are frequently used in the identification process.

Ethics and fieldwork

Whereas anthropologists have formally considered the ethical implications of research since the 1970's (Beauchamp et al., 1982: 3ff), ethnobotanists have only recently started to consider issues relating to rights and ownership over cultural and biological resources, and to questions relating to power relations in the field (e.g. Boom, 1990; Kloppenburg and Balick, 1996; Laird, in press; Posey, 1991; Society for Economic Botany, 1994). These discussions are highly relevant, and reflect the

10. The same applies to the use of herbarium specimens, or branches from tall trees. These objects frequently lack much of the information used by local peoples to identify and name plants and hence were not used as elicitation frames in this study.

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fact that both knowledge and genetic resources, the raw materials of ethnobotanical research, are becoming increasingly valued as commodities by the private sector (e.g. Baumann et al., 1996)[11]. As several authors have noted, one problem emerges out of the fact that knowledge or resources that are considered public in one realm, can become commodities in another (Cunningham, 1996; Kloppenburg, 1988).

In recent years, a number of corporate and semi-corporate initiatives have sought to establish collaborative ventures with indigenous and local peoples, as a means of developing equitative models of exchange and promote sustainable development and conservation of cultural and biological resources (King and Tempesta, 1994; Laird, 1993). A corollary process to the commodification of knowledge, is the fact that it is becoming increasingly difficult to maintain a strict distinction between academic research and research with commercial implications. This, in part, is due to the fact that economic liberalization policies and decreases in public funding has made research institutions more dependent on corporate funding. Additionally, advances in communications and data management technology mean that published reports- the bread and butter of academic research- can be accessed much more efficiently by corporate research teams (Alexiades, 1997).

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11. The question of adequate compensation and intellectual property rights is actively being discussed at present and is probably far from reaching an effective or standardized resolution. For an excellent compilation of viewpoints and discussions of the different issues, see Brush and Stabinsky (1996).

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One of the implications of this process is that research results or collections originally intended to serve an academic purpose, may increasingly have commercial applications, at times without the researcher's knowledge or consent. Thus, herbarium specimens originally collected as part of a floristic survey or inventory project could, in theory, be subsequently accessed for commercial purpose, following an agreement with the host institution. Several authors have cautioned about the enormous difficulty of tracking the large amounts of biological materials currently being collected under the premise of scientific research (e.g. Parry, in press). One important issue then, is that researchers may loose control over the final use of field collections, specimens and data when these become public, either through publication in academic journals or through their assimilation into the Institution's holdings. Publication and disclosure of ethnobotanical knowledge by well-meaning academics could potentially jeopardize the ability for the local community or group in question to negotiate terms of monetary compensation at a later date with a corporate entity.

These challenges may be addressed in a number of ways. In their publication on Yanomami ethnobotany, Milliken and Albert (1996, 1997) only include those species whose ethnobotanical use has already been published and thus rendered public in a previous publication. I too will adopt this strategy: that is, plant resources and knowledge whose potential status as a community-owned commodity has not been jeopardized by a prior publication, are not identified in the following discussions by vernacular name, scientific name or collection

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number. Since my herbarium labels do not include ethnobotanical information, as an additional way of protecting the intellectual property of the Ese Eja[12], I consider that the intellectual property rights of Ese Eja medicinals as a whole have been safeguarded. A similar policy was adopted for a health care medicinal plant manual recently published with the regional indigenous federation, FENAMAD, following discussions with indigenous leaders (Lacaze and Alexiades, 1995).

It is also appropiate to distinguish between different types of knowledge since, after all, some kinds of data have a more direct commercial application than others. In this sense, medicinal plant knowledge might be more readily perceived as having a commodity status than ethnotaxonomic knowledge of wild birds for example.

Aside from considering aspects relating to intellectual property rights, I have also paid careful consideration to other questions relating to inter-personal relations and ethical fieldwork conduct (Alexiades, 1996b). In this regard, permission to conduct fieldwork was solicited from several state and indigenous organizations, including the Ministry of Agriculture, the regional indigenous federation, FENAMAD, and the community itself. Formal and informal discussions with community members as to the objectives, expectations and implications of the research were conducted before and during the fieldwork process. Likewise,

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12. This applies only to collections made after 1990. Prior to then, I had not considered the implications of including ethnobotanical information on herbarium labels.

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compensation to communities was agreed upon formally, including some monetary and material assistance, coupled with an ongoing commitment to produce a bi-lingual health manual co-written and illustrated with several Ese Eja (Alexiades et al., in preparation). Additional compensation through exchange of money, goods and services was also effected with individual informants and family groups. These dynamics are clearly easier to conduct in an equitative fashion in a smaller community, such as Sonene. In effect, different approaches need to be selected depending on the circumstances, needs and expectations of the concerned parties (Alexiades, 1996c).

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PART II: THE ESE EJA

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Chapter 3.

The Ese Eja Natural Environment

Introduction

Written records and oral accounts suggest that between the 18th century to the middle of the 20th century, the Ese Eja territory (Figure 3.1) was roughly delimited by the Tambopata and Malinowski rivers to the west (Peru), the Madre de Dios river to the north, the Madidi river and its affluents to the east (Bolivia), and by the forested foothills of the Andean cordillera to the south. This area, just under 100,000 km^2, is biologically and ecologically extremely diverse and variable, albeit poorly known.

The heterogeneity of the Ese Eja biological environment reflects two important ecological gradients. The first, and most dramatic, is altitudinal, extending from the snow-capped peaks of the Andean cordillera, some of which exceed 6,000m to lowland Amazonian tropical forest. The territory traditionally[1] occupied by the Ese Eja includes the lower easternmost flanks of the Andes, though lowland

1. The term "traditional" needs to be historically contextualized given the migrations and displacements of Ese Eja in pre- as well as post-Columbian history (see Zeleny 1976). I use the term to refer to the time period within living memory, prior to protracted and direct contact with rubber tappers, missionaries and other external agents, and prior to the major changes in social organization and subsistence that followed from the broad integration of the Ese Eja into the market economy. In effect, this corresponds to the turn of the century and the early decades of the 20th.

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areas were also utilized, particularly during the dry season when turtle eggs and other protein resources become highly abundant. A second ecological gradient extends from the more humid tropical forests of the northeast, to the drier vegetation- including tropical savanna and "cerrado" - of the east and south. In addition to this spatial variability, the whole region is exposed to marked seasonality: its location 12° south of the equator means there is a marked a marked dry season between the months of June to October.

Colonization and the intensified contact with external agents over the past century has led to the gradual migration of the Ese Eja downriver: from the more inaccessible rugged headwater regions towards the low, more heavily populated and easily accessible mouths of the major tributaries of the Madre de Dios and Beni rivers (Figure 3.2). As a result of these migrations, the boundaries of the Ese Eja inhabited space have recently shifted toward the east and north, extending as far as the lower margins of the Beni river, close to the city of Riberalta, and away from the rugged and isolated headwater regions (Shoemaker et al., 1975).

The migration of the Ese Eja from the Andean foothills to the lowlands has been accompanied by increased sedentism and nuclearization around one of five population settlements (see Chapter 4). As a result of these two processes, the ecological universe of the Ese Eja has changed.

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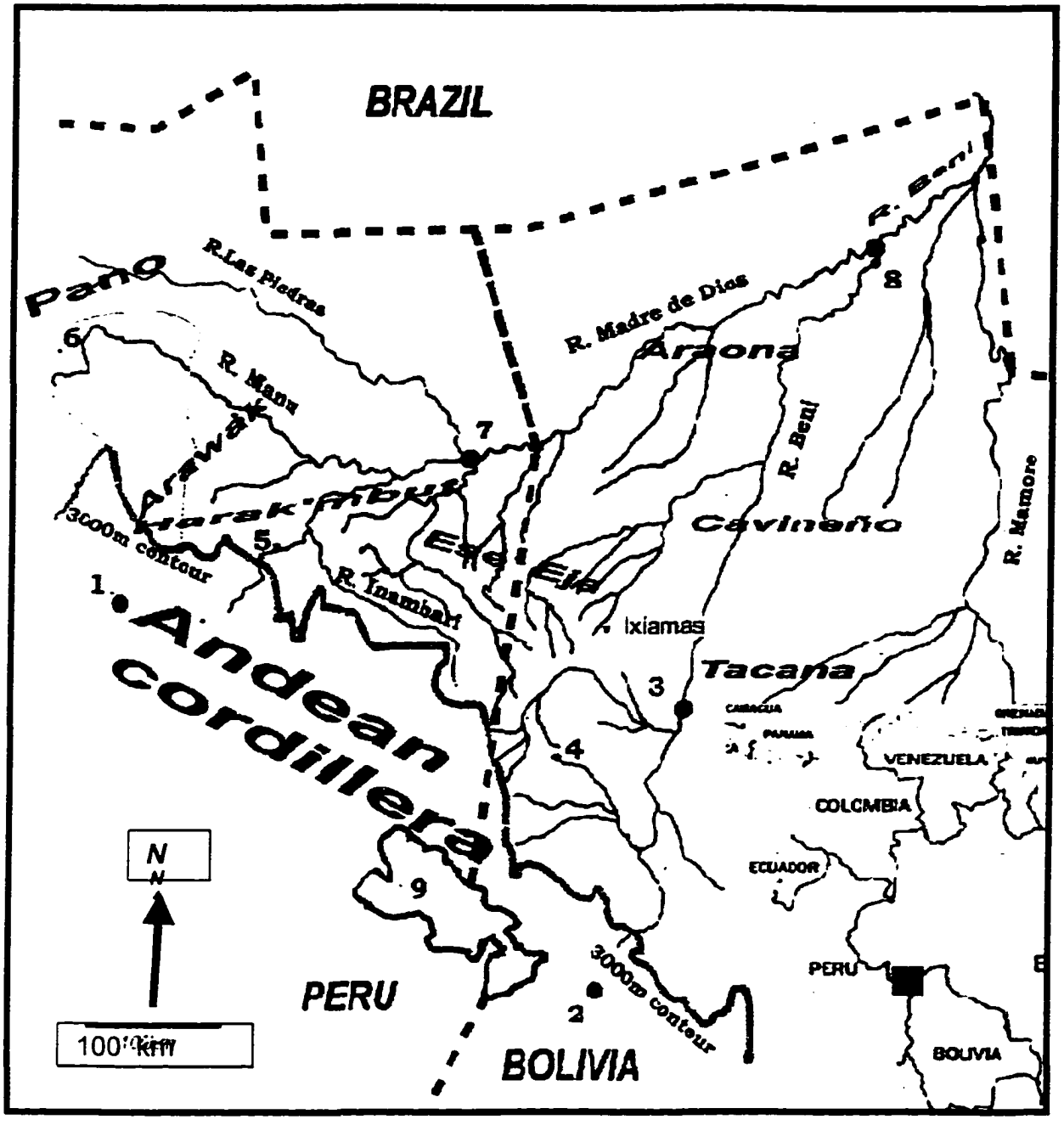
Fig. 3.1 Ese Eja territory and neighboring tribes



Key:

1. **Cusco**
2. **La Paz**
3. **Rurrenabaque**
4. **Apolo (Cordillera de Apolobamba)**
5. **Quincemil**
6. **Isthmus of Fitzcarrald**
7. **Puerto Maldonado**
8. **Riberalta**

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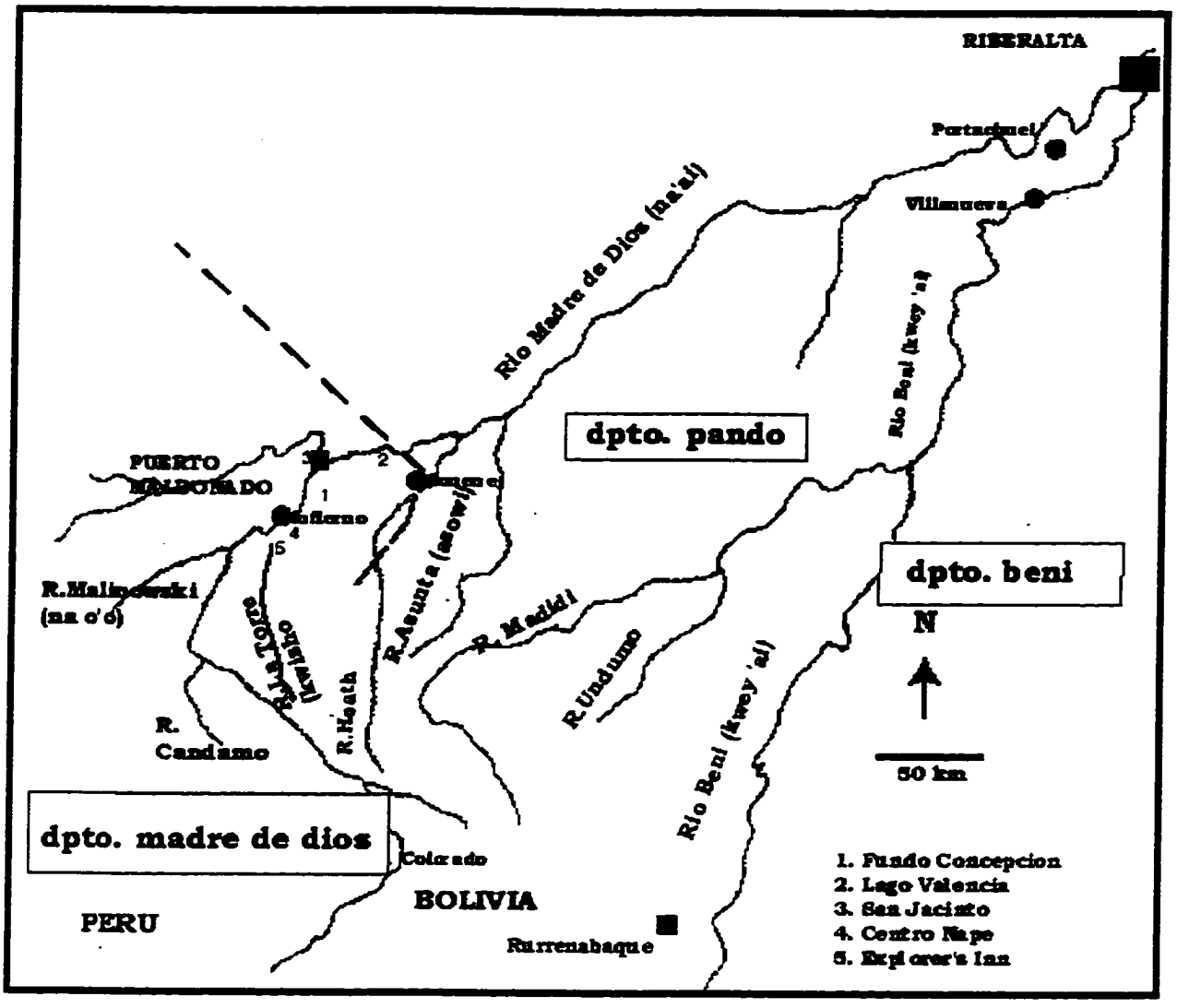
Figure 3.2. Ese Eja Communities



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The headwater regions have become increasingly relegated to the memory of the past, as new relationships continue to be forged with the biological resources of the lowlands. In effect, Ese Eja social and ethnobotanical interactions are inextricably embedded in a mosaic of natural environments, in ways which are mediated by historical and social processes.

The Madre de Dios-Beni drainage system

The Ese Eja territory is drained by tributaries that flow from the Andean cordillera into the Madre de Dios and Beni rivers. At its juncture with the Beni river in Riberalta, Bolivia, the Madre de Dios becomes the Beni. Eventually, the Beni flows into the Madeira, which in turn merges with the Amazon river just below Manaus, Brazil, about 1500 miles northwest from where the Ese Eja live.

The headwaters of the three major Ese Eja tributaries, Tambopata, Sonene and Madidi, all converge in an extremely rugged and isolated area of the Apolobomba province, department of La Paz, Bolivia. North of Lake Titicaca, at about 1000-2000m above sea level (Figure 3.1), this intractable region marks the southern border of the area inhabited by the Ese Eja around the turn of the century. The rivers in this region originate in the snow-capped peaks and glaciers and the eastern flanks of the Andes further south, passing through alpine and "páramo" regions. From the Apolobomba region, the Tambopata, Sonene and Madidi rivers

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radiate out toward northwest, north, and northeast respectively, eventually flowing into the Madre de Dios and Beni rivers.

To the northwest of the Ese Eja territory, beyond Harakmbut territory (see Chapter 4) in what is now Manu National Park, is the Fitzcarrald Divide. This watershed separates the Madre de Dios from the Urubamba and Ucayali drainage systems. The Beni river on the eastern border of Ese Eja territory marks the beginning of the transition to a large savanna area known as "Llanos de Moxos", with gallery forests and the drier Cerrado vegetation further south and east. Outliers of the Beni savannas are found as far north as the Heath river.

The whole region is subject to a marked seasonality in rainfall distribution, with a dry season extending between the months of June and October. The severity of this dry season decreases toward the equator and with elevation: thus, although the upper ridges receive rain all year round, the amount and prevalence of rain is more intense during the months between November and March. Conversely, the dry season becomes more pronounced with decreasing elevation and towards the southeast. In the lowland areas, weeks and even months can pass with no rain during these months. This in turn triggers a deciduous response among certain species, such as *Ceiba pentandra* (L.)Gaertner.

During the dry months, river levels decrease considerably, particularly in the middle and upper courses, where channels are narrower. Here, the watermark

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may descend by 15 meters or more, exposing large sandbars. During the rainy months rivers swell, becoming more turbid, covering sandbars and flooding some parts of the floodplain. All subsistence practices, including agriculture, hunting, fishing and gathering are strongly influenced by this seasonal distribution of rain, with its effect on plant growth cycles, phenology, and on animal foraging and breeding behavior (chapter 5).

Viewed in cross-section, the Ese Eja territory can be divided into three major zones: the upper ridges at an elevation of 1000-1500m, the lower hills and terraces between 500-800m, and the low flat Amazonian plain, averaging 200m above sea level. I will now discuss each of these ecological zones separately.

The upper ridges (1000-1500m)

These upper ridges are part of the so-called Subandean Belt or Front. Here, Ordovician, Devonian and Cretaceous rock layers push up through Tertiary hills, forming a series of parallel chains on a rough northwest to southeast orientation, intersected at several points by some of the rivers. The hard, continental sandstone of this range form a series of knife-edge crests with steep landslide-ridden flanks. The topography in this region is extremely rugged, and rivers are turbulent, clear and un-navigable, with an alluvial substrate consisting mostly of rocks and boulders (Foster 1991, 1994, in Foster et. al, 1994). This area is also

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extremely wet, characterized by cloud forest formations and mid-elevation wet forest. Although there are no precise climatological records for this area, typically the climate for this elevational range is characterized by mean temperatures of 20-25 degrees Celsius and rainfall ranging between 3,000-5000mm (de Morales, 1990). This region marks the uppermost ecological boundary of the Ese Eja territory.

The topography and persistent cloud cover at this elevation make the practice of swidden agriculture difficult. According to verbal reports from the Ese Eja, in the past some groups did establish settlements in these elevated regions, but would plant their plantain swiddens further down in the valleys. The isolation of these inaccessible hills was particularly useful at times of conflict, when the Ese Eja sought to avoid contact with hostile groups of rubber tappers or warring groups.

The whole area is poorly known biologically, largely due to its ruggedness and inaccessibility. This altitudinal range, especially along valley floors, includes a considerable overlap between montane flora (e.g. *Clethra*, *Laplacea*, *Podocarpus*, *Schefflera*) and lowland flora (e.g. *Simarouba*, *Sloanea*, *Symphonia*, *Tachigali*) (Foster, 1991: 26). The high rainfall results in an abundance of epiphytes, and so the families Bromeliaceae, Orchidiaceae and Araceae are all well represented. There is evidence to suggest considerable variations in vegetation composition, both within and between each of the different tributary areas. Gentry (1991:19, in Foster, 1991) for example, notes

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that in the foothill ridges of the Madidi, tropical families such as Piperaceae and Annonaceae are relatively under represented compared to adjacent Peru. In contrast, 'southern' families such as Myrtaceae and Proteaceae appear to be unusually well represented. In the Madidi at least, the forest appears to be characterized by the numerous tree species of Rubiaceae (e.g. *Cinchona*), as well as by Melastomataceae (e.g. *Topobea*, *Miconia*) and Lauraceae. The phytogeography of this zone, at least in the Madidi, indicates unusually high presence of lowland families like Caryocaraceae, Quiinaceae and Humiriaceae. Indeed, the presence of *Iriartea deltoidea* R. & P. above 1,500m appears to represent new altitudinal extremes, certainly for this latitude (ibid.: 28).

The lower hills (500-800m)

Ethnohistorical evidence suggests the Ese Eja centered a large part of their subsistence activities at this elevation range, at least prior to protracted contact with rubber tappers, missionaries and "patrones" beginning in the 19th century.

The lower Tertiary hills and terraces in this region are mostly composed of clayey rock. As these strata are undergo tectonic uplift, fast-flowing rivers wear down through the recent sediment and into the older material. The sediment of the rivers at this point is derived from both the high ridges and the hills, and tends to be sorted out or mixed differently depending on the conditions of deposition.

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This in turn results in a mosaic of soils, of quartz and clay substrates. Although most parts of the channel are navigable at these elevations, the flow is still very fast, and includes rapids, where the harder substrates emerge through sedimentary deposits (Foster, 1991, 1994).

The patchy distribution of clay or sandy based soils in this area creates a mosaic of different forest types, which in turn accounts, at least in part, for the high ecological and biological diversity of the area. Altitudinal differences in flora seem less striking within this elevation range, and not anywhere as important in determining the characteristics of the vegetation as are soil differences (Foster, 1994, in Foster et al., 1994: 16). The area is dominated by elements of lowland vegetation, such as *Dipteryx micrantha* Harms, but includes montane species as well, such as *Podocarpus* and many cloud-forest epiphytes.

Although the composition of plant families in these lower hills is similar to that of the adjacent lower areas, the species composition is entirely different (ibid). The absence of *Ficus* and the scarcity of such palms as *Oenocarpus mapora* Karst., *Socratea exorrhiza* (Mart.) Wendl., and *Euterpe precatoria* Mart., contrasts with their abundance lower down. In addition, the families Myrtaceae, Violaceae, Clusiaceae, Nyctaginaceae and Rubiaceae are better represented at these higher elevations, at least in terms of species numbers (Foster, 1994: 45).

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Preliminary data suggests that the forests along this elevation range on the Madidi river are extremely diverse, probably more so than on rivers further north. This contradicts the general geographic trend whereby diversity increases toward the wetter forests closer to the equator. One possible explanation is that the Madidi may receive unusually high precipitation due to its location at the base of the adjacent 'corner' of the Andean foothills (Gentry, 1991: 21, in Foster, 1991).

The lower floodplain (200-400m)

As the rivers enter the flat expanse of the Brazilian shield. they slow down, meandering across a broad floodplain at about 250 meters. The characteristics of the water changes here, becoming laden with silt and hence quite turbid. Free of their constraints of the Andean range, the rivers meander widely, constantly eroding their banks and leaving behind oxbow lakes, cutoff meanders, meander sacs and large islands (Campbell, 1985). Relatively small river systems, such as the Heath, never develop large floodplains and are not associated with the rich lacustrine and riverine resources that characterize the lower reaches of the Beni, and to a lesser extent the Madidi.

The lower reaches of the Tambopata are intermediate between the Heath and the Beni in that although flooded forests do occur here, they are not as extensive or ecologically prevalent as in the *varzea*-dominated regions of the lower Beni.

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Indeed the lower reaches of the Beni river mark the boundary of vast plain extending east, known as the "Llanura Beniana". This vast region is formed entirely of deep sediment depositions of clay, silt and sand of Tertiary and Quaternary origin. The only appreciable topographic feature in this vast region are the natural levees bordering the rivers, making the "Llanura Beniana" one of the largest seasonally inundated areas in the neotropics (Beck, 1984).

The lowland section of the Ese Eja territory can thus be further sub-divided into the northern and southern sectors. The southern section is characterized by extensive alluvial floodplains, with a landscape dominated by *varzea* in the lower Beni. This contrasts to the more heterogenous vegetation, soils and topography of the Madre de Dios, Tambopata and Heath rivers in Peru, in which *varzea* is not as dominant, and interspersed with large areas of non-flooded *terra-firme.*

The lowland area currently occupied by the Ese Eja in both Peru and Bolivia falls under the Holdridge's category of Sub-tropical Moist Forest (Tosi et al., 1975), though numerous forest types can be identified on the basis of soils and other local factors (e.g. Beck, 1986). Mean annual temperature here is about 27°C, with annual rainfall of about 1,500mm (Muñoz, 1980).

The abundance of sandy beaches along the mid and lower sections of the Madidi, Tambopata and Heath rivers is the product of alluvial erosion of quartzites or sandstones in the ridges upriver. These alluvial beaches, ***meshi-***

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jaji, exposed during the four-month dry season that extends between June and October, are extremely important resources for the Ese Eja. Traditionally, bands of extended families would spend the entire season in temporary camps along the rivers, gathering turtle and bird eggs, fishing and hunting. Even today, families will abandon their settlements for days and week at a time during this season, in order to set up temporary camps on along these beaches (see chapter 5).

The vegetation of this area is dominated by lowland species. The floodplain of the Tambopata, Heath, Madidi and their tributaries have the usual array of different successional bands with terraces of different ages each exposed to different flooding regimes depending on the severity of the rains each year. Floodplain forests are structurally dominated by several giant tree species, including some of the largest remaining stands of *Ceiba pentandra* left in the Amazon basin. Common canopy trees include *Cedrela*, *Spondias* and *Ficus*. Floristically, the vegetation is dominated by the families Moraceae, Leguminosae and Arecaceae.

Terraces containing sandy soils, common on parts of the Tambopata, Heath and to a lesser extent Madidi, rivers are characterized by well-drained diverse forests which include stands of *Bertholletia excelsa* Bonpl. Heavy impermeable clays on the other hand, are associated with tropical grassland areas known as "pampas" and with other vegetation zones whose characteristics reflect different degrees of

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drainage and seasonal flooding (Foster, 1994:37). Between the three rivers, high ancient terraces extend toward the mountains, grading into more recent alluvium fanning out from the foothills.

Large bamboo stands (mostly *Bambusa weberbaueri* (Pilg.) McClure and *B. guadua* Humb. & Bonpl.), sometimes up to 100 km long and of unknown origin, are also common below the lower hills. It appears that before the advent of steel tools, these areas were favored as sites for Ese Eja swiddens, as they could be cleared with palm wood tools (Nordenskiold, 1906).

Although the whole lowland area is dominated by typical lowland forest vegetation, species composition does change according to proximity to the lower hills. As one would expect, there is an altitudinal transition in the vegetation, characterized by qualitative and quantitative changes in species composition. Species common in one locale may become rare only a few kilometers above or below. For example, *Chevaliera magdalenae* (André) Smith & Kress, a wild edible pineapple, is very common in the floodplain forests along the Tambopata, in the vicinity of the Chuncho river, but notably scarce just a few kilometers downriver. Likewise, *Chelyocarpus chuco* (Mart.) H. E. Moore, used by Portachuelo Ese Eja to weave mats, is not found on the Tambopata or Heath rivers, but can be found at the limit of its distribution along the lower margins of the Madre de Dios river in the community of Palma Real.

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In addition to the altitudinal gradient, there is a second ecological gradient, extending from the more humid forests in the northeast to the drier vegetation of the southeast. Patches of seasonally flooded tropical grasslands on the Heath and Beni, known locally as "pampas" (***weni-weni***), are actually outliers of the extensive savannas of the northern Bolivian lowlands. Although these areas are believed to be of natural origin, and caused by the combination of seasonal alternation of waterlogging and pronounced droughts, their maintenance is attributed, at least in part, to regular burning (Denevan 1980).

When not subject to fire management, these savanna outliers revert rapidly to scrubland forest, as was recently the case on the Heath river (Rubio, pers. comm., 1995). This may explain the origin of some of the forests found along the D'Orbigny river , which are currently dominated by *Qualea wittrockii* Malme, (Foster, 1994:21). This area was inhabited by the Ese Eja until the dislocations and demographic collapse of the 1930's. The reversion of the D'Orbigny savannas to scrub forest may thus reflect ongoing ecological change in the absence of anthropogenic fire management.

"Sartenjales", extensive low terraces characterized by a complex micro-topography of troughs and hillocks, and dominated by *Attalea*, are typical of northern Bolivia, but can be found just above the floodplain on the Heath, and to a lesser extent Tambopata, rivers. Likewise, the occasional swamps found at the base of the hills in the Tambopata river, which contain mixed stands of *Mauritia*

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flexuosa L.f and *Lueheopsis hoehnei* Burret , represent the northern limit of what is a typical association in much of the forest swamps of northern Bolivia (Foster, 1994:18).

Although the number of woody plant species in any one locale (e.g. 183 tree and liana species in a one hectare plot in the Ese Eja community of Infierno), is comparable to that found in other Amazonian regions, the diversity of forest types and vegetation zones is considerable. For example, Phillips (1993) has described nine forest types in the area immediately adjacent to the Explorer's Inn, Tambopata river, based on drainage, soil types and geomorphologic history.

Wildlife resources

The importance of wildlife in Ese Eja subsistence is underscored by the extent to which traditional seasonal migrations and displacements responded to the distribution and abundance of wildlife resources. The cultural salience of animals in Ese Eja society, evidenced in mythological and ethnotaxonomic systems, is further explored in chapter 5, suggesting a strong historical dependence on these resources.

The habitat diversity of the transitional zone between lowland forest and Andean hills may explain the extraordinarily high diversity of animal species. For

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example, 575 bird and close to 1200 butterfly species have been recorded around the Explorer's Inn, on a 5000 ha reserve at the junction of La Torre and Tambopata rivers (Erwin, 1985).

While some important animal resources, including fish, amphibian and some bird species, have fairly localized distributions, most important game species are found throughout the Ese Eja territory. These include tapir, ***shawe*** (*Tapirus terrestris*, Tapiridae), white-lipped peccary (*Tayassu pecari*, Tayassuidae), collared peccary (*T. tajacu*), agouti (*Dasyprocta variegata*, Dasyproctidae), paca (*Agouti paca*, Agoutidae), spider monkey (*Ateles paniscus*, Cebidae), howler monkey (*Alouatta seniculus*, Cebidae), deer (*Mazama americana*, Cervidae), several species of armadillos (Dasypodidae), and land tortoises (*Geochelone denticulata*, Testudinidae).

Some game species are hunted only seasonally. Spider monkeys, prized as meat, were mainly hunted around May, when they are reportedly fat from eating abundant fruit sources in the forest. Trips were made to certain interfluvial areas at this time by the Ese Eja, with the specific intention of hunting this species. Availability of other protein resources, notably turtle and bird eggs and macaw or bird nestlings, are also distinctly seasonal. The implications of these seasonal fluctuations in abundance of wildlife resources are further examined in chapter 5.

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There are spatial as well as seasonal differences in the distribution of wildlife resources within the Ese Eja inhabited space. Again, this is largely the result of the fact that the Ese Eja live at the intersection of several different ecological systems: montane forest, lowland forest and dry savanna. Woolly monkeys for example (*Lagothrix lagothricha*, Cebidae) are only found and hunted in the headwater regions of the Tambopata, starting at about 400m above sea level. Below that, and continuing throughout lowland Amazonia, river turtles (*Podocnemis unifilis*, Pelomedusidae) become an important resource, particularly during the dry season, when adults lay their eggs in exposed sand bars. Turtle eggs provide a highly abundant, accessible, though seasonally limited, protein resource. These temporary sandbars are also used to gather the eggs of several bird species, including terns (e.g. large-billed tern, *Phaetusa simplex*, Laridae).

The "pampas", tropical savannas, also include some unique game resources, such as the parrot *Ara aurea*, whose nestlings are highly prized by the Ese Eja for their high fat content and taste. In addition, there are several edible rodents only found in these grasslands (e.g. *Cavia aperea*, *Oryzomys buccinatus* and *Bolomys lasiurus*). Surprisingly perhaps, the marsh deer (*Oidocoileus dichotomus*, Cervidae), native to the savanna, was reportedly not hunted by the Ese Eja, nor is the more widely distributed capybara. While considered edible, these species are generally not eaten as the Ese Eja find the characteristic smell and taste of their meat unpleasant[2].

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2. Interestingly, the Indians in the Pantanal region of Brazil have a taboo against hunting the marsh deer (G. T. Prance, pers. comm., 1998).

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The distribution of fish resources also varies spatially and seasonally. The headwater regions are generally not very rich in fish, except during certain times of the year, such as end of the dry season, when certain species migrate upriver to spawn. The dry season also leaves pools of water, either isolated or connected to the main river channel. As the river sediment settles, these shallow pools of clear water become ideal spots for spearing fish.

In general however, aquatic resources are considerably more abundant in the lower courses of the rivers, and particularly in the varzea. Indeed, the Ese Eja currently inhabiting the Madre de Dios and the lower reaches of the Beni river have access to a tremendous range and diversity of fish species, many of which are not found upriver. These are not only found on the rivers themselves, but also in the numerous oxbow lakes, backwater swamps and ponds that form in the alluvial plain. Fishing in these areas is also best during the dry season, when water levels fall and/or the water becomes clearer.

The variability and complexity that characterizes the Ese Eja natural environment is mirrored by that in the social environment. That is, the configuration of social interactions, particularly with respect to other human groups, is also complex and variable, both between different Ese Eja groups and communities, and over historical time. It is to this aspect of the Ese Eja universe that I turn to next.

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Chapter 4.

The Ese Eja Social Environment

Introduction

This section outlines the characteristics of Ese Eja cultural institutions and social relations, which ultimately help shape individual needs, constraints and options with respect to natural resources and their utilization. Ese Eja society, like any other, is profoundly dependent on its relationships with other societies, and is in a constant state of flux.

Though the dynamics of contact between nation states and Neotropical indigenous societies began hundreds of years ago, and considerable change had already taken place before the arrival of Europeans to the Americas, the rate of change and the intensity of contact has increased dramatically in recent times. Among the Ese Eja, the pace of change is so fast that within a community one finds multiple examples of juxtaposed and dislocated realities in how individuals interact with their natural and social universe.

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In this chapter, I seek to sketch out the Ese Eja social environment, including the history of contact and relations with other human groups. Such an endeavor is challenged by the lack of written materials. I will focus mostly on the past 100 years, for which there is more information. This time period also marks the widespread colonization of the area and the direct insertion of the Ese Eja into a market system. My discussion of contemporary Ese Eja history does not in any way pretend to be thorough, and greatly belies the complexity and heterogeneity in the nature and intensity of exchanges that have taken place between the Ese Eja and other social actors. In any event, it will be sufficient, I believe, to identify some of the processes and factors which have helped shape Ese Eja-plant interactions.

Distribution, linguistic affiliation and origins of the Ese Eja

The Tacana linguistic family

Living along several tributaries of the Madre de Dios, on the Madre de Dios river itself, and on the Beni river (see fig. 3.2), the Ese Eja are one of four ethnic groups belonging to the Tacana linguistic family. The territories of the three

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other Tacana groups, Araona, Cavineño and Tacana proper[1] border with the Ese Eja territory to the east (see Fig.3.1). Of all Tacana-speaking groups, the Tacana proper are the most numerous: the official figure of 3,000-5,000 (e.g. Martínez and Carvajal, 1985) may be an underestimate, as many are living as peasants, or "invisible Indians" (Stocks, 1981; Wentzel, 1989), along the middle and lower reaches of the Beni. Most of the Tacana proper live along the Beni below and above Rurrenabaque, and on the road between San Buenaventura and Ixiamas (Wentzel, 1989). The Tacana proper were reportedly living on the upper margins of the Beni river and some affluents, notably the Tuichi, when they were settled in a number of missions including Reyes, San Buenaventura, Tumupasa, and Ixiamas, and beginning in the 17th century (Metraux, 1963:440).

The Cavineño were reportedly moved by missionaries from the left side of the Madre de Dios river (Metraux, 1963:439) to Cavinas in the 1700's. Their ethnic origin is thus uncertain and their adoption of a Tacana language may in effect be the consequence of their missionization (Aracena, 1991:38). With a population estimated at 1, 000 (Plaza and Carvajal, 1985), most Cavineño currently live in the middle-lower course of the Beni river, upriver from the Ese Eja in Portachuelo and Villanueva, and downriver from the Tacana and Ese Eja at Rurrenabaque.

1. I use the term "Tacana proper " for the Tacana language, in order to distinguish between Tacana as a language and Tacana as a language family, which also includes Ese Eja, Cavineño and Araona.

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The Araona are the smallest group of Tacana speakers, with an estimated population of 65 (ibid.), living on both sides of the Manuripe, an affluent of the Madre de Dios north and east of the Heath.

West of the Ese Eja lies the territory occupied by the Harakmbut linguistic family. Once numerous and including at least seven different ethnic groups, the Harakmbut have been effectively reduced to two groups: the Amarakaeri or Arakmbut, and the Wachipaeri. The Sapiteri, Toyeri, Arasaeri and Kisambaeri were practically driven to extinction through epidemics earlier this century, though a few members of each group live dispersed in several communities (Gray, 1996). Others, particularly Toyeri and Arasaeri, intermarried and were assimilated into Bawaja Ese Eja, Harakmbut or Ribereño groups (Chavarría and Sanchez, 1991:29).

Further to the west and north of the Harakmbut, are Panoan and Arawak tribes, including the Yora (Nahua) in the headwaters of the Manu river and the Machiguenga and Piro in the lower Manu and upper Madre de Dios. To the north of the Ese Eja territory, on the other side of the Madre de Dios river, are a number of Panoan and miscellaneous groups, the closest of which are dislocated groups of Kichwaruna, Amahuaca and Shipibo-Conibo brought into the area from other parts of Amazonia as laborers during the rubber boom. Much of this area was originally occupied by Harakmbut and Panoan groups but

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became severely depopulated through devastating epidemics or migration at the turn of the century or earlier. Along the upper courses of Las Piedras river are an unknown number of isolated Panoan, Arawak and perhaps also Harakmbut groups.

Tacana languages were grouped into a single language family by Créqui-Montfort (Créqui-Montfort and Rivet, 1921), based on available evidence at the time. Later, Rivet (1924, cited in Metraux, 1963) proposed the inclusion of Tacana languages within the Arawak family. At other times, Tacana languages have been classified as Panoan. Coterminous to both Arawak and Panoan groups, Tacana languages bear similarities to both (Chavarría and Sánchez, 1991). A number of linguistic studies (most recently, Greenberg, 1987, but see also Girard, 1971; Key, 1968, 1979), have posited a connection between Tacana and Pano linguistic families, suggesting a common origin and affiliation to a larger taxonomic group, currently referred to as Macro-Panoan.

Lathrap (1970) suggests that the Macro-Panoan stock, which he refers to as proto-Panoan, had its origin in eastern Bolivia, from where it spread north along the foothills of the Andes several hundred years ago, displacing Arawak peoples who had already established themselves there thousands of years before[2].

2. Erikson (1993:55), also suggests that the southeastern group of Panoans, including the Chácobo and Karipuna, occupy an area close to that originally inhabited by early Panoans.

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According to this theory, Arawak groups themselves originated from proto-Arawak peoples who began migrating up along the Amazon from their purported origin close to the Rio Negro in central Amazonia around 3000BC. Given the dearth of evidence however, such early migrations are conjectural at this point (Carneiro, pers. comm., 1998).

The restricted distribution of the Tacana linguistic family as a whole does suggest fairly recent branching and origin in Eastern Bolivia. In this case, the Ese Eja would represent the westernmost, and perhaps latest, diffusion of the group. Moreover, other authors have agreed with the suggestion that the Harakmbut were already living in the area before the arrival of the Ese Eja to southern Peru (e.g. d'Ans et al., 1973). Whatever the origins and early migrations of the Ese Eja may have been, ethnohistorical records indicate that by the 16th century, the Ese Eja were already living on tributaries of the Beni and lower Madre de Dios rivers, including the Tambopata and Heath rivers (Alvarez Maldonado, 1899).

Today, the Ese Eja can be divided into three sub-groups, based on minor linguistic differences and geographical origin (cf. Kimura, 1985). These broad groupings are also used by the Ese Eja to distinguish three different dialects. The Bawaja Ese Eja are historically identified with the Tambopata river (***bawaja***) and its tributaries, including the rivers La Torre (***kwisho kwey***), Malinowski (***na***

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o'o), Tavar (***ibabi aniji***) and many others (Figure 3.2). Likewise, Sonene Ese Eja are broadly associated with the river Heath (***sonene***) and its tributaries, including ***na hewa***, ***dejaha cuey***, and ***na tewe***. A third group is broadly associated with the Madidi (***na tawa***) and its affluents, including ***nao'*** and ***epawa tewe***. Shoemaker et al. (1975) also recognized three subgroups, incorrectly described as clans, which they named Bawaja, Sonene and Ese Ejja[3].

Linguistic differences between the dialects are fairly small, and mostly phonological[4]. However, these differences are readily recognized by the Ese Eja themselves, and by some specialists[5]. Again, the fact that linguistic differences are fairly minor, suggests fairly recent differentiation of the three groups. Seeger (1981:229) reports that two hundred years of separation between Eastern and Western Suya have produced linguistic, mostly phonetic, differentiation.

The linguistic and geographic differentiation of Ese Eja groups has contributed to the confusion of names by which they have been identified by Europeans at

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3. The use of Ese Eja as a name for the group as a whole and a subgroup is confusing, and avoided here for that reason.

4. Phonology refers to the structure of and systematic patterning of sounds in human language (Akmajian et al., 1990).

5. Chavarría (1996:6) has only directly observed and recognizes two dialects, Sonene and Ese Eja, suggesting that the Madidi group are linguistically part of the former dialect. However, SIL and more recently New Tribes Mission linguists who have worked extensively with the Madidi and Sonene families believe these to be distinct dialects (Shoemaker, nd; Riepma, pers.comm., 1994). Not being a linguist, I defer to the specialists and await for resolution of this issue. In the meantime, I recognize the distinction of three as dialects made by the Ese Eja.

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various times. Madidi Ese Eja have been referred to as Guacanahua and Chama (e.g. Metraux, 1963). Fawcett (1911) distinguished between the Sonene Ese Eja, which he referred to as Guarayos or Quinaqui, and the Tambopata Ese Eja, which he identifies as Chuncho, Tiatinagua or Echoja. In the past, several authors have considered Tiatinagua to be the correct term for the group as a whole, and thus equivalent to what is known today as Ese Eja (e.g. Metraux, 1963).

In addition, the names Chuncho, Huarayo and Chama have frequently been used interchangeably, not only to describe different Ese Eja groups, but several other indigenous groups, hence creating considerable confusion in the literature. The term Huarayo in particular, has at times been confused with the unrelated Tupi-Guarani Guarayo, found further south in Bolivia (e.g. Fawcett, 1911; Farabee, 1922). Likewise, Chama has also been used for the Shipibo-Conibo. Chuncho on the other hand, is a generic Quechua name, translatable as "savage" and used indiscriminately and pejoratively for all piedmont Amazonians.[6] Finally, the names Mohino, Moino, Moeno, Mohiño, Pacaguara, and Toromona have also been used for the Ese Eja. Of all these denominations for the Ese Eja, only two subsist today: Chama in Bolivia and Huarayo in Peru. Both of these have pejorative connotations, hence the increased use of the self-designated name Ese Eja ("real people").

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6. The term appears to be originally Aymara, and literally mean "head" (Saignes, 1985:152).

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Some Ese Eja oral traditions identify the headwaters of the Tambopata river or ***Bawaja*** as the place where the mythological ancestors descended from the sky along a cotton rope[7]. The Ese Eja frequently state that "a long time ago" (***yawaho nei nei***[8]) they all lived "together". In a schematic outline of Ese Eja history and migrations, Shoemaker et al. (1975) interpret this statement literally, and locate it within the Ese Eja reality of the last 100 years. However, it is evident from written accounts that the Ese Eja have lived dispersed over a fairly wide territory for at least two hundred years. Chavarría (1991) indicates that on the basis of linguistic evidence, the division between Ese Eja groups must have taken place several hundred years ago.

History of the Ese Eja

The Ese Eja prior to the 20th century

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7. Alvarez (1932:49) reports a version which specifically locates the mythical descent to a tributary of the Tambopata referred to as **Shenawaja.**

8. In Ese Eja, "long, long ago" refers to ancestral times, encompassing everything from the generation of their grandparents to mythological time.

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Ethnohistorical, anthropological, linguistic, and archaeological studies of the last decades have done much to illuminate our understanding of pre-Columbian migrations and tribal relations in western Amazonia (see for example; Lathrap, 1970; D'Ans, 1973; Francis et al., 1981). I have already summarized our current understanding of the origin of the Ese Eja and their relations to Panoan, Arawak and Harakmbut neighbors, indicating considerable contact and exchange between these groups. Chavarría, for example, has suggested that cotton was obtained by the Ese Eja through their contact with Panoans (Chavarría and Sánchez, 1991: 28).

The western Amazonian belt is also of particular historical interest due to its proximity and known or suspected interactions with Andean societies (Lathrap, 1970; Casevitz and Saignes, 1988). There is considerable historical evidence to suggest the existence of complex and extensive pre-Columbian trade routes connecting different regions within the Amazon basin, as well between Amazonian, Andean and coastal societies (e.g. Oberem, 1974). The presence of Amazonian motifs and animal remains on the Andean altiplano and the coastal desert indicate long-standing contact, even if some of it was indirect (Saignes, 1985). A range of Amazonian products, including peach palm wood (*Bactris gasipaes* Kunth), live animals, skins and feathers, food products, dyes, resins and medicinal plants were traded in exchange for metal tools, mirrors, beads and fabrics (Gade, 1970:211). In some cases, trade relations continued

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until their disruption during the ravages of the rubber boom in the 19th century (ibid.).

Inca inroads to the Andean piedmont and the upper floodplain are known to have existed along the Palotoa and Piñi-Piñi in the upper Madre de Dios, as well as on the Inambari and the Beni (Saignes, 1981, 1985). Interactions between the Incas and piedmont indigenous societies are particularly well documented and retraceable among for example, such Arawak groups as Machiguenga, Piro, Amuesha and Ashaninka (e.g. Fernandez, 1987; Gade, 1970: 210; Lyon, 1981:5; Wise, 1976). It is also likely that contact existed between some Harakmbut and the Inca (Aikman, 1982; Gray, 1996). Inca control is thought to have even extended to some piedmont regions of the Madre de Dios and Beni, to the extent that some piedmont Amazonians in the Apolobamba and the Upper Beni are believed to have worked at one time for the Inca (Saignes, 1981:156).

Historical evidence for contact between the Inca and Tacana speakers is much weaker and hard to interpret due to confusions in the nomenclature of geographical places and ethnic groups. Nevertheless, such contacts are thought to have occurred (Ottaviano and Ottaviano, 1980; Ulloa, 1899). The upper reaches of the Inambari and Tambopata rivers appear to have been used by the Incas to some extent (Isbell, 1968; Toledo, 1975, cited in Lyon, 1981). Trading between the highlands and the residents of the lowlands of these two rivers

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during the 16th century may well have followed from trading pattern established by the Incas (ibid.). The Inca Athawallpa Yupanqui is also reported to have organized a large, albeit failed, military expedition that sailed down a portion of the Madre de Dios, and may well have past Ese Eja territory (ibid.). Unlike the neighboring Harakmbut (Gray, 1996) and Tacana (Ottaviano and Ottaviano, 1980) however, Ese Eja oral traditions make no reference to contact with or existence of Inca or Andean peoples.

- European exploration of the Madre de Dios began in the 16th century, in the way of a number of failed expeditions to locate the golden city of "El Paititi". The first to navigate a significant portion of the Madre de Dios river was Diego Alvarez de Maldonado, whose chronicles of his 1569 trip form the earliest written accounts available on Madre de Dios, even though these were only re-discovered much later (Ulloa,1899). Before this time, a group of missionaries from Cusco had established themselves along the Heath river, then known as Samo, among what may have been Ese Eja. This mission, known as San Pablo de Samo, was not continued for long, but Alvarez Maldonado reports encountering a group of natives familiar with these early missionaries (Ulloa, 1899). Moreover, these Indians from the Heath river helped a forerunning contingent from the Maldonado expedition erect a short-lived settlement called Nueva Salamanca on the mouth of the Toromonas, downriver from the Heath river (Aza, 1926). The remnants of the failed expedition returned to Cusco by travelling up the

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Tambopata. Hence, the first expedition into Madre de Dios appears to have had some contact with the Ese Eja.

Many of the gold mining settlements in the eastern flanks of the Andes, including San Juan del Oro, Marcapata, Kosñipata and Paucartambo served as points of entry into Madre de Dios during the colonial years, but the ruggedness of the terrain and reported hostility of the Amerindian population discouraged and aborted several exploration efforts. Most such efforts took place in the northern part of Madre de Dios, closer to Cuzco, following trails and access routes established in pre-Columbian times. A number of gold mining as well as sugar cane and coca-growing settlements were created in the Upper Madre de Dios, reaching as far south as the Inambari river, very close to Ese Eja territory, but most of these- and especially the eastern ones- were short-lived. Aside from some sporadic contacts during the 17th and 18th centuries, the eastern part of Madre de Dios remained essentially uncolonized until the 19th century, largely due to its inaccessibility. This however, does not mean there were no regular contacts between piedmont Amazonians and Europeans. I have already stated above, there was trading between the highlands and lowlands and some early missions were established in Ese Eja territory, though these were not long lasting.

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In contrast to Madre de Dios, the Beni region, in what is now Bolivia, was explored and extensively colonized during the colonial period. Large Jesuit missions were established in the Llanos de Moxos area by the 17th century (Denevan, 1976:211), and served as bases from which to explore, subdue and missionize the indigenous population to the north. By the 18th Century, Franciscan missions at Cavinas, Tumupasa and Ixiamas included large populations of several Tacana-speaking groups, including- most likely- some Ese Eja (Anonymous, 1771). Attacks from Madidi Ese Eja on Tacana and Cavineño missions continued during the 17th and 18th century, most likely in order to obtain steel tools (Armentia, 1887)[9]. The mission of Santiago de Pacazuaras, abandoned in 1840, clearly established contact with a group of Ese Eja, referred to as the Guacanahua (Metraux, 1963).

Although much of Madre de Dios remained essentially unexplored and largely un-colonized up to the 19th century, intermittent contact and trading between the Andean and Amazonian populations did follow along the long and fluctuating frontier of the eastern cordilleras. Axes and knives were traded in exchange for feathers, honey, copal and living animals, among others. These trade routes served as the basis of an important colonization and extractivist effort between 1850 and 1890, based on the extraction of *Cinchona* bark, or "cascarilla" as it

9. These attacks reportedly continued as late as Fawcett's visit to the region (Fawcett, 1911:378).

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was known locally. The demand for the bark of this piedmont species was high due to its use in the treatment of malaria world-wide. A number of well-organized expeditions were carried out in order to identify areas rich in this species and organize the labor and infrastructure for its extraction along the Alto Madre de Dios, Inambari and Tambopata rivers. This period too marks the earliest botanical expeditions in the area, including visits by Weddell, Markham and Raimondi to survey populations of *Cinchona*, as well as the first important missionary presence, this time from Samuel Manicini, a priest from the Beni (Aza, 1926; CORDEMAD, 1986; Wahl, 1987)

In 1896 Faustino Maldonado (not to be confused with Juan Alvarez de Maldonado), was the first European to navigate the entire stretch of the Madre Dios river, past its confluence with the Beni and into the Madeira, surveying *Cinchona*, *Hevea*, and *Castilla* populations and providing the first reliable map of the river since his predecessor's forgotten contribution (Aza, 1926).

In sum, though contacts between the Ese Eja and outsiders, notably explorers, missionaries and some traders, may have begun as early as the 16th century, these contacts were sporadic and included only some- mostly peripheral- Ese Eja populations. Lack of direct contact however does not mean that Ese Eja communities were not indirectly affected by the presence of Europeans in the region. By the onset of the rubber boom for example, parts of the Madre de Dios

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river were already depopulated from its original inhabitants. Epidemics are known to have devastated other parts of Amazonia, well before the arrival of the first Europeans (Denevan, 1976). This in turned opened up vast areas to headwater groups who either migrated down river or exploited seasonally abundant resources, such as river turtle eggs in exposed river sandbars. By the mid-19th century for example, some Ese Eja had settled along the lower Madre de Dios, only to move upriver again as the area became subject to the violent presence of rubber tappers later that century (e.g. Alvarez, 1937). In a similar fashion, Machiguenga from the Urubamba settled in areas of the Upper Madre de Dios, following the population demise of Piro during the 19th century (Johnson, 1978: 25). [10]

Moreover, by the 19th century, Ese Eja had become largely dependent on plantains (*Musa X paradisiaca* L., Musaceae) as a staple, a cultigen introduced by Europeans in the 16th century[11]. The low labor requirements and high caloric returns of plantain agriculture make it an ideal complement to the highly mobile hunter-gathering based lifestyle that characterized the Ese Eja during the period between colonization of the Amazon and actual direct contact with Europeans. Hence, by the time relations between the Ese Eja and Europeans intensified,

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10. Similar directional movements in order to occupy territories vacated through withdrawal or demise of pervious occupants have been noted elsewhere (Chagnon, 1968; Hames, 1983).

11. For historical evidence suggesting a pre-Columbian diffusion of bananas in the Americas see Stover and Simmonds, (1987:167-168).

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Ese Eja subsistence and settlement patterns had already undergone important changes. Furthermore, it is likely that epidemics affected the Ese Eja in pre-contact times, as they did among many other indigenous groups, though there is no direct evidence to this effect. Large-scale epidemics among the Ese Eja certainly occurred later, following the first attempts at sedentization by Dominicans in the 20th century.

The 20th Century and the sedentization of the Ese Eja

By the end of the 19th century, the vast reserves of high-grade rubber[12] in Madre de Dios were being approached by Peruvian tappers from the northern departments of Loreto and Ucayali, by Bolivians travelling up the Beni and by Brazilians from Acre. This convergence of different private and national interests eventually led to a number of territorial disputes, as well as re-mapping of boundaries (e.g. Suarez, 1928). The discovery of a passage connecting the Ucayali drainage basin with the Madre de Dios through the Ithsmus of Fitzcarrald in 1894 (Aza, 1926) marked an important stage in the opening of Madre de Dios to the international market economy, as it allowed for the direct import and export

12. Rubber is obtained from two different species, "caucho", *Castilla ulei* Warb., Moraceae, and "goma", *Hevea brasiliensis* (A.Juss.) Muell.-Arg., Euphorbiaceae. Whereas the former, providing a lower-grade latex is destructively harvested by cutting the trees down, the latter involves tapping the latex from trees by making a series of incisions (Cariat, 1912).

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of rubber, avoiding the long and hazardous journey across the Madeira rapids. Still, the costs and hazards associated with transporting rubber through the ithsmus or its alternative, the Madeira, curtailed the scale and impact of the rubber boom in Madre de Dios, at least in comparison to that of other parts of Peru, Ecuador, Colombia and Bolivia.

During the early 1900's, efforts were directed at improving direct communications between Madre de Dios and the outside, in order to facilitate the export of rubber. A number of exploratory surveys and feasibility studies identified the Tambopata as the best access route, due to its navigability (e.g. Carbajal, 1908). After this, rubber was taken by boat to the highest navigable point in the Tambopata, Puerto Markham or Astillero, and from there taken by mule. From the railway stop at Tirapata, Puno, there was a two-week overland trip by mule to the uppermost navigable point, Astillero, on the Tambopata river. This was followed by a three-day descent by canoe to Puerto Maldonado (Portillo, 1914). The mule track to Astillero built by Inca Mining Co. and Inca Rubber Co, which included a river crossing at Candamo, crossed Ese Eja territory. Although rubber continued to be taken out to the Ucayali through the Ithsmus of Fitzcarrald in Manu and through the railway in Porto Velho, the Tirapata-Astillero route became the major access route for manufactured goods, people and eventually services such as mail and telegraph. The transformation of the Tambopata into a major axis of communication and trade between Madre de

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Dios and the outside world, had profound impact on the surrounding indigenous populations, particularly the Bawaja Ese Eja.

The rubber boom in Madre de Dios, albeit it's relatively attenuated condition and short duration compared to other regions, signaled the beginning of widespread direct and violent contact between indigenous societies in the region and the state. The rubber boom had even more pronounced impact on northern Bolivia, where Nicolás Suarez built an extensive empire that was to survive the collapse of the rubber boom, leaving social and economic structures which remain visible to this day (Fifer, 1970). Shortage of labor presented a critical problem to rubber barons, particularly as many indigenous groups had suffered massive demographic collapses through epidemics or had escaped to the inaccessible headwater regions (Barriales, 1973). Large parties, referred to as "correrías" were organized to comb through areas of forest, capturing people who were then brought to rubber tapping camps as forced or indentured labor, or sold. This period marked a phase of intense inter and intra-tribal war as some indigenous groups crossed into neighboring territories seeking to escape the "correrías" (Nordenskiöld, 1906:529). Moreover, many groups retreated to the more isolated headwaters (Alvarez, 1937).

Through the use of highly valued manufactured objects such as guns and axes, rubber tappers encouraged inter-tribal raids as an additional means of obtaining

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labor (e.g. Aza, 1930; Maticorena, 1902). Such raids inevitably produced retaliatory killings leading to further dislocation and war. Inter and intra-tribal kidnapping was also rampant at this time, possibly as a response to the devastating effects of depopulation, as groups desperately vied to maintain their societies viable.

Epidemics themselves are frequently, particularly during the early stages of contact (Albert, 1988) interpreted as acts of inter or intra tribal sorcery, which led to retaliatory spirals of violence. Some Sonene Ese Eja for example, continue to accuse the Bawaja Ese Eja for a wave of measles epidemics that occurred in the 40's. Groups like the Arasaeri and Toyoeri were practically driven to extinction during this time, large numbers being taken and sold as slaves in Riberalta (Fernandez, 1952; Wahl, 1987). Large numbers of Ese Eja were reportedly also enslaved and sold in Riberalta.

While some Ese Eja families settled around important centers of trade or travel, such as Astillero, others moved to the more remote headwater regions. By the early 1900's the Ese Eja population living along the Tambopata river were described by a government surveying commission as "docile, tamed and nearly civilized" (Maticorena, 1902:137). Population estimates at this time were of 400-500 Ese Eja along the Tambopata river alone. The two largest known population nuclei at this time were Puerto Markham (Astillero), the highest navigable point

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on the Tambopata linking Puerto Maldonado to the mule track to Tirapata, and the mouth of the Malinowski (***Nao'o***). These Ese Eja maintained extensive trade relations, supplying labor, fuel-wood, meat and agricultural products to the steamboats connecting Puerto Markham with Puerto Maldonado (Fernandez, 1952; Hassel, 1905).

Other Bawaja Ese Eja living in tributaries such as the Tavara, Malinowski and La Torre, had no direct contact with the state or colonists, and were feared for their bellicose resistance. Likewise, though to a smaller extent and at a later point in history, the Ese Eja on the Heath river consisted of two separate and rival groups. One, established close to the mouth of the river, maintained more contact with the Dominican mission at Lago Valencia, while a second group in the headwaters remained isolated until their contact and incorporation into the mission in 1932 (Alvarez, 1926, 1950; Fernandez, 1952)[13].

Both strategies, contact and incorporation versus isolation and resistance, posed their own threats to the integrity and viability of the Ese Eja. While contact often implied violent submission and greater exposure to epidemics, retreat to the isolated headwaters exposed groups to tribal raids and rendered access to highly desirable manufactured goods very difficult. Some, Bawaja Ese Eja

13. Metraux (1963), most likely based on accounts by Fawcett, names these Guarayo and Echoja respectively.

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particularly, seem to have fluctuated between both strategies. Moreover, the highly mobile lifestyle, characterized by small bands of hunter-gatherers using wild resources dispersed over a wide area, may well have been an adaptation to the social environment of the time, in which trading was interspersed with raids and war.

In any event, the more intense presence of the rubber boom in the Tambopata and Beni river signified that those Ese Eja groups became sedentized much earlier than the groups of the upper Madidi and Heath rivers.

In addition to the massive disruption of indigenous territories and populations, the rubber boom also brought an infusion of labor from other parts of Amazonia and the world[14]. Japanese migrants arrived into Beni and Madre de Dios at this time, often as merchants and river captains. In addition, labor from other parts of the country and Amazonia were also brought in. Quichuaruna, Huitoto, Bora, Cocama, Shipibo, Amahuaca, Yanesha, Ashaninka, Piro, Tacana and many others were brought from as far north as Ecuador to as far south as Santa Cruz, Bolivia, to work in the forests and rivers of Madre de Dios and Beni (d'Ans et al., 1973, CORDEMAD, 1986).

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14. See Yungjohann (1989) for a powerful first-hand account of the life of a rubber tapper at the turn of the century.

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"Barracas", small hacienda-style settlements out of which rubber-tapping operations were run, became important centers for the incorporation of Ese Eja into the market economy. Moreover, just as the Jesuit missions did during the 17th century, rubber boom "barracas" created the physical medium and cultural mix that precipitated the creation of an Amazonian hybrid culture. This emerging culture included a rich repertoire of oral traditions and ethnobiological knowledge from diverse and distinct parts of Amazonia. As we shall see throughout this thesis, even though only a fraction of the Ese Eja participated directly in this process, the rubber boom marked the beginning of an important process of exchange of cultural knowledge between Amazonians that continued after the collapse of the rubber boom.

The collapse of the rubber boom in the early 1900's eliminated the same economic incentives which had devastated the indigenous population of the region, and the region entered a period of economic and demographic decline (Fernandez, 1952). This period of renewed isolation and relative inactivity lasted until the second world war, when demand for rubber increased temporarily again.

The economic slack during this time was only partly taken up by the emergence of two other economic extractive activities, Brazil nuts (*Bertholletia excelsa* Humb. & Bonpl., Lecythidaceae) and hunting of wild skins, including white-lipped peccary (*Tayasu pecari*), collared peccary (*T. tajacu*), red brocket deer (*Mazama*

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americana), wild cats (*Panthera onca* and *Felis pardalis* in particular), giant river otter (*Pteronura brasiliensis*) and black caiman (*Melanosuchus niger*). Both of these industries grew out of the rubber industry in that they were often capitalized by the same companies and individuals, utilizing the infrastructure and labor brought in during the rubber boom. Nicolás Suarez in particular, maintained his control over the system of "barracas" in the Beni, and was able to maintain his monopoly until his death in the 1950's (Fifer, 1970).

The 1900's also marked the beginning of a comprehensive missionization in Madre de Dios, following the creation of a Vicariate for Madre de Dios and Urubamba by the Spanish Dominican order (Fernandez, 1952). Missionization of the Ese Eja, Toyeri and Iñapari in Madre de Dios began in 1910, but took place principally between the 20's and 30's, coinciding with the sequential construction of missionary centers of San Jacinto in Puerto Maldonado (1910), Lago Valencia on the Madre de Dios river (1930-1944), and El Pilar (1937) (Rummenhoeller and Lazarte, 1990).

Although the missions of San Jacinto and in El Pilar included Ese Eja among their populations, Lago Valencia was the main missionary center for the Ese Eja. Its dismantling in the 1940's marked a re-direction of Dominican efforts towards the "Mashcos" or Arakmbut, leading to the creation of the mission of Caichihue

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(1944-1948) and subsequently Shintuya (1957-present) on the Upper Madre de Dios (Rummenhoeller and Lazarte, 1990).

During the first half of the 20th century then, Dominican missions in Peru and the "barracas" in Bolivia became important mechanisms to sedentize Ese Eja groups still living in the headwaters of the Madidi and Heath rivers, as well as on the tributaries of the Tambopata. This in turn followed from the ever-present demand for manufactured goods and the decreased threat from outsiders following collapse of the rubber boom.

The frequency of inter- and intra- tribal physical conflicts decreased after the 1920's, due to the combined reduction in pressure from colonists and the gradual sedentization of most Ese Eja by missionaries. Even so, sporadic outbursts of violence followed by brief retreats to the headwaters punctuated the gradual intensification of relations between the Ese Eja and external agents, including missionaries, "patrones" and traders. For example, in the 1940's a Sonene Ese Eja murdered a Peruvian in Lago Valencia, reportedly due to a conflict over fishing rights. Fear of retaliation lead to a massive exodus from the area, with different Ese Eja groups dispersing into the Asunta, Madidi and Heath rivers. A splinter group of those that went to Madidi eventually migrated to the Beni river, eventually settling in Portachuelo Alto in the 1960's.

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The Ese Eja who decided to live in these centers did more than just develop profound relations of economic and material dependence with external markets and actors. Barracas, and to a lesser extent Dominican missions, served as a critical nexus of contact with the outside world and other indigenous and non-indigenous knowledge systems. It is around this time when the Sonene Ese Eja claim to have first experienced drinking the hallucinogenic ayahuasca for example. Many cultigens, including rice, sugar cane, squash, water melon, and citrus fruits were incorporated into the Ese Eja ethnobotanical repertoire at this time (Fernandez, 1937).

On the lower Heath, a "patrón" (landownder and estate holder) engaged the Sonene Ese Eja in a number of extractivist activities, namely Brazil nut harvesting as well as rubber and gum tappping. In Section IV, I will also explore the possibility that considerable ethnomedical and ethnobotanical knowledge was incorporated at this time. As was the case in the rubber boom, barracas and missions facilitated direct contact and exchange between the Ese Eja and other indigenous groups, including Toyeri, Iñapari, Kichwaruna and Ribereños from other parts of the Amazon (Anonymous, 1936). Ese Eja boys and girls were also taken to Dominican schools in Quillabamba and Puerto Maldonado respectively, where they were raised and educated among other indigenous groups from Madre de Dios and the Urubamba (Esparza, 1941). Frequently,

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these Ese Eja returned to their communities as young adults, bringing with them a mix of Christian and pan-Amazonian ideas.

These events in turn catalyzed the creation of a new identity, based on a reconstructed meaning of Ese Eja. Individuals raised in missions and "barracas" gained a basic understanding of the national culture, language and political apparatus, subsequently becoming intermediaries between Ese Eja communities and external agents.

The period of sedentization in the early decades of the 20th century also marked a series of epidemics that devastated the Ese Eja population, leading to a repeated, albeit temporary, attempts to dissociate from contact and retreat to the headwaters. There are no precise figures indicating the numbers of people that died during these years. The Dominicans were not eager to publicize these figures in their newsletter "Misiones Dominicas del Perú", which was distributed to their supporters in order to raise funds, though several writings do refer to such incidents and to the mixed reactions they evoked among missionaries (e.g. Alvarez, 1936, 1938). Reports among neighboring Harakmbut document devastating epidemic outbreaks. In the 1940's for example, 80% of the Wachipaeri are estimated to have died from smallpox (Moore, 1980). Groups such as the Toyeri, Iñapari, and Sapiteri were also literally driven to extinction.

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By 1905, there were reportedly at least 1000 Ese Eja on just two of the Tambopata tributaries: the Malinowsky and La Torre tributaries of the Tambopata (Metraux, 1963). A few years earlier, Maticorena (1902) estimated there were about 400 Ese Eja on the Tambopata river itself. These figures would not include Ese Eja living on other tributaries of the Tambopata, such as the Chuncho and Tavar. In any event, the entire Bawaja Ese Eja population today, after 30 years of demographic recovery, numbers about 200, a fifth of that reported by von Hassel for just two tributaries early in the century.

These figures are even more dramatic when one considers that the populations mentioned by von Hassel had already sustained several years of prolonged, violent, contact with rubber tappers and merchants in the area, and thus were very likely to have already suffered marked decline in numbers. Hassel (1905:32) estimated there were 3,000 Ese Eja in Peru and Bolivia, though he does not identify sources. Figures of 15,000 Ese Eja in 1948 for Peru alone are clearly exaggerated (del Rio, 1960, cited in Shoemaker et al., 1975).

World War II brought a brief economic boom to Madre de Dios and Beni, fueled by a renewed demand for rubber. This period also marked the beginning of improved aerial and subsequently road communications (Fifer, 1970), though it was not until 1965 that a road was built linking Madre de Dios to the rest of Peru (CORDEMAD, 1986). By the late 1940's missionizing efforts among the Ese Eja

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began to decline. The central Ese Eja mission of Lago Valencia was closed in 1943 (Fernandez, 1952: 668), and for the next decades, the Ese Eja either dispersed along the rivers or settled in with "patrones" in "barracas" or "fundos" (e.g. Gonzales del Río, 1953). One group settled on the pampas along the Heath river, along the cattle route between Ixiamas and Puerto Maldonado.

As in the previous decades, family groups frequently moved, joining and fissioning according to idiosyncratic configurations of social and market relations. These movements seem to have reflected a constant flux, an internal tension, between the need for manufactured objects and the risks of epidemics, and the risk of social conflict and exploitation that the sedentary lifestyle inevitably entailed.

The 1940's also marked the arrival of evangelical missions in Bolivia, which began to group and sedentize in Rurrenabaque the scattered groups of Ese Eja living along the upper Beni. In the 1960's this effort intensified with the presence of Summer Institute of Linguistics (SIL) and the establishment of a mission base in the Ese Eja community of Portachuelo on the lower Beni. Portachuelo grew rapidly in the 1970's and 80's, grouping many of the Madidi Ese Eja, most of whom by then had already settled in "barracas" along the Beni. Indeed, today there are actually no Ese Eja on the Madidi river. Following the departure of

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New Tribes missionaries from Rurrenabaque in the 60's, the Ese Eja either dispersed around Rurrenabaque or moved down to SIL mission in Portachuelo.

Evangelist missionaries have had minimal impact upon Peruvian Ese Eja. The Summer Institute of Linguistics brief presence in Madre de Dios was restricted to the Piro, Machiguenga and the Harakmbut west of the Ese Eja (Rummenhoeller and Lazarte, 1990). The history of contact and sedentization of the Bolivian and Peruvian Ese Eja are thus different in that whereas the former were originally sedentized in barracas and then missionized, the latter were first missionized and subsequently moved into "barraca"-style settlements or small communities.

Differences in the political and socio-economic settings of Bolivian and Peruvian Ese Eja became even more marked in the late 60's, when the Peruvian military government of Velasco passed a series of land reform measures and, more significantly, a law which explicitly gave land rights to indigenous peoples. Starting in the early 70's and continuing to this day, dispersed native families began to re-group and claim territories, which are known as "Comunidad Nativa" or "native community". While the law was important in recognizing land rights, the allotment of land was largely based on Andean, ecologically and socially inappropriate, concepts of land utilization and subsistence. As a result, many territories are not large enough to support resource needs, particularly in the face

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of demographic recovery and the increasing pressures on resource bases following insertion into the market economy.

In any event, the "Ley de Comunidades Nativas" together with the land reform agency, SINAMOS, were instrumental in grouping the Ese Eja into defined and demarcated territories, which in turn attracted centralized government services, including schools, health care centers, etc. This period marked the beginning of a broader and more intense integration of the Ese Eja into the State, including demands that Ese Eja serve in the military and obtain the necessary legal documents. It also led to the creation of political structures within communities which enabled the direct interface with the state. Official titles such as "president", "vice-president" and "treasurer" had profound effects in the social and political organization of the Ese Eja, and marked profound changes in community dynamics and the relationships between genders and generations. These changes have in turn profound impacts in ethnobotanical processes, as I will illustrate throughout the subsequent sections.

In contrast, land reform in Bolivia never reached the tropical lowlands, and the economic and socio-political structures and relations in the rural areas today are very similar to those of the turn of the century. This is especially the case in north Beni and Pando, where geographic isolation and the inability of the State to fill the vacuum left by the collapse of the House of Suarez, left a system of

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isolated barracas run by small-scale entrepreneurs or by self-organized peasantry.

The construction of the road Cusco-Puerto Maldonado in 1965 opened Madre de Dios to logging, which until then had taken place at very low intensity, and subsequently to gold mining. A major gold boom began in Madre de Dios in the 1970's, peaking in the 1980's and continuing to this day, becoming the principal economic activity in the region. Since the 1970's Madre de Dios has witnessed a growing surge of colonization from Andean landless peasants and gold miners, a process that was further exacerbated during the 1980's by violent strife and economic desperation. This in turn has had important cultural and environmental repercussions at a regional level, and has led to increased conflicts over land between indigenous peoples and colonists (see for example, Gray, 1986).

The 1970's also marked the beginning of oil exploration in Madre de Dios, culminating in the signing of large exploration concessions to Shell and then Mobil in the 80's and 90's. One of these concessions, currently at the exploratory phase, overlaps the headwater regions of the Tambopata, most notably on the Tabar, inhabited by the Ese Eja until the 1940's.

In contrast, the lowlands of northern Beni and Pano have not been subjected to the profound economic and social changes that Madre de Dios witnessed in the

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70's and 80's. Instead, there has been a growing migration of the Amazonian population away from the barracas to urban centers. The lack of legal mechanisms to guarantee access to land has created increasing tension in the lowlands, catalyzing notable political processes among the indigenous groups of the region and the rise of indigenous federations in the 80's.

Thus, again, the histories of north Beni-Pando and Madre de Dios are in some senses reversed. Whereas the former was colonized and developed much earlier, and underwent a significant economic changes in the 18th and 19th centuries, the region became increasingly isolated economically in the 20th century. In contrast, Madre de Dios remained as the last wild frontier of Peru, with massive colonization beginning as late as the 1970's, but achieving significant proportions. While Madre de Dios has attracted a considerable amount of attention, including colonization, development of gold and oil prospecting and more recently rapidly growing ecotourism, research and conservation efforts, the lowlands of north Beni and Pando remain the quiet backwaters of the Bolivian tropics.

The 1980's saw the surge of indigenous political institutions in both Madre de Dios and Beni-Pando, with the creation of the FENAMAD (Federación Nativa del Rio Madre de Dios) in 1982 (Anonymous, 1982), and of the CIRABO (Central Indigena de la Amazonía Boliviana) in 1991 (CIRABO, 1994). These federations

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created a new arena for inter-tribal relations and have been successful in facilitating contact with governmental and non-governmental agencies, attracting political and economic resources and projecting indigenous agendas to national and international arenas.

Unlike other regions of the Peruvian Amazon, Madre de Dios was never subject to insurgency-related violence. In fact, this department remained as a fairly quite political backwater during the agitated 1980's and early 1990's.

Language

Earlier, I described the linguistic affiliation of the Ese Eja, and the internal subdivision into three dialects: Bawaja, Sonene and Madidi. These dialects also correspond to Ese Eja notions of intra-ethnic affiliation. The Bawaja (Tambopata) Ese Eja and Sonene Ese Eja, differ in the use of two phonemes

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Bawaja Ese Eja	Palma Real or Sonene Ese Eja
[ts] ----------→	[t]
[t] ----------→	[k]

(source: Chavarría, 1996:45)

Of the three dialects, Bawaja Ese Eja is the most distinct, and based on linguistic evidence, probably the most archaic (Chavarría, 1994). The Bawaja living in the Tambopata river are also the group most isolated from the other Ese Eja communities, and most intensely in contact with markets and the national society. Ese Eja language is rarely spoken here, and is in the process of becoming lost.

Some of the morphological and structural characteristics of Ese Eja language have important ethnobotanical ramifications. As an agglutinating language[15], Ese Eja lends itself to a remarkable degree of linguistic creativity and spontaneous word-construction. This in turn may explain in part the facility with which Ese Eja name "new" items they encounter, be it a tool or a plant. Interestingly, once the logic behind the naming process is adopted, it is possible

15. An agglutinating language is one in which various affixes may be added to the stem of a word to add to its meaning or to show its grammatical function (Richards et al., 1988).

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to "invent" names which are immediately understood by other speakers. Thus there is often a fairly high concordance in the "name", or at least range of names, given by different speakers to "new" objects, whether they be manufactured objects or natural objects: that is, there appears to be a series of basic rules that determine how to name new items.

This logic is based on drawing similarities between the form of the "new" object and a familiar, culturally salient, object. A fork for example, can be ***bia me'***, "spider monkey hand". Alternatively, new nouns are created by transforming the verb associated with its use. A ladder, for example, is ***esoaji***, ("for-climbing"). In this sense, Ese Eja language is well suited to the needs of naming and identifying new plant resources and cultural items as a result of migration downriver and contact with other cultures.

Interestingly, a similar situation has been reported among the Navajo. Morris (1979) notes that "they also never fail to give a name to any specimen shown to them, even it means inventing a new variety", and suggests that the structure of Navajo language lends itself to the construction of elaborate classifications.

Social organization

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The Ese Eja are one of the few societies in Amazonia that combine patrilinearity and uxorilocality. That is, descent is through the paternal line, but husbands move into the wife's household[16] for at least a few years, in an arrangement that approximates bridal service. The Ese Eja are preferentially endogamous, in the sense that they marry within their community and linguistic subgroup. When a suitable wife is not found within the community, men occasionally marry and re-locate in another Ese Eja community. The combination of patrilineality and uxorilocality have important implications for both settlement patterns, gender relations and social and political organization, as men are usually disconnected from their direct kin through uxorilocal residence (Peluso, 1996 preparation). That is, the possibility of establishing political alliances along consanguineal lines is weakened by the dislocation of men from their family groups.

Another characteristic of Ese Eja social organization is the customary adoption of the first two children by the maternal grandparents. Adoptions across other kinship boundaries are also not uncommon, even outside of extended households. When these adopted children grow up, they end up having two "sets" of kin, with effectively expanded options for defining their kinship affiliation to other Ese Eja (Peluso and Boster, 1997). This process is further enhanced by

16. Ese Eja households, known in Spanish as "familia" or "fogón", are quite variable in size and composition. Most households consist of a couple and their unmarried children, both biological and adopted. Occasionally, they include daughters and their spouses as well. Some households may also include a grandparent. Each household cooks separately, but several households may share the same roof. A household functions as a basic social unit within the community.

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the concept of partible parentage, where conception is seen to result from the accumulation of sperm in the woman's womb, frequently of the official parent as well as of extra-marital affairs[17]. The genealogical and social repercussions of this practice are explored by Peluso (1996), who considers the possibility that this system may have developed as an adaptation to the disruption and dislocations produced by contacts and epidemics (Peluso, pers.comm.; Peluso and Boster, 1997).

Ese Eja adoption practices may influence people-plant interactions in a number of ways. For one thing, adoption systems expand the flexibility with which the boundaries of extended families are created, in turn affecting the distribution of knowledge and plant resources within the community (cf. Boster, 1986).

Like many other Amazonian groups, the Ese Eja have an internally highly autonomous, fluid and relatively acephalous political structure. Although each extended family has a head, usually the oldest male, who in some way represents that group and carries most prestige, their capacity to direct or influence others is extremely limited and certainly not a given. At the same time, interaction with the centralized political structures of the State has created political roles which are defined exclusively in terms of their articulation with "the outside". These "official" positions are in turned filled by young men who are

17. The belief in multiple paternity is widespread throughout Amazonia (e.g. Kracke, 1992:140).

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most familiar with national culture and customs. Whereas these community leaders have power in that they serve as bridges to the outside and channel outside resources, their capacity to organize the community internally is often very limited, precisely because of their age and inability to mobilize kinsmen through extensive relationships (Peluso, 1993b).

Additionally, because Ese Eja culture tends to problematize individual accumulation of power and wealth through the disruptive power of envy, expressed through gossip and in some cases even sorcery, men elected to political positions are often those most detached from the complex network and rules of social relations, obligations and exchange. Indeed, it is not uncommon for presidents to be actual outsiders, in the sense of originating from a different community or being Ribereño. Clearly, these individuals will be in an even weaker position internally, since internal power is derived from kinship and economic ties and relationships developed over time. The concomitant internal tension created by this process often blocks attempts by external agents, including national park authorities, conservationists, development workers, and researchers to effectively articulate with the "community". This dynamic, to which many external agents seem oblivious, has important repercussions in ongoing discussions relating to intellectual property rights and negotiations between scientists, ethnobotanists and the representatives of indigenous peoples.

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To a certain extent, the Ese Eja "community", as a political and social unit, is one which responds more to the centripetal forces resulting from external political, social and economic institutions, than to those of internal political and social configurations. Two important traditional means of conflict resolution or expression, fission, migration and in extreme cases, war, are no longer viable options. As a result, mounting tensions are expressed through other culturally available means, including sorcery and gossip. These social dynamics influence individual patterns and charactreristics of resource utilization, including the timing, location and composition of swiddens or the characteristics of broader subsistence strategies.

Ese Eja Communities Today

Today, most of the Ese Eja live in one of seven Ese Eja communities in Peru and Bolivia: Infierno (Tambopata river, Peru), El Pilar and Palma Real (Madre de Dios river, Peru), Sonene (Heath river, Peru), Portachuelo Bajo, Portachuelo Alto and Villanueva (Beni river, Bolivia). An as yet uncensused group of Ese Eja live dispersed along the Beni river close to Rurrenabaque, Bolivia. Some live among the several Tacana communities in the area, including Bala and Capaina.

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Others subsist rather opportunistically, occasionally seeking short-term employment in San Buenaventura and Rurrenabaque and setting up temporary camps along the Beni river during the dry months, fishing and hunting. The Ese Eja who previously inhabited the communities of Barracón, Fortaleza, Peña Amarilla, Fortín and others, on the Beni and Madidi rivers, have all moved away. Most of these are currently living in Portachuelo and Villanueva. According to the Ese Eja, there are no Ese Eja currently living on the Madidi river itself. I now provide brief descriptions of the characteristics and history of each currently inhabited Ese Eja community.

Infierno

The community of Infierno is located on the Tambopata river, about 40km upriver from its confluence with the Madre de Dios in Puerto Maldonado, at about 230m above sea level. Infierno received legal title to 9, 558 hectares and legal status as "native community", in 1976 (García and Gálvez, 1994). At the time, the community grouped together Bawaja Ese Eja who were living in several dispersed settlements, including Chonta and Hermosa Grande, as well as Ribereños and families of mixed indigenous and Andean descent living in the area. The latter group includes Tacana, Cocama and Kichwaruna. Over the next years, the community accepted several families of Andean colonists. By

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1993, only about half of the population of 370 people were Ese Eja (Chavarría and García, 1993).

The high number of non-Ese Eja families, frequent intermarriages between Ese Eja and non Ese Eja, and the proximity to Puerto Maldonado, mean that the Infierno Ese Eja have more contact with "outsiders" or ***deja*** than other Ese Eja. For one thing, Ese Eja language is rarely spoken here, and most Ese Eja children do not speak or understand more than a few words. Due to additional geographical and historical reasons, Infierno has had more intense contacts with the market economy and the nation state than other Ese Eja communities, with the possible exception of El Pilar.

Despite its proximity to Puerto Maldonado, and the fact that that whole sector of the Tambopata river has been extensively colonized over the past decades, game is still relatively abundant, though not as much as in Sonene. The juxtaposition of Infierno to the Bawaja-Sonene national park and the Tambopata Reserved Zone certainly help in this regard.

Most Infierno Ese Eja are subsistence farmers, though in the last years a number of people have become fully or partly employed in tourism or in indigenous and other non-governmental organizations. Commercialization of Brazil nuts and palm thatch provide additional sources of revenue. Moreover, over the past 10

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years, an increasing number of families have built secondary houses in Puerto Maldonado, ostensibly so that their children can attend high school. As Puerto Maldonado continues to grow and means of transportation improve, it is likely that Infierno will develop into an urban satellite.

Since 1988, the community has hosted a FENAMAD[18] health and community center, Centro Ñape. A series of workshops and projects pertaining to health care, community development and conservation have been conducted here over the years, promoting the influx of ethnobotanical information from other parts of the region and the Peruvian Amazon (Alexiades and Lacaze, 1996). More recently, the community embarked on a joint project with a private company to develop a tourism project (Stronza, 1997).

The community can be reached by boat from Puerto Maldonado (5 hours in "peke-peke"). Since the early 90's daily taxi boats travel daily back and forth between Puerto Maldonado and Infierno. A road also links Infierno with Puerto Maldonado, though as of 1996 lack of maintenance still precluded the use of all vehicles but motorbikes. The community has had a school since its inception, and a medical post ("posta medica") since the 1980's, both attended by government employees.

18. Federación Nativa del Rio Madre de Dios y Afluentes, the regional indigenous federation.

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El Pilar

El Pilar, located in the Madre de Dios river, close to Puerto Maldonado, was started by the Dominicans in 1943 (Fernandez, 1952). It was originally intended to fill in the vacuum left by the closure of the mission at Lago Valencia. The community consisted of a mixture of Ese Eja Shipibo-Conibo and other groups, though today only a few families remain. Those families that do remain are closely interdependent on the economy of Puerto Maldonado, combining subsistence agriculture work wage labor.

Palma Real

Palma Real is also located on the Madre de Dios river, downriver from Puerto Maldonado, about 20km from the border with Peru and at about 170m above sea level. All transport is by river, the journey to Puerto Maldonado lasting about six hours. A number of Ese Eja families were already established in Palma Real by 1932, and these apparently maintained amicable relations with the mission at Lago Valencia (Fernández, 1932). Some of the Ese Eja living at Lago Valencia moved to Palma Real following the closure of the mission. As a result, Palma Real includes some families originally from the Tambopata river, though most are ***sonené kwiñaji***, from the Heath river. Today the community has about 200

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Ese Eja. Ese Eja is also the first language spoken in the community, though everyone is to some extent bi-lingual.

Palma Real's 9,500 hectares of titled lands juxtapose with the national park Bawaja-Sonene and with the neighboring community of Sonene (García and Gálvez, 1994). Main sources of income are fishing and brazil nut harvesting, both of which are controlled by two powerful families within the community. Young Ese Eja occasionally travel to Puerto Maldonado and beyond, seeking wage labor. The community has a government school and medical post.

Sonene

Located at 140m above sea level, the community of Sonene has legal title to nearly 4,000 hectares, and has a population of 80. Two households have non Ese-Eja males, but the offspring of these homes, like everyone else in Sonene, are bi-lingual.

Sonene is the most isolated of the Ese Eja communities in Peru . A trip to Puerto Maldonado can take anywhere between 8 to 12 hours, depending on the strength of the current. Unlike Infierno and Palma Real, there are no other boats passing by, so that villagers depend on one of the community boats making the trip. The community has a school and since 1995 a medical post as well.

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Its location next to the Bawaja National Park and the absence of any other inhabitants nearby mean that game and fish are relatively abundant. At the same time, the distance to Puerto Maldonado and restrictive logging and hunting renders the participation of the Sonene Ese Eja in the cash economy difficult. Brazil nuts and leaf thatch provide some source of income.

Portachuelo

Portachuelo is located on the Beni river, about 12 hours upriver from Riberalta. Portachuelo is divided into three autonomous yet immediately adjacent communities: Portachuelo Alto, Portachuelo Medio and Portachuelo Bajo. Portachuelo Medio is composed almost entirely of Tacana families, though some Ese Eja have intermarried and settled here. Portachuelo Bajo and Portachuelo Alto, known as the "Bajo" and "Alto" respectively, are almost entirely Ese Eja, though the former has a few intermarried Tacana. Together, Portachuelo Alto and Bajo form the largest Ese Eja settlement, with a population of about 500.

Officially, the community was established in 1953 (CIRABO, 1994), though the Ese Eja claim families have lived here since the 1930's. An evangelist couple from the Summer Institute of Linguistics lived in the community from the 1960's until the 1980's, when they were replaced by two couples from New Tribes

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Mission. Missionaries built an airstrip, church and have worked closely with the Bolivian government to implement a succesful bi-lingual education program and a clinic. The presence of the mission and its services attracted many of the Ese Eja living in "barracas" along the Madidi and Beni in the 1950's and 60's. The Ese Eja in Portachuelo Alto are mostly descendants of Sonene Ese Eja who fled Peru fearing retaliation after a ***deja*** was killed in Lago Valencia earlier this century.

The high population density of Portachuelo means that game is scarce. This is compensated by the rich lacustrine and river protein resources, discussed in chapter 6. Likewise, high pressure on soils is offset by periodic floods, which though quite destructive, replenish the rich alluvial soils. The good quality, well-drained alluvial soils of the *varzea* are ideally suited for plantain agriculture. As a result, plantains are the major staple and cash crop for Portachuelo Ese Eja, particularly in the Bajo.

Villanueva

Villanueva is located next to the Beni river, about three hours upriver from Portachuelo. According to the Ese Eja, Villanueva was established by them in the late 1920's, though written reports suggest a later date: 1954 (CIRABO, 1994). Once larger than Portachuelo, Villlanueva has become dramatically de-

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populated, as most of its inhabitants have moved to Portachuelo Bajo, in order to be closer to centralized missionary and government services. As a result, Villanueva today has a population of about people. The low population and presence of fairly undisturbed forest means that game is much more abundant than in Portachuelo. The community has a school.

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Chapter 5.

Ese Eja Ecology, Economy and Subsistence

Introduction

In chapter 3, I underscored the diversity and variability, spatial and temporal, of Ese Eja plant and animal resources. In chapter 4, I showed how overlying this environmental heterogeneity is a complex history of socioeconomic relations and culture change. This has included population decline, significant dislocations and a net migration downriver, and the development of an increasingly sedentary lifestyle, marked in turn by intensified interactions with regional and global markets and political systems. This chapter brings these two aspects of Ese Eja society and ecology together, by discussing the characteristics of past and present Ese Eja ethnobiological interactions and resource utilization. This in turn sets the general stage for a more detailed investigation into Ese Eja-plant interactions in the context of healing and ethnomedicine.

Hunting

Hunting and Ese Eja society

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The degree to which different Ese Eja communities rely on wild game as a source of protein depends on the availability of this resource. Two poles of a continuum are exemplified by Sonene and Portachuelo. Wild meat is a relatively abundant and critical protein resource in the former, whereas in Portachuelo game has been locally exhausted and hence only rarely consumed. Irrespective of its dietary importance, game and hunting are of immense cultural importance to the Ese Eja.

No other activity is associated with the prestige that hunting affords, even in Portachuelo, which derives most of its protein from fish. As a highly valued item but restricted resource, the distribution of game- like manufactured products- fuels both social relations and social tensions. In Sonene, game is a major factor in the daily quality of life and mood in the village. The general morale declines and tensions mount if days go by with no hunter bringing meat. Conversely, killing a large mammal, such as a tapir, guarantees meat for everyone in the village, creating a sense of excitement and anticipation, surpassed only by success in the ultimate hunting event: the communal hunt of white-lipped peccaries.

In Sonene particularly, there is a considerable social pressure upon the hunter to share the meat with his extended kin, according to quite explicit rules, priorities and protocols. Failure, or perceived failure on behalf of potential recipients, to

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share meat with kin exposes the hunter to accusations of being stingy, ***kia deja tai***, a most reprehensible moral fault.

Aside from being a prized subsistence resource, meat is an excellent commercial resource as it can be easily sold or exchanged for manufactured goods, either fresh or salted. In many ways, meat constitutes the ideal commodity for the Ese Eja, particularly for the younger males who are also the main hunters. Aside from having a steady, almost unlimited demand, meat provides a high return for a low bulk and relatively low labor investment. All of these qualities contrast sharply with most other economic options available to Sonene Ese Eja, particularly for young males who generally have small fields and are reluctant to invest much time in agriculture.

The dual role of meat as a valued subsistence and commercial resource often leads to a conflict of interests among hunters. On one hand, a hunter is bound to an internal system of exchange, which obliges him to distribute the meat within the community. Simultaneously, he is increasingly bound to an external economic system, which places pressure to distribute the meat outside of the community. The conflict between meeting individual social obligations while satisfying material needs is particularly visible in Sonene, where the internal system of economic exchange and reciprocity is still viable. In Infierno, this system of exchange has broken down to a large extent, at least with respect to the sharing of meat, and at least between different households. Hence, the

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unthinkable in Sonene does occur in Infierno: some hunters occasionally sell meat and fish to their neighbors. The transformation of meat from a shared community resource to a market commodity illustrates the changing relationship between the Ese Eja and their natural and social universe.

Hunting is closely associated with male identity and prestige: the mere suggestion of a woman hunter elicits peals of laughter[1]. Young boys make miniature bows and arrows from the outer layer of the stems of *Gynerium sagittatum* (Aublet) P. Beauv., with which they "hunt" lizards and later small birds. The killing of the first game in effect marks entry into adulthood, and male identity continues to be strongly attached to a hunter image throughout the person's life, even if some men rarely actually hunt. Ese Eja men, usually shy and careful not to reveal their emotions in public, become visibly angry and confrontational when park guards or other state representatives attempt to curtail their ability to hunt freely.

Hunting, and the exchange of meat are underscored by sexual symbolism. The Ese Eja creation myth begins with the account of two brothers, and of the tensions created by one brother giving the meat from his hunts to his lover, ***bewihaha*** (sloth), instead of his wife (Chavarría, 1996). The symbolic exchange of meat for sex, and the sexual connotations of hunting and sharing meat have

1. There are isolated instances of women killing game, though these are rather exceptional. The times women do hunt involve the use of machetes, clubs or dogs, but never guns. As a result, if and when it occurs, female hunting is restricted to small game.

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also been underscored by several authors among other groups (Kennsinger, 1995; Siskind, 1973). The relationship between the sexual symbolism of hunting and meat and ethnomedicine is discussed in chapter 6.

Hunting technology and knowledge

Until recently, the main hunting weapon was the bow and arrow (***ekowiji***). Bows and arrow tips are carved from the wood of ***mae,*** *Bactris gasipaes* Kunth or *B. macana* (Mart.) Pittier. Arrow shafts are made with flowering stalks of ***wesa***, a cultivated variety of *Gynerium sagittatum*. The stems are dried in the sun and then carefully tempered and straightened in a hearth. Feathered arrows are used in warfare and hunting, and non-feathered ones for fishing. Fishing arrows tend to be shorter than hunting arrows, perhaps because they are shot at closer range. Arrow tips vary in size and shape, depending on their use. Arrow tips for fishing and small to medium-sized game are made from *Bactris*. Arrow tips for large game and warfare are made with of one of several types of cultivated and wild bamboo, ***saki*** (*Bambusa spp.*).

The Ese Eja report to have never used hunting poisons as such, though they claim several of the cultivated bamboo varieties used as tips to be poisonous. Unfortunately, many of these varieties have been lost, though stands of them can reportedly still be found in old village sites. Bows are typically between 1.80 to 2 meters long, the arrows being a little shorter. Today, bow and arrows are only

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rarely used for hunting, and then only when cartridges are not available. Hunting bows have been replaced almost entirely by 22 mm. rifles and 12-gauge or 16-gauge shotguns. Bows and arrows are still used for fishing however (see below).

The use of several types of animal traps has also been discontinued, perhaps because higher returns are obtained from hunting with firearms. These included carefully concealed deep trenches, ***weja***, of different sizes, which are used to catch a wide range of animals, including land turtles and tapirs. ***Akwi chaa*** involved suspending a heavy log above animal trails, attached to a trip release mechanism. Today, snares and gun traps are used to kill medium prey such as paca, ***se'ao,*** or armadillos. Armadillos are also dug or smoked out of their burrows and clubbed to death.

Hunters frequently employ dogs to find, slow down, or flush out game from vegetation thickets and ground burrows. Good hunting dogs are valued, though most do not live very long: deaths from snakebite or from hunting injuries are fairly common.

Much game is hunted during chance encounters. Ese Eja men usually carry their guns with them wherever they go. Young and adult alike are always aware of the broader surroundings, looking, listening and smelling for signs of game.

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Hunting is usually a solitary activity, though kinsmen- father and son or brother in laws particularly, may occasionally hunt in groups of two or three. Hunters employ a wide range of tactics and techniques depending on the season, time of the day, prey and other factors. Often, the hunter leaves before dawn, heading in a particular direction, listening and watching for any signs of game. The period immediately after a rain is valued, as many animals are active feeding. Furthermore, animals leave good tracks on the wet ground, allowing hunters to pursue their prey over considerable distances. In the height of the dry season on the other hand, when forest pools and swamps dry out, tapirs travel to exposed river banks to bathe, where they may be shot. Night hunting is also practiced in dark moonless nights. Animals are stunned with a flashlight and shot.

An intimate knowledge of animal behavior and ecology, combined with extraordinary skills at inferring information from tracks and signs, is used to increase the odds of encountering, silently approaching and killing the animal (cf. Carneiro, 1970). Hunters rely on detailed knowledge on the dietary habits of game. Deer for example, are known to be attracted to fresh vegetation growth in new swiddens, while paca and brown agouti feed on cultivated manioc. One hunter in Sonene would hunt along a recently abandoned logging road, looking for tapirs grazing on *Cecropia* seedlings. Many forest plants are unnamed and ethnobotanically insignificant, other than for the fact that they are known as food to specific herbivores and frugivores. Certain trees in particular attract a wide range of prey when fruiting. These include legumes such as *Lecointea peruviana*

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Standl. ex J. F. Macbr. (***shawe tojo***) and *Inga* (***naha***), as well as several genera of Moraceae (e.g. *Ficus*, *Perebea*, *Pseudolmedia*). An Ese Eja may have noticed a fruiting tree days earlier, or he may hear the loud calls of birds eating the fruits from a distance.

The location of clay licks (***me'***), which are visited by a wide range of herbivores including agoutis and howler monkeys, are well known and valued as hunting sites. Hunters may either approach the lick quietly or await atop the branch of a tree nearby. Clay licks are often flooded during the rainy season, and hence only visited by animals during the dry season.

Several game species, notably howler and spider monkeys, can also be called in by imitating their territorial call, at least on certain occasions. Hunters also imitate the calls of birds and other animals, even if these are not considered game.

Dreams and hunting are strongly related. Specific dreams are interpreted as omens of either successful or unsuccessful hunting outcomes. Hence, it is common for a hunter to change his plans entirely according to his dreams. Dreams are interpreted according to a logic of symbolic correspondences. Dreaming with the anaconda (***sa'ona***) for example, is interpreted as a sign of likely encounter with deer, ***dokwey***, while dreaming with a black cayman (***shai'jame***) is a sign of encounter with a tapir, ***shawe***. Dreams and the waking

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world maintain a sort of inverse logic in the meanings that are projected onto different animals. This logic becomes clear once the mythical identity and relationship between animals is understood. The aforementioned black cayman for example is an animal closely associated to the ***ena'edosikiana***, the "custodian" spirits of the water world. Its analog on land, the forest, is ***edóskiana,*** whose "pet" animal is the tapir (see chapter 6).

A number of plant and animal substances are used to increase "luck" in encountering game. The hunter carries with him the charm during the hunt, and different charms are used for different species of prey. Another group of charms are used to improve hunting skill, or more specifically to imbue the hunter with a number of abilities subsumed under the adjective ***niñe***. While strictly speaking ***niñe*** refers to aim, more generally it also refers to the hunting spirit, to the determination, keen sense of awareness and perception that allows the hunter and hunting dogs to find, stalk and kill their prey. The converse state, ***niñe ma'*** is associated with poor hunting skills and aim, laziness and with lack of stamina and courage. Medicinals are important resources in helping hunters and their dogs retain the state ***kia niñe***. Frequently, these plants have pungent or turpentine odors, and hence include many Monimiaceae and Piperaceae, though several genera of the Araceae are also quite important. The now abandoned practice among adult males of piercing their nasal septum with the shell of a mollusk, ***bejo***, was also associated with developing good hunting skills.

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Hunting *ño', the* white-lipped peccary

The white-lipped peccary or *ño'* (*Tayassu pecari*), has unique cultural importance for the Ese Eja: not only is the meat highly valued for its taste, but the animal and the hunt are imbued with unique symbolic meaning. It also seems that in the past, peccary herds were more abundant, and constituted a critical protein source for the Ese Eja. Herds of white-lipped peccaries, often totaling several hundred animals, are believed to be ***emanokwana***, the dead. "Clothed" in the body of peccaries, the souls of dead ancestors come to the earth from their land, ***kweyhana***, in order to feed on the fruits of forest plants. Upon killing the animal, the soul immediately returns to ***kweyhana*** unharmed, returning again at a later time as a white-lipped peccary. White-lipped peccaries then, represent the intrinsic capacity of the ***eshawa***, or spirits, to recreate themselves *ad infinitum*, an aspect which is further discussed in chapter 6.

Through his connection to the world of spirits, the ***eyámikekwa*** or Ese Eja shaman, announces where and when the herds of ***ño'*** are to be found. During the rituals of ***eshasha-powi***, and ***epowi sese***, the souls of the ancestors are invited to drink plantain beer, ***epowi***. These rituals, discussed in further detail in chapter 6, serve to establish relationships of reciprocity that ensure subsequent visits of the ***eshawa***, in the form of ***ño'***. Hunting, and white-lipped peccaries in particular, are thus central concerns of ***eyámikekwa*** shamanism.

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When an Ese Eja finds signs of a herd of ***ño'***, he quickly returns to inform the rest of the village. The news triggers a small commotion and considerable excitement. If the tracks are fresh, the men quickly group, either that day or early the next day if it is late in the afternoon, and set pursuit. The ***ño'*** hunt is the only communal hunt. Once found, large numbers of peccaries may be killed, providing a substantial extensive supply of meat for the village.

Hunters usually return from a peccary hunt late in the evening. As the hunters sit around, with the village excitedly pointing and talking about the sizes and genders of the dead animals, the ***eyamikekwa*** arrives and starts addressing aloud each of the dead animals. During this "conversation", the eyámikekwa learns the "true" Ese Eja identity of each ***ño'***. Frequently, the ***eshawa*** of the hunted animals are those of a deceased relative from someone in the community. There are no restrictions at all concerning who eats the meat, as the corpses, or ***eyami***, are simply considered to be an exterior, and in many ways a "gift" of the visiting ***emánokwana*** (see chapter 6).

Oral accounts indicate that in the past, the Ese Eja spent a considerable amount of time, days and even wees at a time, pursuing of peccary herds[2]. Today, peccary herds are much scarcer, a trend which is explicitly linked, by young and old alike, to the disappearance of the ***eyámikekwa*** system of shamanism. That

2. These hunts were not only motivated by subsistence needs. Earlier in the century, there was a high demand for wild skins, and commercial hunting was an essential means for obtaining guns, tools and other highly esteemed manufactured goods.

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is, for the Ese Eja, the decline of peccary herds is not directly due to over-hunting, for as I have reiterated, the essential quality of peccaries, as embodied ***eshawa***, is endless replication. Rather, the disappearance of large peccary herds is attributed to the weakening of the links, social relations, between the Ese Eja and the ***emánokwana***. That is, as the Ese Eja become increasingly like ***deja***, and as the last ***eyámikekwa*** die, the rituals that ultimately ensure the visits of ***ño'*** herds are no longer performed. The souls of the ancestors are no longer y the Ese Eja to drink plantain beer and "visit" during the ***emánokwana*** rituals. The disappearance of the large peccary herds, is a powerful metaphor through which the Ese Eja express a fundamental shift in their relationship to nature and to the supernatural forces that ultimately determine the distribution and abundance of natural resources.

Both ***eyámikekwa*** shamanism and the presence of large peccary herds are associated with a time before the Ese Eja became "domesticated" by ***deja***. As the Ese Eja become more like ***deja*** then, new relationships are forged with nature, and these relationships reflect the novel structures of symbolic and material, economic and social, exchange. Hence the decline of the peccary herds, of a hunting and mobile life-style and of ***eyámikekwa*** shamanism, are all interrelated and associated with the transition toward a sedentary, plant-based economic system. In Chapter 7, I examine the role and meaning of ayahuasca and medicinal substances in the context of these changes.

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Fishing

Together with hunting, fishing accounts for most dietary protein in the Ese Eja diet. The net migration of the Ese Eja from the headwaters to the lowlands has made fish a more abundant and seasonally predictable resource, particularly in such large rivers as the Madre de Dios and lower Beni. The ecological importance of fishing for the Ese Eja is further enhanced by the fact that it is practiced by a broader segment of the society than hunting. Unlike hunting, which is performed exclusively by strong and able young men, fishing falls within the domain of a larger segment of the community, including children, women, and older people.

Fish is not valued for its taste as much as game, and is not considered as substantial: as a friend in Portachuelo once remarked with some melancholy "fish...[for eating]...is not like meat", meaning they do not even compare[3]. Perhaps in part because of this, and because most fishing trips will only provide a relatively small catch, the expectations and pressures to share fish beyond the immediate family are not as great as with the hunt of larger vertebrates. Although the nutritional contribution of fish may rival, and frequently exceed, that of meat, fishing does not have the prestige and cultural importance associated with hunting.

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3. In contrast, for many of the Shipibo-Conibo living along the Ucayali river, life without the regular presence of fish in the diet is unthinkable. Likewise, Tukanoans refer to themselves as 'fish people', and fish forms the staple of their diet (Jackson, 1983).

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The characteristics of fishing, in terms of technology, areas exploited and species targeted, vary considerably between different communities and seasons, and according to a number of ecological and economic factors. Before the advent of manufactured hooks, line and fishing nets, fishing relied on several techniques, continued to this day with varying frequency. Traps, ***pako***, are fashioned from an assortment of materials, including *Gynerium sagittatum* (***bekio'bo)*** stems and *Iriartea deltoidea*, ***eki nei***, trunk slats. The traps, about five meters long, are set along streams to catch small though abundant fish. These fast running streams are quite plentiful in the higher elevations where the Ese Eja used to live, and it appears that this fishing technique, now rarely employed, was quite important in the past.

Fish are also speared, either with bow and arrows, ***ekowiji***, or with long spears, ***baapeja***. Spearing is largely restricted to the dry months, when river levels subside, trapping fish in pools, which become translucent as the sediment load settles. Fish can also be speared along the banks of the river channel itself at this time, particularly in bodies of shallow, slow-flowing water. The frugivorous ***sewa*** (*Prochilodus nigricans*, Curimatidae) and the omnivorous ***jawa oshe*** (*Metynnis* sp., *Mylossoma* sp., Serrasalmidae), are some of the surface-swimming fish that are commonly speared with bow and arrow.

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As the water level in small ponds and swamps subsides during the dry season, fish are speared or stunned with one of several fish poisons. These include the vines ***shaka*** (e.g. *Machaerium floribundum* Benth., *Serjania inscripta* Radlk. in Engl.) and ***asa*** [e.g. *Tephrosia sinapou* (Buc'hoz) A. Chevalier], as well as the latex of the tree ***shi'be*** (*Hura crepitans* L.).

The "barbasqueada", ***na'o tajaa***, is always a social event, where several parties, usually families, will travel to a pre-selected locale early in the morning. Sections of the liana are pounded on a log and then vigorously beaten over the water's surface, dispersing the soapy sap into the pond. Within 15-30 minutes, depending on the size of the pond and/or the strength of the poison, fish begin to die. Adults and children scoop the floating dead and dying fish, throwing them to the shore, where another family member stores them in baskets. Larger, stunned, fish may be killed in the water with a machete. The general tone of the event is one of excitement and merriment, as women and children light fires and immediately begin to roast fish and plantains. Fish continue to die for many hours. There is a sequence in the death of different species, as each has a different sensitivity to the poison. On a good day, the fishing party will remain on the pond for several hours, filling all their baskets. Each family takes home the fish it catches, sometimes returning later in the day or early the following day to fill their baskets again.

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Large backwater swamps and ponds are common in the varzea of Portachuelo in the lower Beni. Here, family parties catch vast numbers of fish, spearing them with harpoons or catching them by hand. The men wade up and down the swamp, repeatedly thrusting their harpoons into the water in long, fast, sweeping movements. Women build barriers with the leaves of *Orbygnia*, *Attalea* or some other large palm, trapping the fish on one end of the swamp. Squatting, with their heads and shoulders above the muddy water, they grope around, skillfuly grabbing the fish with their bare hands. Young boys and men walk along the edges of the swamp, carefully removing a layer of fallen leaves and looking for signs of mud fish, which are promptly speared. The productivity of these swamps is quite astounding. Parties may return to the same area for days, gathering sacks-full of a wide range of fish.

The advent of hooks, line and, more recently, fishing nets, has opened up an entirely new range of fishing resources to the Ese Eja, both in terms of species and seasons. Hooks and line are also used in several ways, depending on the state of the river and the species targeted. Small fish are caught by dangling the bait-laden hook and then quickly yanking the fish out as soon as it bites. Rods, crafted from the straight stems of certain, often Annonaceous, treelets are used for smaller fish. A large number of small and medium-sized species are caught with a hand-held line and hook, coiled on a carved flat piece of wood and held with the hand. Common bait includes earthworms and several larvae, including Curculionid palm weevils from the seeds of *Attalea*.

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Small fish may in turn be used as bait for larger carnivorous fish, caught by hand using larger hooks, or by leaving baited lines overnight. Catfish, ***hai***, in particular, once outside of the scope of Ese Eja fishing technology, are know fished regularly during the rainy season, particularly after a storm, when river levels rise and the fish migrate upriver.

Canoe building was learnt by the Ese Eja, directly or indirectly, through their contact with other riverine groups. The areas customarily inhabited by the Ese Eja last century, the mid and upper reaches of rivers, are not navigable. Balsa rafts were used to travel downriver and return trips made by foot. Canoes allowed the exploitation of new ecological niches. Canoes are also used for travel, on extended hunting and fishing trips along the lower and mid- courses of rivers. During these trips, fish and game may be salted.

Large catfish, occasionally weighing up to several hundred pounds, are often sold, not consumed. Nets, available only recently, also allow catching larger loads of fish, which are frequently salted and sold or exchanged for manufactured food products, including sugar, oil and noodles. Ese Eja food regulations restrain people from storing gathered foods, since couples may not have sexual intercourse while harvested foods remain stored, lest they pollute and render the fish, game or fruits pathogenic (see chapter 6). While these

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regulations help ensure food is promptly distributed, they also encourage selling surplus game or fish.

Gathering wild foods

Most Ese Eja have knowledge of a wide range of wild plant and animal food products gathered during forays into the forest. While many of these are gathered opportunistically, as people travel or hunt (cf. Stearman, 1995, for the Yuquí), some trips into the forest are explicitly made with the intention of gathering specific wild foods. This is the case particularly with honey, beetle grubs and some fruits.

Honey

Both stingless and stinging bees produce honey, a highly coveted item. As one might expect, the Ese Eja have an exhaustive taxonomic system for honeybees, as well as for the different materials found within the colony: waxes, foodstuffs and excreta. I have compiled a list of 15 different folk species which produce honey, and there are probably more. Bees are identified by the height, appearance of the nests, the species of host tree, and by the sound and swarming behavior. Bee morphological characteristics are not as important in field identification, as nests are usually high up in the canopy.

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Before the advent of steel axes, honey collectors climbed the trees. Today, honey is usually harvested by felling the tree on which the bees have built their nest. The bees are then stunned with smoke and fire, since although stingless, they do bite. The section of the tree containing the nest is cut out, and honey scooped out into a large receptacle. Some parts of the nest and bee eggs are also edible, and carried off in large sections to eat in the village, or to give away. The wax of several bee species is used in technology, including attaching feathers to arrow stems.

Insects

The dead trunks of all palm trees, including *Ireartea, Euterpe, Mauritia*, and *Jessenia*, all attract palm weevils. Adults burrow into the trunks, laying their eggs in the pithy center. The developing larvae, ***soso***, have a very high fat and protein content (Dufour, 1987; Santos Oliveira et al., 1976) and are valued both as food and medicine. Trees are not cut for the explicit purpose of harvesting the larvae: rather they are felled to obtain construction materials or edible fruits, and their location remembered. A few months later, a trip is made to the felled tree to harvest the beetle grubs. In addition to palm weevils, a number of other larvae and caterpillars are eaten, though these appear to have been a more consistent part of the diet in past times.

Fruits and wild plant foods

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A number of tree species are also highly valued for their fruits, and occasionally trips will be made into the forest specifically in order to collect these. Frequently however, fruits will be encountered during hunting trips or while collecting other forest materials. Harvesters eat as much as they can on site, bringing back any remaining fruits. Fruit-gathering trips, frequently led by women, will also include a large group of teenagers and boys and girls, and be occasion for considerable merriment and social interaction.

A number of edible fungi are also harvested and eaten by the Ese Eja. In addition, there are several wild plant foods that are only consumed in the forest. As the Ese Eja become increasingly sedentary, and as the length of trips into the forest are reduced from days to hours, these plant resources gradually lose their importance. During an ethnobotanical inventory in Infierno (Alexiades, 1989), it became apparent that this kind of knowledge is preserved or valued more by the older generations.

Agriculture

Agriculture and Ese Eja society

At the time of the insertion of the Ese Eja into the regional economy, Ese Eja agriculture was largely centered on the cultivation of plantains as a dietary staple.

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The Ese Eja cultivate and distinguish over 10 varieties of plantains and 10 varieties of bananas[4]. Plantains are the only cultigen accorded an important role in creation myths. According to these, the Ese Eja descended to the earth from the sky world upon hearing the cries of plantains,[5] rotting on the earth below[6].

As I discuss in chapters 6 and 7, the ritual importance of plantains is further evidenced by their intimate association to ***eyámikekwa*** shamanism. Two different types of plantain beer, ***epowi sese***, and ***eshasha-powi***, are used as ritual beverages in communal ceremonies aimed at ensuring abundance of game and prevent the onslaught of illnesses. That is, as is often the case in other societies, the nutritional importance of plantains as a staple is paralleled by their ritual importance.

Plantains are ideally suited to the needs of highly mobile hunter-gatherers (cf. Smole, 1976 for the Yanomami). Once planted, swiddens require little attention and are quite productive. According to written reports and oral accounts (e.g. Fawcett, 1911; Nordenskiold, 1906), the Ese Eja would plant plantain swiddens

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4. Though the distinction between plantains and bananas is not botanically justified (Fleuret and Fleuret, 1985), the Ese Eja do distinguish between low sugar varieties, which are eaten cooked, and those high in sugars eaten as fruits. I maintain this distinction throughout my discussion.

5. In a version of the myth reported by Burr (1997), it is the ***edósikiana***, concealed behind a banana, that cries out.

6. The image of the Ese Eja "descending" from the sky to the cries of an introduced plant could perhaps also express a socio-political transition at a certain point in the history of the group, when this cultigen first entered their universe. This is an intriguing possibility, particularly given that, as I have indicated earlier, migration from the uplands to the lower foothills does imply a "descent" of sorts.

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along the rivers, thus ensuring a supply of starch during their extended hunting and fishing trips.

Ese Eja agriculture underwent significant changes during the second part of this century, mainly as a result of migration downriver, greater interaction with market forces, and the incorporation of new agricultural knowledge and crops. Increased contact with the outside, the development of a more sedentary lifestyle, and the growing dependence on the demands and needs of a market economy, have all led to an increased investment in agriculture as a subsistence strategy. That is, culture change among the Ese Eja has altered both the amount of time invested in agriculture and the characteristics of the agricultural activities themselves.

Introduced cultigens include rice, squash, watermelons, several kinds of beans, sugar cane, and tree crops such as citrus fruits. Contact with market agriculture and other human groups has also led to the incorporation of new varieties of manioc and maize and to the simultaneous decline and loss of other local varieties. Most Ese Eja over forty for example, are familiar with ***eji shojo***, a variety of manioc which apparently was eaten raw and which is now apparently lost. Similarly, several varieties of ***jipamo***, from the description probably a Cucurbitaceae, have been lost. ***Jipamo*** was apparently planted at the base of

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the trunk of large trees which had been killed through girdling.[7] The plant grew as a twining liana, covering much of the tree and developing long fruits which eventually fell, to e eaten raw or cooked.

Cultigens such as rice, ideally suited to the current mix of subsistence and market needs, are considerably more labor intensive than plantains. Similarly, increased dependence on centralized services and access to manufactured goods leads to more sedentary, crowded settlements, limiting the viability of local natural resources to support a lifestyle based on hunting and gathering.

Agricultural cycle

As in other parts of the region, the timing of the Ese Eja agricultural cycle is largely determined by the seasonal cycle of rains. Sites for new fields are selected at the end of the rainy season, around March or April. Sites are selected according to several ecological and socio-political criteria. Options include floodplain (***joyawa***) as opposed to upland or terra-firme (***emako***). Floodplain soils are richer and hence more productive, though riskier to farm due to their exposure to floods during the rainy season. Furthermore, informants report that rice grows better in terra-firme, particularly as there are less pest problems there.

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7. Before the advent of steel tools, all large trees were killed by girdling. It is possible then that the incorporation of steel axes and the subsequent changes in how swiddens are prepared, is associated with the gradual disappearance of ***jipamo*** as a plant resource.

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Households may clear up to two new swiddens a year, one in the upland and one in the floodplain. More often however, only one new swidden will be made each year, often alternating between the floodplain and terra-firme. There is also considerable variation between communities. Some, like Portachuelo Bajo, have very little access to terra- firme, while in others floodplain sites are quite limited.

Another decision that needs to be taken into account by the farmer is whether to create the new swidden in primary or secondary growth. Preparing a swidden in primary forest entails felling large canopy trees, and thus demands a substantial labor investment compared to secondary growth, in which large or hard-wooded trees are absent. Rice production in particular however, is usually better in new swiddens due to lower risk of infestation from pests. Again, different communities have different kinds of limitations in the availability of primary and secondary vegetation as potential swidden sites.

Individuals tend to locate their swiddens close to those of kin. Thus, the spatial relationship of fields reflects socio-political relations within the community. Frequently, members of the same extended family will work together, clearing and preparing the land for a new swidden, which is then divided up and cultivated independently. When choosing the site of a new swidden, attention is also paid to avoid areas with excessively large or hard-wooded trees. The extremely hard wood of the emergent tree *Dipteryx* for example, is a good deterrent to a swidden

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farmer relying on an axe. In some communities, sites with productive Brazil nut trees are avoided, since the species is protected by State law and valued as market resource by the community.

New swiddens, rice in particular, are about one hectare, though again there is much variation. Younger households tend to have fewer and smaller fields than the households of the older men. This is because, younger men are generally more committed to a subsistence strategy involving hunting, fishing and gathering of subsistence and commercial forest products, including timber and brazil nuts, while older couples invest more in agricultural production. In this way, different strategies within extended families complement each other.

Once a swidden site is demarcated, men and to a lesser extent women, slash down the lower layers of vegetation with machetes. Once this is done, the men begin to fell the trees, a process that may take one or two months. The use of chainsaws is recent and limited to a handful of households in Infierno and Palma Real with greater contact with external credit agents and sources of income. All other Ese Eja clear swiddens with steel axes. The felled vegetation is left to dry during the entire dry season, and burnt before the new rainy season, usually in September or October.

The timing of the burn is depends on the crops to be planted. Rice requires careful timing: the ground needs to be bare, and thus recently burnt, but planting

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has to be shortly followed by rain, or else the plants will die or grow weak and become vulnerable to pests and diseases. Waiting too long on the other hand, risks having rain wet the cut vegetation, resulting in a bad burn. A badly burnt field is harder to plant, results in a large cumulative area lost to unburned branches and vegetation, and has lower productivity. Plantains on the other hand are quite resistant, and may be planted weeks before the onset of the rains and in terrain littered with debris.

Once burnt, rice swiddens need to be further prepared for planting by cutting up the unburned branches of felled trees, piling them up and burning them again to ensure a planting area free of large debris. Plantains on the other hand, can grow in swiddens which have not been as thoroughly prepared, and which include remnants, or actual standing, vegetation. Plantains thus require smaller labor inputs for swidden preparation and maintenance, and for harvest.

Once burnt, new swiddens are usually planted with rice and/or maize. Frequently, the bulk of the new field will be rice, interspersed with rows or patches of maize. Maize is frequently also planted along the sides of the field. This practice minimizes shading of rice and damage to rice plants during the harvest of maize, which is weeks or even months ahead that of rice. Women, who usually manage seed stock and make most decisions as to which varieties to plant, also do most of the planting of maize and rice. Frequently, the husband

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will walk ahead of his wife, puncturing small holes in the ground with a stake, into which his wife drops some seeds.

Pineapples, sugar cane, root crops, plantains and bananas may also be planted at this time. Bananas and pineapples are usually planted along the perimeters of the field. Sugar cane and manioc are often planted as small patches in a corner of the rice swidden. Up to half of the new swidden may be planted with plantains. In some cases however, plantains, manioc and even maize are not planted until after the rice harvest around February. Planting bananas involves digging deep holes and transporting heavy cuttings. Like most heavy physical labor, it is usually performed by men.

Ultimately, who plants what and where is quite variable, and contingent on a number of factors, including access to seed stock, personal preferences, degree of investment in agriculture, past planting history, and household composition. Because many cultigens are considered polluting and dangerous for pregnant women or young children, younger households will frequently plant a lesser diversity of crops. In Sonene at least, older people have not only larger, but also more diverse fields, as they dedicate greater amounts of time to agriculture and are not bound by the dietary restrictions of younger people. Thus, although there are about 20 varieties of plantains and bananas, most swiddens will only have but a handful of these. Plantain swiddens are generally dominated by only two

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varieties: ***ejawi nei***, and ***topa ai***, both considered safe to eat at all stages of child development.

Rice fields are usually only weeded once, though an additional weeding may be necessary if rice was planted in fallows, or if the swidden did not burn well. Harvesting is extremely time-consuming, and families seek the help of children and kin. Indeed, the demand for labor at this time is so intense that some individuals do not plant rice, but rather rely on their help being requested during harvest, in exchange for a considerable portion of the harvest. At times, when labor is insufficient, some of crop is left to rot on the stalks.

Following the harvest of rice and maize, the number of options and agricultural permutations increase. As much as half of the original rice swidden may be left fallow for the next year or two. The remaining area is usually planted with a range of crops, including plantains, manioc, maize and sugar cane, though again there are a wide range of options that are utilized according to circumstances and to individual strategies.

Over the next few years, a number of perennial crops, including ***woi***, *Dioscorea trifida* L.f, and fruit trees such as *Anacardium occidentale* L., *Mangifera indica* L., *Inga edulis* Mart., *I. macrophylla* Humb. & Bonpl. ex Willd., *Theobroma cacao* L., *Pouteria spp.*, and *Rollinia mucosa* (Jacq.) Baill., are planted. Seedlings of wild

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fruit species such as *Garcinia madruno* (Kunth) Hammel or *Perebea xanthochyma* Karst. may also be planted in these fields.

After two years, productivity of plantain trees, especially in upland swiddens, begins to decline. Fields are progressively weeded less often, though crops such as papaya and root crops such as yams and, to a lesser extent manioc, are still harvested years later.

At any given time therefore, most Ese Eja will have two or three fields, each in different stages of agricultural succession and/or in ecological zones (i.e. floodplain versus upland). Agricultural successional stages can be broadly classified as:

1. Young swiddens, dominated by grains: rice or maize
2. Middle-aged swiddens, consisting mostly of plantains, manioc and other root crops and papayas.
3. Old swiddens, in which plantains are in the process of being abandoned, and swidden productivity is replaced by perennial crops, including fruit trees.

Usually, the intermediate fields are the most diverse, though it is the early successional fields which require most labor. Floodplain swiddens tend to be more diverse than upland swiddens, perhaps because the soils are richer. Certain crops, notably plantains, sweet potatoes, manioc and watermelons, are more suited to the sandy silt-laden soils of the floodplain.

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Maize, watermelons and such minor and recently introduced crops as tomatoes for example, are frequently planted in fallows or one-year old swiddens at the onset of the dry season, between May to July. Plantains are planted throughout the seasons, though less frequently at the height of the dry season. Unlike manioc tubers, which can be left underground until needed, and unlike rice, which can be stored, plantains have to be harvested once they ripen on the tree. Sequential planting of plantain trees ensures that there are always some individuals ready for harvest, ensuring a steady supply and minimizing waste.

Home gardens

In addition to their swiddens, most Ese Eja- notably women- will plant a range of food, ornamental and medicinal plants around their homes, usually in the back. These areas have quite a high diversity of cultivated plants, and unlike swiddens are not dominated by any one particular species. Typical fruit trees, aside from those commonly planted in swiddens and listed above, include citrus fruits, *Bactris spp.*, *Psidium guajava* L., *Persea americana* Miller, and *Artocarpus spp.* Other food species include *Capsicum spp.*, *Ananas comosus* (L.) Merr., *Passiflora spp*, and many of the cultigens found on swiddens, including *Ipomoea* and *Manihot*. In addition a wide range of ornamental, medicinal and industrial plants are grown, including *Momordica charantia* L. and *Crescentia cujete* L.

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for vessels, and a cultivated variety of *Gynerium sagittatum* whose inflorescence stalks are used as arrow shafts.

Homegardens are important sites for experimenting with the cultivation of wild and introduced crops. Fruit trees found only upriver, such as *Calatola* sp., are transplanted onto homegardens. Likewise, many of the introduced medicinals and ornamentals discussed in chapters 8 and 9, are first grown in these home gardens, becoming subsequently dispersed, either intentionally and/or spontaneously.

Domestic animals

The Ese Eja only started to raise domestic animals in the last decades, and even today, chickens, ducks and pigs are only consumed occasionally, usually during birthday parties or other celebrations. More often, domestic animals are kept as a form of capital, and exchanged or sold to river merchants in time of need. Indeed, the Ese Eja do not particularly like to eat these animals, as "they eat feces".

Earliest contact with domestic animals took place in Dominican missions and "barracas", where such animals were customarily raised by priests and "patrones" respectively. Arana (1939:221) notes the fear and aversion of the Ese

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Eja towards mission cows, a sentiment that continues to be quite common among the Ese Eja today. Starting in the 70's, evangelical missionaries in Bolivia and government development agencies in Peru initiated a number of, usually failed, programs to encourage cattle raising. Even so, some families still have a few heads of cattle in Portachuelo Alto and in Infierno, though again these are used as capital and sold in times of need. A number of church and government development programs have attempted to promote raising of domestic animals. The last such attempt was an Italian development agency that distributed guinea pigs among Peruvian Ese Eja, hoping that these would be successfully raised and provide an alternative source of protein. While some have had more success than others, these programs have frequently fueled environmental problems and social tensions.

Pigs are notorious for uprooting and destroying crops in fields, creating considerable conflicts between pig owners and those of damaged crops. Attempts to enclose the animals have been largely unsuccessful, probably because of the substantial increase in time and energy that enclosing animals entails. Aside from having to build and maintain enclosures, owners also need to feed the enclosed animals with agricultural produce. Free-ranging pigs on the other hand, require little attention, as they opportunistically forage throughout the village and surrounding areas. The increase in domestic animals has certainly contributed to some health problems, the repercussions of which are discussed in chapter 11.

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Dogs are probably the most ubiquitous of Ese Eja domestic animals. While some are kept as hunting dogs (***iñawewa niñeji***) others are kept purely for protection against chicken thieves and certain evil spirits, namely the ***ekwikia***.

The Ese Eja, as many other Amazonian groups, love to keep wild animals as pets, investing considerable amounts of time and effort to capture and raise young wild vertebrates. Though favorites are monkeys, macaws and parrots, I have seen sloths, porcupines (gently hitting it with a stick causes the animal to release its spines), peccaries, deer, tapir, capybara, turtles, guans, toucans, vultures, a broad range of smaller birds, and even a caiman as pets. The only animals never raised are snakes and wild cats. Most pets are not able to survive the curiosity of children or the rivalry of dogs and pigs for more than a few weeks or months.

Pets are usually captured at an early age, and the language that is used to describe the process of raising these young animals is the same as that used to describe the adoptive process that so characterizes the Ese Eja. Women commonly suckle young dogs, peccaries or monkeys, and owners sometimes express feelings of sadness when a pet dies, particularly when they survived for a number of years. Likewise, pets are only rarely consumed (cf. Erikson, 1997), and then usually by "meat hungry" old people who, in general, do not benefit from the reciprocal system of exchange of game as much as the younger, more

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economically active members of the community. The raising or "domestication" of pets is frequently equated to the process of civilizing savages. As an Ese Eja friend once remarked to me, spider monkeys are "amansados", ***ewonei*** ("tamed") just like "our ancestors were tamed ("amansados") by ***deja***". The process of taming is thus essentially a process of socialization, of integration into the social body of the Ese Eja as opposed to the social body of nature. There are a number of plants used to facilitate the taming of wild pets.

In sum, the typical Ese Eja village will typically include a diverse number of marauding animals, including pigs, ducks, chickens, dogs, domestic cats and miscellaneous pets. These are all inevitably hungry, annoyingly curious and quite ingenious at eking out a living from their human hosts as they wander about from household to household.

Commercial resource extraction

Historically, animal skins were an important item of trade with market agents. Commercial hunting continued to be an important activity until legislative changes beginning in the late 1940's, which it illegal. Targeted species included wild cats, white-lipped and collared peccaries, giant river otter and black cayman. Today the demand for wild skins is practically non-existent. Selling meat and fish does provide small but significant monetary returns to some Ese Eja, particularly young men, who enjoy hunting and the immediate returns it provides. Likewise,

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fishing can provide important additional revenues to individuals, particularly those that have acquired the necessary equipment, such as motorized canoes and large nets. In the case of Palma Real for example, two individuals control much of the commercial fishing in the community, utilizing other Ese Eja as laborers and replicating the structures of economic exchange that characterize debt-peonage.

The principal commercial activity for most Ese Eja is Brazil nut and leaf thatch, *Geonoma deversa* (Poit.) Kunth. An exception is Portachuelo, which has no access to populations of either species. Again, not all families or individuals are equally vested in Brazil nut and leaf-thatch collecting strategies, but overall these are the most important, albeit seasonally restricted, sources of cash for many Ese Eja. Recently, a number of development projects and incentives have sought to increase the financial returns from Brazil nut collecting by encouraging families to dry and de-husk nuts, selling them at a higher price. Collection and weaving of *Geonoma* thatch in the dry months is an ideal complement to Brazil nut harvesting, which takes place in the rainy season.

Commercial logging is not very important for the Ese Eja, mainly due to limited access to the necessary equipment, and to their reluctance or inability to enter into stable economic agreements with "habilitadores".[8] Nevertheless, most Ese Eja men, particularly the younger generation, do occasionally work as laborers or

8. "Habilitadores" are middle men who provide the necessary equipment and a cash advance to buy supplies, in exchange for a significant cut.

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enter some kind of agreement whereby they are able to sell some timber. In the case of Portachuelo however, the nearby stocks of commercially viable species have long been depleted, and the Ese Eja do not have the means to travel the required long distances to reach remote stands. In Peru, access to commercial timber is now severely restricted by the fact that the entire area surrounding Ese Eja communities is under some form of protection that explicitly bans commercial logging.

The importance of agricultural produce as a market resource varies between communities and households. Access to rich varzea soils, adequate means of transportation and a local demand for plantains, all contribute to making this produce the principal trade and cash item in Portachuelo. Sonene on the other hand, does not have the soil resources to permit such large-scale plantain production. Moreover, the market in Madre de Dios is shaped by the tastes of Andean immigrants, which do not include plantains. A State credit system, now defunct, encouraged wide conversion to rice farming and cattle ranching in the 1980's in some of the more market-oriented communities in Madre de Dios, helping to establish rice agriculture in Infierno.

Infierno Ese Eja also work as day laborers for wealthier Ribereños in the community. Ese Eja in Palma Real, and a lesser extent Portachuelo, occasionally work as laborers for wealthier Ese Eja in the community. Increasingly, as communications improve and the relationships with the town of

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Puerto Maldonado intensify, younger people begin to move back and forth between periods of subsistence-based agriculture in Infierno and wage-labor in Puerto Maldonado. Dependence on wage-earning activities is thus most marked in Infierno, which is gradually becoming an economic satellite of Puerto Maldonado.

In Sonene the situation is different from both Portachuelo and Infierno. The community is furthest from any market and has still serious logistical and financial limitations for the transport of any kind of produce. While meat can always be salted and sold locally to Bolivian loggers, agricultural produce is more perishable and has a lower return for bulk, and so is not an important source of revenue. Even then, stored rice is sold if the need and opportunity arises. The dual role of rice as a subsistence and market crop, and the fact that it can be stored for 'ong periods of time, are well suited to the needs of the Sonene Ese Eja, who maintain intermittent but critical links with the market economy.

Material culture

Ese Eja material culture is not as extensive as that of other Amazonian groups. The Ese Eja have no ceramic tradition, and have little ritual or artistic paraphernalia. Until the advent of metal pots, all food was either roasted in open fires or cooked in leaves or bamboo stalks (***dewe***)[9]. Instead of reviewing Ese

9. Ese Eja reports all confirmed Zeleny (1976:110) in his assertion to this effect. However, Metraux (1948) notes that the Ese Eja did make pottery.

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Eja material culture[10], I will illustrate some of the major aspects and plant resources involved, signaling in particular recent changes that have occurred, and the different criteria that are employed in the selection of different alternatives.

House construction

Transition towards a sedentary lifestyle involves greater allocation of resources in the construction of shelters. In the past, foraging bands of Ese Eja would frequently set up makeshift shelters on river sand banks, built with the branches of riparian species, such as *Gynerium sagittatum*, *Salix humboldtiana* Willd., and *Vernonia patens* H.B.K. These camps are still built when the Ese Eja abandon their villages to gather turtle eggs and fish during the dry season.

During the rainy season, the Ese Eja would build more permanent shelters, but even then these were typically abandoned after a few years. Leaf thatch, such as *Attalea maripa* (Aubl.) Mart. is perfectly adequate for this kind of construction, particularly as the leaves are easily harvested and a roof is thatched fairly quickly. In contrast, the typical Ese Eja of today is expected to last from 5 to 10 or more years. Consequently, whenever available, *Geonoma* is preferred as a

10. Hissink and Kahn (1988) and Zeleny, (1976) review different aspects of Ese Eja material culture, including bark and cotton clothing, weaving of mats, and tool construction.

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thatching material. Although weaving *Geonoma* thatch is labor intensive, the thatch is longer lasting than *Attalea*[11].

Greater attention too is paid to the species used as posts in contemporary Ese Eja houses. While the trunks of several palms, notably *Astrocaryum* (***jaja-sie***) and *Oenocarpus* (***bajowi***) were most commonly used "by the ancestors" for posts, prized species today include *Minquartia guianensis* Aubl., (***wimiji***), *Tabebuia spp.*, (***akwi-dojo-tewe***), and *Myroxylon balsamum* (L.) Harms (***yohimoshikwiji***). These hard, dense woods were clearly inaccessible to the Ese Eja at a time when steel tools were not easily available.

Today, Ese Eja houses resemble those of other Amazonians, and consist of four, occasionally six, corner posts, with the thatch ending two to three meters off the ground. Some houses have a raised platform made with the sliced or beaten trunk of *Iriartea deltoidea* or *Socratea exorrhiza*. Walls, partially or totally enclosing the house are also made from the slats of these palms, or *Euterpe precatoria*. In contrast, "traditional" Ese Eja shelters had no walls, as the leaf thatch reached the ground. When present, walls were made with *Gynerium sagittatum* stems. Moreover, these shelters had no elevated floors.

11. *Geonoma* thatch is labor intensive because the leaves are small, and need to be individually woven around thin slats of *Gynerium* stems. *Attalea* leaves in contrast, are very large, and thatch is made by simply folding leaflets over the thick, woody midrib.

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Basketry and weaving

Women, and in some cases men, weave floor mats, fans and baskets from several plant species, mostly palms. The leaflets of *Orbygnia*, *Euterpe*, and *Astrocaryum* are used to weave floor mats and fans, using a number of different weave types. Longitudinal strips from the mature stems of *Gynerium sagittatum* are also cut and used to weave sturdy, durable floor mats. Baskets, and more recently brooms and hats, are woven using the stems of several vines, including ***picheme*** (*Heteropsis oblongifolia* Kunth), and ***ño kwi'***, *Thoracocarpus bissectus* (Vell.) Harling.

Fabrics

Before depending on manufactured clothes, Ese Eja wore long vests made with cotton or bark cloth, ***daki nei***. Bark cloth was obtained mainly from ***maja nei***, *Poulsenia armata* (Miq.) Standl., and ***pie***, *Ficus* maxima P. Miller. Cotton,[12] ***wapehe*** (*Gossypium barbadense* L.) was also weaved, and dyed with ***apo'e*** (*Bixa orellana* L.), ***ma'i pojo*** (*Picramnia sellowii* Planchon), and ***sheshena'*** (indet.). The art of weaving cotton has almost been lost. Today, there are but a few women in Sonene who claim to know how to spin and weave cotton, and then only rarely do so.

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12. According to Chavarría and Sánchez (1991), cotton was obtained through contact with Panoans.

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Canoe-making

Though most Ese Eja agree that canoe-making was learnt through contact with "outsiders", this event seems to have taken place at different times for different groups over the last century or more. Generally, the use of canoes marks the stage at which Ese Eja developed regular contact not just with external agents, but more generally with the lower, navigable reaches of rivers.

Rivers in the mid and upper sections of Ese Eja territory are fast flowing, making human-powered navigation against the current almost impossible. Downriver travel was performed in rapidly assembled balsa (*Ochroma lagopus* Sw.) rafts, and upriver trips were made by foot. While canoes were being used by some of the Bawaja groups living on the lower Madre de Dios before the turn of the century, for others, the incorporation of canoes has taken place within living memory. It is also possible that canoe-making technology was incorporated and abandoned more than once, according to the use of different parts of the river at different times in history.

Canoes are made from several species. While the most valued species is ***jo'ano*** (*Cedrela odorata* L.), other options include ***meisóe*** (*Aspidosperma marcgravianum* Woodson), ***shi'be*** (*Hura crepitans* L.), and ***kajo-shasha*** (*Apeiba aspera* Aubl.).

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Seasonality of subsistence activities

The above sections have provided numerous examples of how the cycle of subsistence activities, including hunting, gathering and agriculture, are largely determined by the distribution of the rainy and dry seasons. Timing of most subsistence activities is also influenced by the phase of the moon. Herbivores are more active on the darker, moonless nights, and it is at this time that the Ese Eja go night hunting. The new moon is reportedly also associated with the arrival of large herds of white-lipped peccaries.

Storms, particularly in the rainy season, roughly coincide with the change in the lunar phase and so the upriver migration of catfish follows changes in the moon. Honey production is believed to be at it's lowest at this time however, and hence usually gathered in full moon. Finally, construction and thatching materials are never collected in the new moon, as they are thought to rot much faster. Most agricultural activities, from felling trees during swidden preparation, planting and harvesting are not performed at the outset of the lunar phase. Consequently, the Ese Eja invest more time in fishing, hunting or weeding their swiddens at this time.

The moon has important symbolic connotations. The night, and dark evenings in particular, are associated with ***eshawa***. Just as the Ese Eja hunt in moonless nights, do the ***edósikiana*** "hunt" Ese Eja. Noting the relation between

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edósikiana and the moon, Burr (1997: 309) notes that the in the new moon, the ***edósikiana*** "comes down and stalks around looking for somebody to kill and eat". The ***eshasha-poi*** and other shamanistic rituals are meant to offset the "dryness and scarcity in the natural world during the new moon" (ibid.).

Gender and subsistence

Most subsistence activities are underscored by gender differences. While gender divisions are sometimes absolute, as in the exclusion of women from using firearms or bow and arrow, most differences reflect only tendencies. Thus, while women rarely carry out heavy work associated with tree felling or transporting and planting heavy plantain cuttings, there are instances where certain women have done these. Likewise, there have been some past cases of women becoming ***eyámikekwa*** shamans.

While there are some subsistence activities and social roles from which women are excluded, the inverse is not true, at least to my knowledge. That is, while cooking, raising children and washing clothes are female roles, men may take on these responsibilities at certain times. As Balée notes for the Ka'apor, gender differences in subsistence and social roles tend to reflect differences in allocation of time rather than clear-cut differences in roles (ibid. 1994:50). Thus while women tend to be responsible for the management and planting of seed stock,

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as well as harvesting, there are frequent exceptions compounded by the fact that men usually participate in these tasks, but to a lesser extent.

Knowledge on particular semantic domains is also frequently unevenly distributed between genders. Prance (1984) for example, notes that among the Yanomami, women have the greatest amount of mycological knowledge. In chapter 10, I further explore gender differences in terms of the knowledge and use of medicinal resources.

Ese Eja subsistence and culture change

Throughout the above discussions, I have highlighted the ways in which Ese Eja subsistence practices have changed in recent history. These changes are due to a number of interrelated processes, including access to new technology, knowledge and crops, changes in settlement patterns, and the demands and needs of local markets. At a time when the Ese Eja had limited direct contact with ***deja***, subsistence was characterized by high mobility, and a dependence on wild protein and plantain-based swidden agriculture. Gradual integration in the nation state has implied a shift away from these practices, with a concomitant growth in the importance of agriculture and market-driven resource extraction activities. Plants seem to occupy a more important role today than they did in the past, as both agriculture and forest extractivism are largely based on the

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interaction with plants. In chapters 8, 9 and 11 I suggest that plants have also become more important in Ese Eja medicine.

These changes are also reflected in the symbolic roles of plants and animals in Ese Eja mythology, shamanism and medicine (see chapters 6 and 7). The traditional dependence and cultural importance of animals as opposed to plants is reflected in Ese Eja myths. While animals play a central role in most narratives, plants are conspicuously absent. Unlike most animals, which "were once Ese Eja", few plants are believed to have metamorphosed from their original state as Ese Eja. Animals and Ese Eja share a common mythic origin, something that in general does not apply to plants. With the exception of the mythical tree ***batsaikwi***, most references to plants in myths are superficial, and usually connected to an event in which an animal plays a major role. Some examples include:

- The treelet ***shawi*** (*Calliandra angustifolia* Spruce ex Benth., Mimosaceae), used by a cultural hero to make a bow to kill an aquatic monster, ***kobaki***, that devoured the ancestors
- The seeds of ***shakaka*** (*Socratea exorrhiza*) tossed into the water by the deer ***dokwey***, and transformed into the snail ***sijaja***.

The few times that plants play an important role, it is in connection with their importance to animals. The flowers of ***kwaso*** (*Erythrina* spp., Fabaceae) for example, transformed into other trees "so that birds could rest".

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The minor role of plants in Ese Eja mythology contrasts with that of other Amazonian horticultural societies, where horticulture, cultivated plants and plants in general are endowed with greater mythological salience (e.g. Bidou, 1996; Chaumeil and Chaumeil, 1977). To my knowledge, and in contrast with other groups, there is no Ese Eja mythic account for the origin of agriculture or cultivated plants[13].

Finally, the Ese Eja classification of animals, particularly vertebrates and economically important invertebrates, is quite elaborate and subject to a much higher degree of consensus than that of wild plants.[14] By the age of nine, most Ese Eja boys, and to lesser extent girls, will know a vast number of fish names and will be quite capable of identifying these, either live or in pictures. Although extensive taxonomic knowledge of animals only develops later, it is also widespread. In contrast, ethnobotanical knowledge appears to not be as widely distributed among adults, and is subject to greater degrees of intra-cultural variation (see chapter 10). While some of these differences may be due to the fact that migration downriver has implied greater changes in the botanical than zoological environment, there is little question that as a whole, Ese Eja culture is, or has been, largely fauna-centered. A similar appreciation has been noted by Gray (1997), who notes that the Arakmbut, like the Ese Eja have a "cosmological emphasis on the animal world" (ibid. 261).

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13. Alvarez (1950) reports a mythic tree, *ishimata*, as a precursor of all fruits. I have not been able to validate this observation.

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The changing importance of plants in Ese Eja affairs is, I suggest, also reflected in the use of plants as symbolic artifacts. This is most evident in the context of ayahuasca, a hallucinogen incorporated into Ese Eja ethnomedicine in recent history. In chapter 7, I explore the notion that ayahuasca and ***eyámikekwa*** shamanism, with their rich use of complex plant and animal imagery, reflect ongoing changes in how the Ese Eja are structuring social and environmental relations.

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14. Lizot (1980: 15) notes that the Yanomami, whose subsistence strategy shares important elements with the Ese Eja, "do not have a systematic taxonomy for wild and cultivated plants."

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PART III. PLANTS AND SYMBOLS.

ESE EJA ETHNOMEDICINE, SHAMANISM AND COSMOLOGY

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Chapter 6.

Ese Eja Cosmology and Ethnomedicine

Introduction

In the previous section I described the basic characteristics of the Ese Eja natural and social environment, as well as some of the ways in which natural resources are utilized. In this chapter, I turn my attention to the interpretative framework and logic used by the Ese Eja to make sense of their surrounding world, including such incidents as illness. In order to do this, I introduce some basic concepts pertaining to the body, conception, life and death, and to such vital processes as food procurement, eating and sexual relations.

I hope to show that the concept of ***eshawa***, whose translation would approximate that of "spirit" and "soul", is the central means through which the Ese Eja draw causal links between observable and unobservable phenomena relating to the body, death, illness and healing.[1] Through their interconnection with the primordial time and space of an undifferentiated, mythical world, ***eshawa*** provide a link between the Ese Eja and the various levels of reality

1 Burr (1997: 1) describes eshawa as "..a unitary spiritual property..." suggesting that "diverse things/entities...vision, voice, thought, shadow, reflection [..are all manifestations of eshawa..].

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which the Ese Eja construe as the universe. I will endeavor to show how this view of a multi-partite universe consisting of distinct yet at times permeable "worlds" or "societies", is central to Ese Eja notions of "nature" and of "natural" events.

Another important element in Ese Eja worldview is that of ***deja***[2], or the representatives of what constitute "the national society" for the Ese Eja. In effect, I suggest that contemporary Ese Eja social identity is constructed with reference to three cosmological actors: ***eshawa***, ***edósikiana*** and ***deja***. Of these, the latter two represent opposite poles of alterity (cf. Gow, 1993). I suggest that for the Ese Eja, illness is seen as the unfortunate consequence of necessary but potentially dangerous interactions between the Ese Eja and their natural and social universe, characterized by ***eshawa*** and ***deja*** respectively.

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2. The category of ***deja*** needs elaboration. Above all, the term ***deja*** or ***deja nei*** is used by the Ese Eja to describe all non-Ese Eja; that is, as a marker of a particular form of social alterity. As such, it is an important frame of reference for Ese Eja identity. Other indigenous groups are not considered ***deja*** however, unless they have incorporated the ways of ***deja***, such as the manner of speech, consumption habits and values. Assertiveness, individualism, familiarity with urban tastes, material wealth and good public oratory are some of the attributes ascribed to ***deja***. Clearly, the category is not rigid, and the Ese Eja themselves ponder on occasion on how to apply the category to certain groups. For example, indigenous peoples who are indigenous according to self-representations but ***deja*** according to the Ese Eja have a particularly problematic and shifting status. Generally, however, acculturated groups, including the Tacana of Bolivia or Peru, are considered to be ***deja*** by the Ese Eja. Ese Eja who aspire to ***deja*** values are referred to as ***deja nisho*** "fake ***deja***". Thus, there is a continuum that ranges from ***deja nisho*** to ***deja nei***. In this way, the Ese Eja implicitly recognize that identity is socially and individually constructed and to an extent negotiable. In effect, other more acculturated indigenous groups, "Ribereños", migrants from the Andes, the coastal region, and other Latin American countries are all ***deja***. Incidentally, other indigenous groups who speak a native language and who have the same or less dependence and access to manufactured goods are referred to as Ese Eja, though only the Ese Eja are Ese Eja ***nei***, "truly Ese Eja". The status of Euro-Americans is distinct from that of ***deja***; though again distinctions are relative and fluid. Whites are referred to as ***ninko*** (derived from the Spanish "gringo"), ***deja oshe***, or ***ichahi oshe*** (white capuchin monkey).

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Cosmology

Like many other indigenous groups (e.g. Chagnon, 1968, for the Yanomamo; Reichel-Dolmatoff, 1971, for the Tukano; Weiss, 1974 for the Ashaninka), the Ese Eja have a multi-layered view of the cosmos. The sky (***eya***), ground (***meshi***) and underground (***meshi' dojo'***)[3] layers is in turn subdivided in different ways: thus the sky layer, has two distinct layers. All layers of the cosmos are internally organized in fundamentally the same way: they have rivers, plants and animals, and are populated by anthropomorphic beings. The visible and/or invisible, human and/or extra-human beings populating all layers of the cosmos, also share a common existence, subsisting by hunting, fishing and practicing agriculture. Beings of the sky, earth and water are referred to as ***eyákwiñaji***, ***meshíkwiñaji***, and ***enákwiñaji*** respectively (Chavarría, 1996).

In addition, there is ***kweyhana***, 'the world of the dead', inhabited by the souls of all deceased, the ***emanokwana***. ***Kweyhana*** exists in a "dimension of spatio-

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3. Chavarría (1996:53) records this as ***meshi nobi***. Burr (1997: 184) points out that the 'sky world' is located 'up above' and 'down below' simultaneously, and that during ***eshasha-poi***, the ***eyámikekwa*** travels to the latter by descending to the former. As referents to a primordial time characterized by an undifferentiated state of being, the sky and ground are thus simultaneously considered a single and different spaces.

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temporal alterity...where sky and earth are re-joined and where unity with the other is the destiny of Ese Eja becoming' (Burr, 1997: 185).

In addition to the vertical differentiation, some layers, such as the earth layer, are horizontally differentiated as well. The headwaters (***eyobiho***) are distinct from the lowlands. Whereas the headwaters are associated with the past, abundant game and with the ***eshawa***, the lower margins of the rivers are associated with modernity, manufactured goods and ***deja*** (cf. Reichel-Dolmatoff, 1981). Likewise, the world of water, ***ena***, is interspersed amidst that of the earth, ***meshi***. (Chavarría, 1996)

All forest creatures are under the control of the ***edósikiana***, as all aquatic ones are under that of the ***ena' edósikiana*** (e.g. Verna, 1985-1986). The ***edósikiana*** and the ***ena' edósikiana*** are but two of the many invisible, extra-human beings which populate the Ese Eja cosmos.

In addition to these invisible beings there are visible ones[4]; animals, plants and humans, the latter including ***Ese Eja nei*** "true Ese Eja" and ***deja*** or "outsiders". Each of these beings inhabits distinct spaces and is associated with distinct

4. The distinction between visible and visible beings is mine, and probably not shared by the Ese Eja, at least at the same level. That is, while the Ese Eja recognize that some beings are not ordinarily visible, these beings are still considered to be visible under certain some circumstances or to some people. Likewise, visible beings are manifestations of powerful, and in effect just as, if not more, real than visible beings. For this reason, from now on I will refer to "invisible beings" as extra-human.

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resources. Ese Eja cosmology belies a profoundly socio-ecological view of the world, in which the interdependence and interaction between different beings and "social spaces" within the cosmos is seen as the simultaneous source of sustenance and life, and of predation and death.

Body and Soul

Emic[5] representations of the body and self are difficult to articulate since the repertoire of terms available to describe these are inevitably restricted by our own conceptions, including such dichotomies as body-soul, mind-matter, visible-invisible, real-unreal.

The term ***eyami*** loosely corresponds to that of "body[6]", in that it refers to the ordinarily and immediately visible, physically tangible, and impermanent part of a person or animal. The term ***eyami*** is rarely used to describe the living body, though strictly speaking it can be used for that too. Moreover, in mythical accounts, ***eyami*** is frequently likened to "clothing". In chapter 5, I described how, for the Ese Eja, white-lipped peccaries, ***ño'*** (*Tayassu pecari*), are the

5. An emic model is one which explains the ideology or behavior of members of a culture according to indigenous definitions. In contrast, an etic model is one which is based on criteria from outside a particuarl culture. Etic models are held to be universal; emic models are culture-specific (Barnard and Spencer, 1996).

6. The diverse meanings of the body as a locus of social, symbolic and ethnomedical meanings have recently been explored by several Amazonianists. For a recent review and presentation of several perspectives, see discussions by Pollock (1996), McCallum (1996) and Conklin (1996).

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physical means through which the souls of dead ancestors, the ***emanokwana***, return to "this", everyday, world. In this case, the ***eyami*** of the peccaries, consumed as meat by the Ese Eja, are in a sense the "clothes" or visible envelopes donned by the ***emanokwana*** to travel to this world.

The process of transformation and donning of the ***eshawa*** with ***eyami*** is an important theme in Ese Eja creation myths. According to these, most living beings were once Ese Eja, and thus human. More accurately, humans and extra-humans share a common origin. The primordial condition of existence was clearly undifferentiated: what are now distinct layers of the cosmos were then collapsed, and what are now distinct beings, human versus extra-human, animals versus humans, were also one.

Ese Eja cosmogenesis entails a process of structural and functional differentiation of the universe and its inhabitants. The layers of the world and its different inhabitants emerged from a primordial, shared, condition through a series of events, usually involving a form of conflict or transgression. Incest, cannibalism, greed, laziness and adultery are some of the asocial, transgressive themes underlying the gradual formation of the cosmos, animals and some plants. (e.g. Chavarría, 1984). Burr notes that most mammals were transformed from humans following ancestral female/male interactions, namely through unsuccessful sexual encounters (ibid: 299).

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The deer, ***dokwey***, for example, was once an Ese Eja married to the daughters of the vultures ***babosewawa*** and ***kakwasho***. He was transformed into his current animal form when, under the guise of relieving himself in the forest, he fell asleep alone by the side of the river. Later, as the two sisters continue to seek a husband, additional transformations are effected, leading to the transformation of several Ese Eja into the armadillos ***tewi*** and ***mawiquijani*** (Dasypodidae), the coati ***wisoso*** (*Nasua nasua*, Procyonidae), and the dung beetle ***emojeji***. Likewise, all venomous creatures were generated from the blood of the fer-de-lance viper ***majasha***, who was cut to pieces by ***so'ipa***, another armadillo (Burr, 1997).

In a sense, mythic transformation from ancestral Ese Eja to animals took place at the level of the ***eyami***. Unlike the ***eyami***, which is ultimately the product of mythical differentiation, ***eshawa*** embodies the "true", essential, primordial, and unchanging element of all beings. As Burr (1997) notes "...the interpenetrating of ***eshawa*** is the primordial matrix that makes up the whole cosmos in its totality" (ibid: 203).

The oft heard statement that "all the animals are Ese Eja[7]", not only refers to the notion that humans and animals have a common origin. It also implies that all

7. "Todos los animales son Ese Eja". This generalization is punctuated by some exceptions. The fish ***na'a-wewi*** (Erynthrinidae) for example, was not Ese Eja, but was created as the manioc of the ***edósikiana***. Likewise, fireflies, ***sokwai***, are created by ***ekwikia***. Unlike animals however, many plants- especially tress- are not considered Ese Eja.

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animals have ***eshawa***, or rather, are physical, tangible manifestations of anthropomorphic ***eshawa***, and hence share an essential aspect of being with humans. Indeed, the radical [***-eja***], as in "Ese Eja", literally means 'person' or spirit (Chavarría, 1996:190), and it can be used almost synonymously with ***eshawa***. Hence, ***hai eja***, the spirit of the catfish ***hai***, is in effect the same thing as the ***eshawa*** of ***hai***. A very similar perception is commonly found among other Amazonians, who view plants and animals as "...embodied spirits, spirits which play invisible but very powerful roles in the dynamics of health and illness" (Kamppinen, 1998). Like most Amazonians (e.g. Brown, 1984; Harner, 1972), the Ese Eja consider the ordinarily visible, what most Euro-Americans consider "reality", to be the reflection of deeper, powerful, ordinarily invisible intelligent forces. ***Eshawa*** animate and determine the form of events in the world of tangible experience.

All plants and animals have ***eshawa***, or rather, are manifestations of ***eshawa***. Remains of living organisms, such as animal skulls, meat, and plant products are all, by extension, manifestations of ***eshawa***, and hence in a sense are "alive", or at least capable of dynamically, if not always productively, engaging with humans. Similarly, body fluids, including semen, vomit, urine and feces have ***eshawa***. Other, to us, non-living, entities may have ***eshawa*** too. Thus, a number of people have explained how projected images, including slides and videos, have ***eshawa***: all of these are projections of beings and hence embody

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eshawa. Voices, shadows, sight and breath are likewise "eshawa emanating from the body" (Burr, 19997: 201).

Conception, birth and growth

For the Ese Eja, conception and formation of the embryo is achieved through the accumulation of sperm in the uterus following repeated intercourse (cf. Burr, 1997: 179). An embryo is thus regarded as the product of the accumulation of sperm, ***ema'i***, within the receptacle of the woman's womb, ***eyone,*** through successive copulation.[8]

The Ese Eja theory of conception embraces a broader social theory, whereby patrilinearity is complemented by uxorilocality. That is, while descent is considered to take place along the father's line (who forms the embryo with his sperm), males move to their wife's parents home upon marrying, at least for a number of years. Like embryos, who are made through the accumulation of the

8. The prevalence or, in any event accusations, of extra-marital affairs implies that from an emic perspective, most Ese Eja have a number of biological fathers. Some of these will have contributed more of their sperm and hence of their paternity than others. The term partible paternity has been coined by Beckerman et al. (1998) to describe this commonly held view among Amazonians. As a result, biological paternity is a lot more ambiguous than biological maternity. While maternity is always clearly and unambiguously associated with gestation and birth, paternity is associated with marital and extra-marital sex. At the same time however, a person traces his or her lineage through the father, even though the institution of paternity is more ambivalent and complex (Peluso, in preparation). This clearly resonates with the uxorilocal residence patterns and patrilineal descent system that prevails among the Sonene Ese Eja, the social and political implications of which have been examined by Peluso (1996) and by Peluso and Boster (1997).

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father's sperm in the mother's womb, the Ese Eja acquire their identity from men but develop socially in the space of the woman's household.[9]

Because sperm has ***eshawa***, the accumulation of sperm and the gradual formation of the embryo is also associated with the accumulation and formation of the child's ***eshawa*** (cf. Kimura, 1985:493). During pregnancy, the developing ***eshawa*** and child are highly vulnerable to attacks and contamination by other ***eshawa***, including those of animals and plants with which the parents interact, either through physical proximity or, more importantly, through ingestion. Pregnancy and lactation mark periods of great vulnerability, where a broad range of dietary and behavioral restrictions serve to protect the vulnerable ***eshawa*** of the developing fetus and child.

At birth, the child's eshawa is considered so vulnerable that simply looking at a newborn for too long can kill him or her. Here, the ***eshawa*** of the adult, projected through the gaze[10], is too "strong" for the child's ***eshawa***, and can inadvertently harm him or her. For this reason, mothers and newborns are expected to go into seclusion, attended only by close kin. Following birth, the child's ***eshawa*** continues to develop with the mother's milk, which also has

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9. I am very grateful to Daniela Peluso, for making this connection.

10. As is the case with images, the gaze is considered a projection of the ***eshawa***. That is, "looking" is not perceived as a passive reaction, in the sense of a response to a particular stimuli, but rather as an action through which the subject projects his or her ***eshawa*** onto the object. The action and intent embodied in vision has important implications with regard to the power of vision and shamanic knowledge, as discussed in chapter 7.

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eshawa. The dependence of the child on its immediate family also signifies an attachment and interdependence at the level of their ***eshawa***. What parents eat and do affect the younger child, who is a vulnerable extension of themselves. Consequently, some neonatal food taboos are extended during early childhood. The vulnerability of a child's ***eshawa*** to the transgressive attacks of other ***eshawa*** encountered daily is consistent with the observation that children are the most common victims of illness (see chapter 9).

The process of physical growth, the development of the ***eyami***, is the result of nutrition and ultimately of socialization in the form of food, which is obtained through networks of exchange and social interaction. Moreover, Kimura suggests that physical contact results in contact of souls, so that "members of the same house or community possess some soul staffs in common" (ibid, 1985:493). Young children are talked of as being "green" or unripe, like undeveloped fruits. The physiological process of growth is accompanied by a simultaneous strengthening of the child's ***eshawa***: that is, development of ***eyami*** is concomitant to that of the ***eshawa***. Burr (ibid, 1997: 218) associates the vulnerability of infants with the fact that their 'sibling-spirit' ***edoe*** is not fully formed. These 'sibling-spirits' operate as "intentional fields-of-force" (ibid: 217), connecting peoples thoughts, actions and emotional states, in ways which can harm others and protect the self. That is, the ***eshawa*** of humans is represented by the existence of the sibling-spirit, ***edoe***.

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Weaning and walking mark critical transitions towards adulthood and greater self-reliance, which also imply the formation of a more resilient and better protected ***eshawa***. By the age of six, most children have economic responsibilities and may carry out adult-like tasks such as light a fire, cook, and take care of younger siblings. At this time, the dangerous transition between childhood and adulthood has proceeded to the point that many dietary restrictions no longer apply (cf. Seeger, 1981).

Death: *ekwikia*, *eshawa*, *kweyhana* and the *emánokwana*

After death, the ***eshawa*** of the person embarks on a long and arduous journey to ***kweyhana***, the world of the dead[11]. This journey takes place along a river or path, also referred to as ***kweyhana***[12]. The word's etymology (***kwey***=river) suggests that ***kweyhana*** is a river (Alvarez, 1950; Chavarría, 1996). Among the Sonene Ese Eja however, ***kweyhana*** is commonly likened to a straight path or

11. There is some evidence, including some verbal reports and a brief statement by Alvarez (1950:34), to suggest that the Ese Eja believe that following death three souls are released: ***ekwikia***, ***eshawa***- already discussed- and ***ena-shawa*** ("water-soul"). Whereas the ***eshawa*** eventually travels to ***emanokwana***, ***ena shawa*** travels to the depth of the water, where it exists under the control of the ***ena' edóskiana***.

12. For the sake of convenience I will refer to the former as the "***kweyhana*** path" and the latter as "***kweyhana***", although in actual conversation, the distinction between both is only apparent through the context in which the word is used.

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even road ("camino", "carretera")[13]. ***Eshawa*** travelling to ***kweyhana*** endure all sorts of hardships along the way. One friend for example, once cautioned us to avoid the house of ***bowí-sesé*** ("vomit-feces"), which stands at a particular place on the side of the path to kweyhana. Here, unsuspecting travelers are trapped into the condition of living amidst and consuming one's own feces and vomit.

The journey to ***kweyhana*** itself may take one to several years[14], and even though some ***eshawa*** have a longer and more arduous journey than others, all ***eshawa*** eventually end up in ***kweyhana***[15]. According to Burr, there are two distinguishable aspects or 'types' of eshawa, ***esowi-shawa*** ('voice/breath soul') and ***ekoja-shawa*** ("sight/vision soul"). Only the former makes its way to ***kweyhana***, leaving the body through the mouth. ***Ekoja-shawa*** reportedly leaves the body through the eyes and travels to the 'sky world' (ibid, 1997: 187).

Kweyhana is described as a vast region, "very very far away" (***kia wesha nei nei***). When pressed as to its location, a number of informants said "in another

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13. In effect, rivers, at least the lower navigable courses where the Ese Eja live today, are the avenues of communication that are used to travel between distant points. In this regard, "river" and "road" are semantically related.

14. Burr (1997: 219) suggests that the time it takes for the ***eshawa*** of the person to reach ***emanokwana*** approximates that for the body to decompose fully.

15. There appears to be no connection between one's actions during life in "this" world and the type of passage to ***emanokwana***. Thus, the ***Ese Eja*** have no concept of post life punishment or retribution for life's actions *per se*. Instead, one's transgressions against others can have repercussions as those transgressed can come back as ***emanokwana*** to seek revenge. This view is consistent with Ese Eja values associated with an egalitarian society with no centralized authority, where exchanges are constructed in terms of mutual acts of reciprocity.

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river" or "where the sun sets" or "upriver". Burr (1997: 186) highlights the connection between the headwaters and ***kweyhana***. The spatio-temporal alterity of the 'sky-ground' layer of the cosmos, itself a reflection of a mythical undifferentiated state between the sky and the earth (ibid: 185), may also be extended to ***kweyhana***. Here, the future, in the form of the destiny of death, merges with the past, and mythic unity is reestablished.

Kweyhana is in many ways a distinct space, reachable in theory but not in practice[16]. The ***eshawa*** of all living creatures return to ***kweyhana*** following their death. That is, at death the primordial order of the world is re-established, in that, leaving their ***eyami*** behind, ***eshawa*** of people, and of some animals and plants (those that were originally Ese Eja) continue their existence as Ese Eja. Once in ***kweyhana***, ***eshawa*** are also known as ***emanokwana*** ("the dead"). As I indicated above, ***kweyhana*** is a social space: the ***emanokwana*** inhabit a distinct location within the world of ***kweyhana***, just as they inhabit one in this world. A fundamental aspect of ***kweyhana*** and the ***emanokwana*** is that of a capacity for infinite and eternal replication, defined by the term ***japanakiani***.

> *" ...**japanakiani**...when we kill a chicken, [it] returns again [to **kweyhana**] as a chicken... when we die, we return again in kweyhana... [in the form of] **emanokwana**... when we cut the plantain tree [to harvest the plantain fruits] and throw away the*

16. Indeed, one of the mythological accounts describes how an ***Ese Eja***, missing his beloved partner, traveled to ***emanokwana*** eventually settling down and living there.

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*plantain skin...[that plantain] returns and grows again in **kweyhana...**"* (Sonene, 1995).

Once in ***kweyhana***, ***emanokwana*** are continuously reborn and re-created, and do not have to endure the hardships of illness or work, since all things, including swidden crops, regenerate spontaneously, and since ***eshawa*** are essentially immortal and hence indestructible. Otherwise, the ***emanokwana*** lead an existence which in many ways parallel that of the Sonene Ese Eja: they hunt, practice agriculture, have families, and continue to have children[17]. Moreover, the ***emanokwana*** are all under the control of the ***edósikiana***, in a way that is compared to the control of the now defunct "chiefs", ***etii***, over the Ese Eja in historical times.

Even though ***kweyhana*** is regarded as a distinct, and to most, inaccessible and invisible realm, the ***emanokwana*** do maintain relations of exchange with living Ese Eja. In chapter 5, I discussed the symbolic and material importance, especially in the past, of large white-lipped peccary herds, ***ño'***, which are seen by the Ese Eja as visiting ***emanokwana***.[18] In addition, there are a number of contexts- ritual times and spaces- where the Ese Eja can directly interact with

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17. Thus, an ***Ese Eja*** does not only have a complex web of kin relations among the living, but another, much larger and constantly growing, network of kin among the dead or the ***emanokwana*** (Peluso, Ph.D. thesis, in preparation).

18. The view that white-lipped peccaries are the souls of dead ancestors is found among other groups, e.g. Culina (Pollock, 1992:29). The social behavior of these animals is consistent with such a view: travelling in large herds, up to several hundred animals, white-lipped peccaries may cover enormous distances through the forest.

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the ***emanokwana*** as ***eshawa***, that is as Ese Eja instead of as ***ño'*** (white-lipped peccary). A number of communal rituals, including ***epowi sese***, ***emanokwana***[19], and ***eshasha-powi***, provide formal settings in which ***eshawa*** enter the social space of the community to exchange news, drink plantain or manioc beer and heal the living.

All of these rituals are mediated and hinge upon the ***eyámikekwa***, the Ese Eja "traditional" shaman. Sonene is the last and only community with an ***eyámikekwa***, so that outside of Sonene ***eshawa*** rituals exist only in the cultural memory of the Ese Eja. That is, outside of Sonene, the ***emanokwana*** have little direct interaction with the Ese Eja, the implications of which are considered in chapter 7.

The journey along ***kweyhana***, as the transition between the world of the living and that of the dead, is not just difficult and dangerous for the ***eshawa*** embarked on the journey, as exemplified by the presence of ***bowí–sesé***, but also entails certain risks for the living. While travelling through ***kweyhana***, the ***eshawa*** of the dead may return to their communities, often seeking the living and summoning them to the world of the dead, or at times actually attacking them by shooting them with their (invisible) arrows. One informant described these acts of aggression, occasionally directed even against kin and affines, as attempts of

19 The word ***emanokwana*** refers both to the souls of the dead and to a community ritual in which these "visit" the living.

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the ***eshawa*** to "revenge" the suffering and hardships endured by the person while alive.

The house and personal belongings of the deceased are burnt, and their name not spoken. Not all individuals pose equal risk to their kin following their death. Aggressiveness, assertiveness or shamanistic power are some of the traits of the living which belie a particularly powerful, and hence dangerous ***eshawa***. Likewise, the ***eshawa*** of adults are feared more than those of children. In the past, the death of an adult would lead to the relocation of the entire extended family, and that of the ***eyámikekwa*** of the entire community. Sedentism has somewhat curtailed this practice, though families frequently rebuild their houses elsewhere in the community or at least abandon the village for some time.

These measures serve to severe the links between the dead and living and mark the beginning of a dangerous period of transition, which continues until the ***eshawa*** of the deceased arrives to ***kweyhana***. Once the ***eshawa*** become ***emanokwana***: in other words, once the dead have fully entered the world of the dead, relations between the dead and the living can be purposively and constructively re-instated. Indeed, abundance of certain game and lack of sickness are seen as the product of viable and ongoing relationship between the dead and the living. It is no coincidence that the when the Ese Eja speak of the ***eshawa*** on ***kweyhana*** the image frequently given is that of an individual

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travelling alone, for this period of transition has a distinct asociality. Indeed, during this time, ***eshawa*** commit the most asocial acts (such as eating their feces and assaulting their kin). Upon arriving to ***kweyhana*** however, the ***eshawa*** are incorporated into the world of the dead, ***emanokwana***, which replicates in many ways the social structures of the living world. It is this condition of existing as a social entity that opens the possibility for social relations, both productive (ie. trade relations: abundance of game, curing the sick during certain rituals) and destructive (ie. war and illness).

The immediate explanation given by the deceased's relatives for physical relocation following death is to "forget". Remembering, and its concomitant feeling, deep sorrow, are potentially harmful as they, by association, bring death onto life and hence may effect a dangerous transgression. The dangerous aspect of memory is most manifest in the ***ekwikia***: a part of the person's soul associated with the deceased and thus found in the immediate surroundings of the burial site. ***Ekwikia***, translated into Peruvian Amazonian Spanish as "tunchi", is dangerous ghost or spirit which can bring about illness and death[20]. As a result, the deceased, burial sites, their objects and even their memory, are perceived by the Ese Eja as highly polluting, and hence generally avoided.

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20. Illness episodes among an American couple living in Portachuelo for example, were often attributed to the close proximity of their house to an old cemetery.

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Unlike the ***eshawa***, who can travel enormous distances, ***ekwikia*** are limited to the space around the ***eyami*** or corpse. In contrast to ***eshawa***, ***ekwikia*** have ephemeral existences: the power of the ***ekwikia*** becomes weaker as the memory of the person fades in the collective mind. Just as the ***eyami*** is literally and metaphorically "fed" and constructed by family and kin through "socially processed" (read cultivated, hunted and cooked) food, the ***ekwikia*** is metaphorically fed and depends on social memory.

Thus, while ***ekwikia*** is semantically related to ***eyami***, the house, family, community and in effect the body social, ***eshawa*** is semantically related to the ***edósikiana***, ***kweyhana***, mythical time, to the forest and to the social space of nature. Although both ***ekwikia*** and ***eshawa*** can hurt the living, this role is unambiguous among the ***ekwikia*** but highly ambivalent among the ***eshawa***, who play key roles in healing as well as in bringing illness. In other words, whereas ***eshawa*** have a social space distinct to that of the Ese Eja and hence meet the basic requirement for developing a relationship of exchange, ***ekwikia*** are doomed to remain in the social-less liminality of transition between two worlds, a state which for the Ese Eja is imbued with danger and transgression. Hence the ***eshawa*** on the road to ***kweyhana*** and the ***ekwikia*** are similar in that they embody asocial, liminal and dangerous states. Whereas ***eshawa*** are eventually incorporated into the social space of ***kweyhana***, ***ekwikia*** simply fade out of existence.

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These beliefs are found, with varying degrees of similarity, among other Amazonian horticultural and hunter-gatherer societies. Among the Yanomama for example, death of an individual results in the seperation of different parts of the soul. One of these, like the ***eshawa***, departs to a distant place, the "sky layer" in this case, where it leads a parallel existence to that lived by humans on the "earth layer" (Albert, 1988). Likewise, the ***uhudi*** remains as a wandering evil spirit, roaming through the forest, in some ways akin to the ***ekwikia***. Finally, all Yanomama posess a ***noreshi***, an alter-ego of the soul, which lives in the form of an animal in the forest, constantly duplicating the individuals' behavior. This is somewhat remeniscent of the Ese Eja ***edoe***, the 'sibling-spirit' which inhabits the underworld (Burr, 1997).

Inherent in this world view, which suggests parallel and interconnected spaces or levels of reality (cf. Chavarría, 1996), is a distinct sociality of nature. As several authors have noted, for Amazonians, nature is imbued with a sociality which, through its parallels and contrasts, mirrors that of humans (Descola, 1994; Viveiros de Castro, 1992). This central organizing principle is in turn based upon a logic of interdependance, eloquently summed by Albert (1993: 365):

> *"...[Amazonian societies]... render the cosmos as a social totality, ruled by a complex system of symbolic exchange between human*

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and non-human beings, where shamanism is the cornerstone..." (my translation).[21]

The *edósikiana* and the *eyámikekwa*

Ese Eja creation myths describe how the first division of the cosmos followed from the murder of the sloth ***bei'*** by her lover's older brother.[22] Finding his lover brutally murdered, the enraged younger brother began to stamp on the floor, wailing. This in turn caused the earth to separate, forming the sky. As the sky formed and seperated from the earth, the younger brother, together with the women, were seperated from the earth, where they remained until much later when they descended again to the earth along a cotton rope. The older brother, and the men according to some versions, then retreated deep into the forest, transforming themselves into ***edósikiana*** (Burr, 1997, Myth 1: 1.8).

Edósikiana are in a sense the masters of the forest. As with ***eshawa***, the term is semantically complex. The root [***dosi***] conveys the notion of spirit, master and caretaker of nature (Chavarría, 1996: 188). The plural suffix, [***–kiana***], indicates that there is not one but many ***edósikiana***. Chavarría (ibid) suggests that the

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21. " ...[les societées Amazoniennes]...qui font du cosmos une totalité sociale régie par un complexe système d'echanges symboliques entre sujets humains et non humains, don't le chamanisme est la pierre de touche.."

22. For accounts of different versions of this myth, see Burr (1997), Chavarría (1987; 1996), and Kimura (1981).

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use of ***edósikiana***, in the singular case is the product of missionary and Spanish monotheistic influence. Informants further distinguish between the "real" ***edósikiana***, ***edósikiana nei***, and a number of other ***edósikiana***. That is, the term corresponds to two hierarchichal taxonomic ranks: at a generic level, ***edósikiana*** refers to the ***eshawa*** of non-human beings, as the spirits or souls of animals and some plants. More specifically, it also refers to ***edósikiana nei***, the ally of the ***eyámikekwa*** and "master" of game animals, and, by extension, the forest, whose origin is traced back to the older brother in the mythic account of ***bei***[23].

Though mortal, the ***edósikiana*** are extremely long-lived[24]. Invisible to all but the ***eyámikekwa***, (anyone who sees the ***edósikiana*** is rapidly devoured by him), the ***edósikiana*** wear an anatto-dyed cotton "cushma" or ***daki nei*** (traditional attire, consisting of a knee long vest), have a crown of red and yellow macaw feathers (***boba***), carry a bow and arrow and wear face paint[25]. Thus, as would be expected, the physical appearance of the ***edósikiana*** is similar to that of the ***etiikiana***, the ancestors. This too is the attire of the ***eyámikekwa*** during such mythico-ritual celebrations as ***eshasha-powi***.

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23. Burr (1997) distinguishes between both forms of ***edósikiana*** by referring to them as ***edósikiana*** and ***Edósikiana*** respectively.

24. Burr (ibid.) notes that the ***eyámikekwa*** can kill marauding ***edósikiana***, and it is the corpses of dead ***edósikiana*** which sustain the vultures, ***be'o***.

25. Burr (1997: 210) adds small deer horns and 'the eyes of a madman' as additional prevalent images of ***edósikiana***. The former may relate to the mythic images of the ***dokwey*** and/or to the

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The ***edósikiana*** have families just like the Ese Eja, though their social space is different; their houses are in the forest, and are only visible to the ***eyámikekwa***. The ***edósikiana*** control many animals and plants as well as meteorological forces such as wind, rain, lightning, earthquakes and floods. Certain animals, such as the tapir, are their pets and are directly raised and taken care by them. In effect, the ***edósikiana*** embody the productive and destructive forces of nature. The ***edósikiana*** can also transform themselves into a number of birds, insects and mammals- namely deer- and hence have the power of mutability characteristic of mythical times.

Rivers are considered distinct spaces with equivalent ***edósikiana***, referred to as ***ena' edósikiana***, "water ***edósikiana***". However, the ***ena' edósikiana*** are not as prevalent in Ese Eja mythical and medical narratives as the ***edósikiana nei***.

The concept of the ***edósikiana*** as a "master of animals" finds its equivalents among many Amerindian societies. This includes ***pulowi*** among the Guajiro (Perrin, 1987), ***vaí-mahse*** among the Desana (Reichel-Dolmatoff, 1971), ***pa'reni*** among the Matsigenka (Baer, 1992), and ***hea*** among the Sanema (Colchester, 1982).

Christian influences through the image of the devil, with whom ***edósikiana*** are frequently compared (ibid: 210).

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Just as the Ese Eja depend on the animals of the ***edósikiana*** as food, the ***edósikiana*** depend on the Ese Eja for their survival. ***Edósikiana*** "shoot" the Ese Eja with their bows and arrows to eat them, just as the Ese Eja shoot and feed on the animals of the ***edósikiana***. Thus, the Ese Eja and the ***edósikiana*** co-exist in a circle of mutual dependence marked by death and predation.

The ***edósikiana nei*** can "shoot an arrow" into an Ese Eja to make him into an ***eyámikekwa***, or shaman. The arduous and intensely painful (***kia nee***) initiatory experience, which includes the dismemberment and ingestion of the person's ***eshawa*** by the ***edósikiana***, results in the formation of the ***eyámikekwa*** who in many ways represents the ***edósikiana*** among the Ese Eja.

The ***edósikiana*** and the ***eyámikekwa*** establish what is in effect a reciprocal relationship. By becoming trading partners and friends, ***epeeji***, they are mutually obligated to each other (Kimura, 1981). The ***edósikiana*** gives the ***eyámikekwa*** the power to remove the pathogenic arrow tips shot by other ***edósikiana***, warns of impending attacks of ***eshawa*** or of cultural norms violated, and is not "stingy" with "his" game. In exchange, the ***eyámikekwa*** mobilizes the community resources in the making of plantain beer, which is offered to the ***edósikiana*** during the ***eshasha-powi*** ritual.

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When the *eshawa* raid the Ese Eja

Occasionally, ***eshawa*** come from "far away" to raid and "eat" the Ese Eja[26]. Sometimes they are brought by the wind, in which case they are referred to as having the appearance of dust or smoke. These pathogenic ***eshawa*** carry the names of the illness they bring. Thus, ***see-see*** (diarrhea), ***oho*** (coughs), ***wishi*** (literally "snot", but more generally refers to congestion, mucus and sneezing), ***kiyo-kiyo*** (fever), ***bowí*** (vomit), and ***sapa nee*** (headache), are all "Ese Eja" in the sense they, or their ***eshawa***, adopt the human form of the ***edósikiana***, though this is only visible to the ***eyámikekwa***. In addition, these ***eshawa***, like all ***eshawa***, lead a human-like or social existence in their "homes". Several Ese Eja have explained to me that these beings normally live "far away" (***kia wesha nee nee***), in "the headwaters" (***eyobiho***). Several accounts directly link these ***eshawa*** to the ***emanokwana.*** In the case of ***wo'o*** (smallpox) and ***chíji*** (measles) these attacks are often deadly.

The fact that these illnesses "live" far away is consistent with the sporadic occurence of these infectious diseases. ***Eshawa*** and illnesses are "wild" in that they live deep in the forest or the headwaters. In once occasion, when everyone in the community was getting sick with respiratory infections over a long period of time, a friend expressed concern and frustration, saying "this illness is becoming

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26. Taylor (1976) reports a similar perception among the Venezuelan Sanumá. Malaria and other illnesses are perceived as 'attacks" from evil spirits living far away. Albert (1988) has explored this theme in more detail among the related Yanomami.

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tame" (***ewonei***). That is, the pathogenic eshawa were settling in, as opposed to merely "raiding".

These onslaughts of illness are often attributed indirectly to the ***edósikiana***, who have the power and the somewhat capricious malevolent desire, to send ***eshawa*** to "attack" the Ese Eja. In doing so, the ***eshawa*** become and may be referred to as ***edósikiana***.

The likelihood of such epidemic attacks is considered to be greater when the ***edósikiana*** are angered by certain transgressive acts, or when there is a breakdown in the system of exchange and reciprocity between the ***edósikiana*** and the Ese Eja. Likewise, the destructive forces of nature, floods, droughts and fierce winds, are all manifestations of the ***edósikiana***. It is in this context that rituals such as ***emanokwana, epowi sese,*** and ***eshasha powi*** (see chapter 7), acquire paramount importance, as means of establishing and maintaining viable relations with the ***eshawa*** and with the ***edósikiana***, thus preventing the onslaught of epidemic illness and natural disasters. In effect, outbreaks of infectious diseases in Sonene, most frequently respiratory infections, often led to the successive enactment of these various rituals.

The ***eyámikekwa***'s unique role as the intermediary between the Ese Eja and the ***edósikiana*** means that he becomes a critically important agent for preventing the onslaught of disease, at least of diseases perceived to originate from the

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forest[27]. The fact that, according to the Ese Eja, there are more illnesses today than in the past is seen as evidence of the lack of ***eyámikekwa***. A recent outbreak of measles in Palma Real was attributed to the fact that this community no longer has an ***eyámikekwa*** to protect it.

Whereas outbreaks respiratory or other viral infections can wreak havoc, and in the past decimated the Ese Eja population, their today occurrence is sporadic and rare. As with other Amazonians (e.g. see Colchester, 1982, for the Sanema; Seeger, 1981, for the Suya), most common illness episodes are attributed to dietary transgressions, where inadequate foods are consumed, or where adequate foods are inadequately procured, prepared or consumed. Instances of illnesses due to transgression of food regulations and through pollution are also constructed and explained through the logic of the ***eshawa***, and couched in a logic of social and economic relations.

As with epidemic outbursts, individual or isolated cases of illness are also thought of as the result of ***eshawa*** predating on humans, though the social contexts in each case are different. Epidemics suggest that eshawa are raiding the village as a group, and responsibility for this misfortune is often directed at the whole community. An influenza epidemic in Sonene for example, was

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27. Ayahuasca ceremonies are also used as means to send away or deflect the attack of these raiding ***eshawa***, and the significance of this and its relationship to ***eyámikekwa*** shamanism are discussed more fully in Chapter 7.

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attributed to the community's negligence in mobilizing its resources and organize an ***eshasha-poi*** in a timely manner.

Isolated cases of illness on the other hand are due to the attack of a single eshawa, and here responsibility lies usually within the domain of the patient or his/her close kin. Typically, these isolated attacks are the result of individual negligence, particularly in the context of diet and sex.

Food prohibitions: *kia' aja, kia' nee*

The category of ***kia' aja*** in the case of plants and ***kia' nee*** for animals, denotes a potentially polluting quality in certain foods. The Ese Eja consider these plants and animals to have particularly "strong" or aggressive (***kia mase***) ***eshawa***, which parents and young children are supposed to avoid. Eating, harvesting or killing these species may result in sickness, and possibly even death, of the child. While most of these segmentary food taboos (cf. Begossi, 1998) apply to both pregnancy and early child raising, some are restricted only to the former. The concept, roughly equivalent to the Ribereño concept of "cutipado", is seen as one of the most common causes for a wide range of symptoms among children, including gastro-intestinal disorders, fever, rashes, skin fungal infections, sores and conjunctivitis.

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The status of ***kia'aja*** and ***kia' nee*** for plants and animals is frequently associated with certain distinct visible features. For example, the fruit ***micha*** (*Annona muricata* L., Annonaceae) may cause ***sapa chihi***. The appearance of this skin condition,[28] a proliferation of bulgy sores in the scalps of toddlers and small children, resembles the reticulated skin of the fruit. Likewise, ***hawa-hawa*** (*Curcuma domestica* Valeton), is thought to give children jaundice (***hawa-hawa***), the symptoms of which are associated to the yellowish skin color of the tubers.

This type of associative logic underscores Ese Eja theories of causation and is prevalent in ethnobotany and ethnomedicine (see Chapter 8). In one of the first systematic and comparative studies of magic, Frazer (1922) distinguished between homeopathic magic, based on the principle of influence through similarity[29], and contagious magic, effected through physical contact. The Ese Eja use such "theories of correspondence" (Burr, 1997) to infer cause and effect relationships between apparently unrelated events and processes. Subsequently, many authors have highlighted its particular relevance to many systems of indigenous medical logic and behavior (e.g. Albert, 1993; Evans-Pritchard, 1976; Larrick et al., 1979; Turner, 1967, and others).

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28. Possibly a fungal infection.
29. The "doctrine of signatures", a theory utilized widely in Europe in the middle ages to identify and explain the medicinal or poisonous properties of plants, is an example of homeopathic magic.

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The concepts of ***kia aja*** and ***kia nee*** serve as important means to categorize edible plants and animals. When asked why certain organisms are polluting, the Ese Eja usually respond that "it is of the ancestors, they told us"[30] Knowledge of food taboos then is identified as cultural knowledge transmitted across generations. Of course, the fact that most foodstuffs are considered ***kia aja***, might suggest the need to phrase the question in the inverse: what attributes of the plant or animal make it ***yaja 'ama*** or ***nee-ama'***, not polluting! If an individual is unsure about the status of a foodstuff, as in the case of an exotic fruit brought in by the ethnobotanist, or a rare fish, for example, the person might look for certain clues in the physical appearance or characteristics of the organism, in an attempt to classify it. In cases when individuals are not sure, elders, usually women, or the ***eyámikekwa***, are consulted.

Not all plants and animals under this category are equally polluting. Because some have "stronger" ***eshawa*** than others, some species are more ***kia'aja*** or ***kia'nee*** than others. Thus, Ese Eja adults not only have to know what category each foodstuff is in, but also the degree to which each foodstuff belongs to a specific category. The paca or ***se'ao*** (*Agouti paca*) is unanimously cited as being "very" ***kia nee***, whereas the related agouti, ***chawijani*** (*Dasyprocta variegata*) is only a "little". In other cases, particularly when the foods are only "a little" ***kia' nee*** or ***kia 'aja***, there is some variability in how these are categorized.

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30 "...es cosa de los antiguos...ellos nos han avisado."

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This variability is partly due to the fact that some individual children are believed to be more susceptible to polluting foodstuffs than others: just as some people have greater physical strength than others, some individual ***eshawa*** are stronger than others. We have frequently noted that parents will often experiment with prohibited foods, certainly the least dangerous ones, and thus to a degree customize culturally appropriate practices according to specific circumstances.

Although never stated explicitly, it seems that polluting organisms are often associated with certain physical or behavioral attributes. Red, purple and yellow colors, particularly if they stain in the case of plants, are often associated with polluting foodstuffs, as are the presence of spines. Red or purple fruits and foodstuffs, including such colored varieties of plantains and edible tubers, are unanimously classed as ***kia aja***. Red and yellow are clearly associated with the ***edósikiana***, who wears an anatto-dyed ochre cotton ***daki*** [31] and a yellow and red crown of feathers (***bo'ba***).

Seeger (1981) and Pollock (1994) note that among the Suya and Culina respectively, odors are used in the categorization of plants and animals in terms of how "dangerous" or polluting they are considered to be. It is possible that odor is also used by the Ese Eja in similar ways, though I have collected no concrete evidence in this regard.

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31. ***Daki*** is generic word for clothing, though strictly speaking it refers to ***daki nei***, the knee-length vest traditionally worn by Ese Eja adults.

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Plants which contain milky exudates (***ema'i***), such as ***etona*** (*Ficus insipida* Willd., Moraceae), ***esíe*** (papaya, *Carica papaya* L., Caricaceae), and ***wapa-wapa*** or "piñón colorado" (*Jatropha gossypifolia* L., Euphorbiaceae) are all ***kia'aja*** for example[32]. The presence of a slimy mucous secretion on the skin of all catfish may also be related to their unequivocal status as ***kia nee,*** though I never posited the question directly. These instances suggest a sexual connotation to the concept of pollution. Not only is the term for milky exudate, ***ema'i***, the same as that for sperm, but when referring to the process whereby polluting foods cause illness, sexual language and images are frequently used, notably that of the ***eshawa*** of the plant or animal raping or copulating with (***kojo***) the ***eshawa*** of the victim.

The concept of food pollution, then, is linked to the notion that plants and animals, or more correctly their ***eshawa***, can commit acts of aggression, often sexual aggression, particularly if certain conditions or rules are violated. That is, violation of the rules for appropriate dietary behavior leads to a reciprocal violation of the perpetrator's integrity (either directly to him/her or his/her offspring).

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32. Duke (1970) reports similar pregnancy dietary restrictions on lactiferous fruits in the Colombian Chocó.

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The fact that most "wild" (read non-socialized) organisms are polluting might indicate or be related to an association between wildness and sexual energy. The link between wildness and physical or sexual aggression is best symbolized by the jaguar, ***iba'***, whose ***eshawa*** is feared for its sexual voracity, just as the animal is feared for its physical voracity (cf. Reichel-Dolmatoff, 1971, for the Desana). Likewise, the ***edósikiana***, the embodiment of the forest and its wildness, has an aggressive nature whose origin can be traced back to his murdering his brother's lover, ***bei***. Incidentally, the ***edósikiana*** is also associated with extraordinary growth and with replication: we have already seen for example, how the capacity to replicate *ad infinitum* is characteristic of the ***eshawa*** and hence of the ***edósikiana***. This in turn may explain why rapidly-growing plants, such as plantains and maize, are seen as being associated to the ***edósikiana***.

In other instances, the sexual symbolism associated with illness does not emphasize the act of sexual aggression, as much as that of inappropriate co-habitation. This is the case with, ***jemí-kaní*** the pathogenic effect exerted by some animals, such as catfish (***hai***) and large snakes, as well as certain trees, such as *Ceiba pentandra* (***wechi***). The ***eshawa*** of these organisms can "kidnap" the ***eshawa*** of toddlers or pregnant women, an action translated by informants as "loving" ("le aman"). "Loving" in this context has a sexual connotation, implying cohabitation, but also that of raising, and being adopted into another social world. Thus, the ***eshawa*** can "kidnap" and subsequently

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cohabit with the Ese Eja ***eshawa*** just as raiding parties of "wild" Indians (including at one time, the Ese Eja) would raid other groups to steal their women, or just as ***deja,*** would raid the Ese Eja to capture children and take them as laborers during the rubber boom.

In one instance, a child in the Ese Eja community of Palma Real drowned while playing with his friends in the river. During a subsequent ***emanokwana*** session, a visiting ***emanokwana*** reported that the child had not drowned, but that the ***enashawa*** or ***ena'edósikiana,*** the ***edósikiana*** of the water, had taken him its underwater home[33]. Even though the parents would never see the child again, for no ***eyámikekwa*** today has the power to retrieve a person from the realm of enashawa, they knew that he was alive and well.

In his analysis of Desana myths, Reichel-Dolmatoff (1971) suggests that food regulations have a distinct sexual symbolism, through which the prescription of marriage rules and avoidance of incest is emphasized. That is, perceptions of natural resources mirror social categories (Fratkin, 1996).

Sex and food: *bañekwe* and *bañejima*

33. Drowning is only believed to have taken place when the corpse of the victim is found (Peluso, pers. comm., 1998).

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Individuals must abstain from sexual intercourse following collection or harvesting of most cultivated plants and hunting of all wild animals. This abstinence must continue until all that was collected is either eaten or discarded. The term ***bañékwe*** refers both to the practice of sexual abstinence required to prevent food pollution, and to the condition of food which has been adequately collected. The negative form of the term on the other hand, ***bañéjima***, indicates both the transgressive act and the consequent polluted state of the food. Combining food and sex implies a transgression which has distinct pathogenic repercussions associated with the contamination of food and, concomittantly, sexual assault. Again, this can be best understood in terms of the nature of ***eshawa*** and the relations between Ese Eja ***eshawa*** and the ***eshawa*** of food plants and animals. In order to understand the logic and meaning behind ***bañekwe*** it is first necessary to understand how the actual process of procuring food is viewed.

Throughout Amazonia, food procurement, and hunting in particular, are activities which are frequently loaded with sexual imagery. The hunt is likened in many ways to the act of courtship, as the hunter persistently follows his prey, and as the prey, calls and "makes itself available" to the hunter (e.g. Brown, 1984: 67ff; Carneiro, 1970b:130; Kensinger, 1983; Reichel-Dolmatoff, 1971;220). According to the Ese Eja, game animals communicate to the hunter their readiness to be hunted in dreams, whose content is frequently sexual. Moreover, I have heard hunters utilize sexually explicit language when referring to their prey and to the

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act of killing by "piercing" [***kekwa***]. In order for the hunt, that is the seduction of prey, to be successful, the hunter has to abstain from sexual intercourse beforehand.

Cooking and eating are also rich in sexual imagery. Gifts of meat from a hunter to a woman not within his network of exchange are seen as signs of clear sexual interest. In many societies, including the Ese Eja, the procurement of meat is regarded as a condition for the procurement of sexual favors; that is, men and women "exchange" meat for sex (e.g. Kensinger, 1995; Siskind, 1973).

The hunter is engaged with the animal, read the ***eshawa*** of the animal, in a process of sexual courtship, which only ends after the meat has been entirely consumed, that is, assimilated into the social body. Having intercourse while meat from the hunt is still not consumed pollutes the meat, rendering it pathogenic. In effect, the sexual act of the hunter incites the retaliation of the animal's ***eshawa***, which attacks the ***eshawa*** of those who eat it. Again, this attack is often pictured in terms of sexual assault.

One is thus reminded of the original scene in the Ese Eja creation myth. Here, the younger of two brothers has an adulterous lover in the forest, Bei', to whom he takes the meat of his hunts. Hence, the exchange of meat and sex occurs between this man and his lover, instead of between him and his wife, the legitimate partner of such an exchange (Chavarría, 1996). The hunter's

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inappropriate sexual behavior incites the jealous rage of his older brother, who ultimately murders ***Bei'***. By drawing a link between inappropriate sexual activity and retaliatory violence, and through the symbolic association between food and sex, the myth of ***Bei'*** underscores the economy of sex, food and illness that permeates Ese Eja subsistence, medicine and cosmology.

Even if an Ese Eja has no children and is thus not circumscribed by dietary prohibitions, excessive consumption of ***kia 'aja*** or ***kia nee*** foods, even if they are ***bañekue*** (procured and prepared according to cultural norms to avoid their pollution), can lead to illness. This supports the notion that the ***eshawa*** of these foods are particularly strong or "fierce" (***kia mase***), and thus potentially dangerous to interact with[34], and that excesses of any sort are likely to lead to retributive actions.

Looking, touching and eating are increasingly intense forms of contact with other beings, and by extension their ***eshawa***, and as such entail different levels of risk. The level of danger is not only a function of the intensity of contact between Ese Eja ***eshawa*** and that of surrounding plants or animals, but also of the particular "strength" of each foodstuff. As I stated above, a newborn's ***eshawa*** is considered to be so weak that it is vulnerable to the prolonged gaze of an adult's ***eshawa***. Likewise, some organisms have such powerful or fierce ***eshawa*** that

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any physical contact with the organism, even by adults, is avoided. Ese Eja for example are very careful not to touch any snakes, even when they know they are not poisonous. Likewise, certain plants such as ***akwi iña*** (*Sloanea* sp., Elaeocarpaceae) are avoided, as they are considered "poison", even though these are not urticating or harmful in any apparent way.

Eshawa, like the Ese Eja, carry bows and arrows, and it is with these that Ese Eja "are hunted". Some plants, including plantains, manioc and maize are seen as "fierce" (***kia mase***), and prone to attacking those passing by, particularly if they are "strangers". When ***eshawa*** act as aggressors, they are also referred to as ***edósikiana***.

"Daño de gente" and sorcery

Up to now we have seen that most episodes of illness are attributed to be the consequence of violation of dietary restrictions. We have also seen that dietary behavior and its violation has an important sexual symbolism, and that illness is seen as a form of attack or retribution from the forces of nature, following a behavioral transgression. That is, when the codes of appropriate conduct and exchange with nature are violated, retribution in the form of illnesses occur.

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34. The presence of these dietary taboos have important implications for Ese Eja social organization, including distribution of labor, resource utilization patterns and to systems of exchange.

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Whereas ailments resulting from minor dietary violations ere either left untreated or are treated with medicinals, more serious episodes, involving either serious life-threatening, unusual, or persistent symptoms, are seen as signs of more serious conditions. Specialist help is frequently sought in these cases (see Chapter 8).

Serious, recurrent or unusual illness symptoms may also be seen to result from another form of aggression: sorcery effected by the ***eshawa*** of plants, through the mediation of a human agent. Sorcery can take a number of forms. Typically, the perpetrator will steal a piece of clothing, hair or any object which has the ***eshawa*** of the victim, and bury it on the base of any one of a number tree species. Through a principle of contagion, the ***eshawa*** of the plant, will "punish", "cohabit" or "eat" the ***eshawa*** of the victim. Particular symptoms are often associated with different trees. Sorcery with *Ceiba spp.* (Bombacaceae), for example, causes the swelling of the victim, a condition which on one case was medically diagnosed by hospital workers as water retention through kidney malfunction. The Ese Eja word for sorcery ***kwiahea***[35], is used synonymously with the Spanish term "daño", or more frequently, "daño de gente". The latter implies that sorcery is associated to ***deja***. In Sonene, all of the reported cases of sorcery we witnessed or heard about involved ***deja***, though Ese Eja may also be

35. ***Kwiahea*** is a generic terms, and includes several forms of sorcery. ***Kwia' niñe*** for example, is a type of sorcery associated with seizures or epilepsy.

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accused. Plant-sorcery, ***kwia'kani*** is essentially akin to ***jemí-kaní***, except that the latter refers mostly to animals, and does not include the intentful act of sorcery from a human actor.

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Chapter 7.

Ese Eja Shamanism

Introduction

Shamanism refers to a religious complex whose psychological, social, cultural, political, ecological and ethnobotanical attributes have been examined in a broad range of geographical and theoretical contexts. [1] Once associated most commonly in band and tribal societies, it has become an increasingly urban and cosmopolitan phenomenon (e.g. Dobkin de Rios, 1973; Ott, 1995).

The term shaman is originally derived from the Russian word for Tungus ***saman***, "the one who is excited, moved or raised" (Eliade, 1964). The ethnological scope of shamanism has been subject to much debate. As the etymology of the term implies, shamanism is strictly associated with the cultures of Siberia, and a number of scholars have argued that the term should be restricted to this culture area. In contrast, Eliade (ibid.) recognized shamanism as an archetypal phenomenon found in "primitive" societies in the Americas, Southeast Asia and Oceania, Europe and Africa. Although the notion of shamanism as an archetypal phenomenon is strongly disputed in contemporary anthropology, its occurrence

1. For recent reviews on the status of the study of shamanism in anthropology, see Atkinson, 1992; Langdon and Baer, 1992, and Thomas and Humphrey, 1994.

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within a broad range of societies is widely recognized and accepted by most schools of thought.

This chapter presents an overview of the principal ritual, epistemological, ethnobotanical and social characteristics of Ese Eja shamanism. As most other Ese Eja cultural institutions, Ese Eja shamanism is undergoing dramatic and rapid changes. The most evident of these is the decline of a "traditional" form of shamanism, which I will refer to as ***eyámikekwa*** shamanism, and the concomitant emergence of a related yet distinct shamanistic syndrome, herein referred to a ***ayahuasca*** shamanism[2]. Oral accounts suggest that ***eyámikekwa*** shamanism entered into sharp decline at around the time when the Ese Eja began to become widely sedentized and develop deep links of interdependence with regional markets and culture, including Dominican and evangelical missionaries.

This period also marked the incorporation of the hallucinogenic vine *Banisteriopsis caapi* (Spruce ex Griseb.) Morton (Malpighiaceae), and its admixtures, the defining aspect of ***ayahuasca*** shamanism. I argue that while both shamanistic systems are based on common symbolic referents, each emphasizes different aspects of the relationship between the Ese Eja and their

2. Whereas ***eyámikekwa*** and ayahuasca are categories used by the Ese Eja to identify and distinguish between two systems of healing, the category of "shamanism" is to an extent an analytical one. However, the Ese Eja do refer to healers, including ayahuasca shamans, as "curanderos". Moreover, "curanderos" are grouped together with ***eyámikekwa*** under a larger, albeit unnamed, taxonomic rank, which would be equivalent to that of "shaman".

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surrounding environment. Building on the arguments and evidence presented in chapter 6, namely that Ese Eja medical beliefs express social and ecological views, I suggest an explanation for the dynamic changes in Ese Eja shamanism, and discuss some of its broader theoretical implications.

For the sake of convenience, I will first describe the basic characteristics of ***eyámikekwa*** shamanism. The responsibilities of the eyámikekwa include preventing the onset and curing certain illnesses, and ensuring the availability of game and general well being among his kin and extended kin. The role of the ***eyámikekwa*** is contingent on a fragile but powerful relationship with ***edósikiana***. I propose that ***eyámikekwa*** shamanism is primarily focused on Ese Eja interactions with the forest and with game, in contexts which symbolically and explicitly exclude ***deja*** elements.

In contrast, ayahuasca shamanism effectively incorporates and manipulates ***deja*** elements and focuses on Ese Eja interactions with ***eshawa***, and most notably trees. The link between ayahuasca and ***deja*** is explicit both in that it is a recently introduced ritual, and that its symbolism is imbued with the language and images of contact with external actors. Changes in the Ese Eja shamanism system thus reflect ongoing changes in Ese Eja social and ecological relations. This in turn is signaled by a shift away from a semi-nomadic, hunter-gathering lifestyle towards an increasingly sedentary existence characterized by intensified interactions with

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plants and with ***deja***. Within this context, plants in general, and some plants in particular, become powerful symbols of Ese Eja contemporary reality.

Shamanism in anthropology and ethnobotany

The complex interrelationships between shamanism, myth, ritual and social organization, together with the subjective nature of shamanism, tend to make analytical approaches to this area of study difficult. Whereas secular material culture is highly communicable, sacred culture and altered states of consciousness are not easily defined, described, or explained in any cultural context.

Historically, shamanistic practices were often regarded, together with magic and curing, as a medley of disconnected and meaningless customs, characteristic of a "prescientific" mentality. Many of the early studies on shamanism focused on the shaman as a "deviant" from the matrix defined as "normal" human conduct and belief (Eliade, 1964:23ff). This was consistent with the theoretical conundrum of shamanism in anthropology; the apparently inextricable mix of idiosyncratic psychic elements with purely social ones. Evans-Pritchard's (1937) study of magic among the African Azande exemplifies a shift in approach by showing how divination, magic, and witchcraft are part of an integrated, coherent, and logical system of ideas and practices, which provide consistent means of explaining illness and other misfortunes.

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Studies of shamanic roles, beliefs, rituals, symbols, and cures have been undertaken by workers approaching the subject area from phenomenological, social anthropological, structuralist, symbolic, or psychiatric viewpoints, but to date there have been no successful attempts to provide a synthetic overview. The 'shaman-as-schizophrenic personality' approach characterized many of the studies during the 1940's and 1950's, at a time when personality studies were considered, especially in American anthropology, to be a valuable means for acquiring insight into culture. By stressing the shaman's personality, however, it is easy to obscure that which arguably is truly significant: "the creation and management of individually therapeutic and social consequential symbols and the ritual context of their dramatic presentation" (Robinson 1979).

The phenomenological approach on the other hand, epitomized by Eliade (1964), focuses on the identification of criteria to support a comparative analysis of shamanism. Eliade distinguishes between the experience of ecstasy, which he identifies as the primary phenomenon of shamanism, and its cultural interpretation. Whereas the former, he argues, is a primordial, non-historical phenomenon, the latter is subject to change through time. It is the presence of these primordial phenomena which makes hierophanies (any manifestation of the sacred in its totality) structurally equivalent and analyzable, independent of the cultural or historical context in which they are found. For Eliade, the presence of these hierophanies made shamanism in different societies analytically equivalent. Although this approach has served to underline some important aspects of

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shamanism, it appears somewhat idealistic and rigid, and is unable to describe shamanism within its broader social and historical context.

Structuralist approaches to shamanism have focused on providing an explanation for the "workings" of shamanism. This approach is based on the notion that shamanism is grounded in magical or mythical thought, and as such possesses a structure which represent certain fundamental categories of the mind, rendering them available to our perception and analysis. Lévi-Strauss (e.g.1963a, 1963b) for example, suggests shamanism relies essentially on the efficacious manipulation of symbols which, embedded in a particular cultural context, correspond to an underlying physiological reality. According to this perspective, the healer effects a cure by providing structure and order to apparent chaos (illness) as well as providing psychological catharsis (see also La Barre, 1964).

The sociological perspective propounded by Lewis (1971) is more amenable to empirical observation and confirmation than the two preceding approaches, and is based on the notion that mystical experience, like any experience, is grounded in a particular social environment. Lewis sees ecstasy primarily as a social fact, and only secondarily as an expression of personal transcendence and/or consciousness. Without questioning the validity of mystical powers, Lewis focuses on "the particular social and other conditions which encourage the development of an ecstatic emphasis in religion." A similar approach is illustrated by Robinson (1979) when he suggests that shamanism ritually and ideologically organizes the

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sociocultural information relating to events such as hunting and sickness, and as such can be construed as a social pattern of ritual exchanges interpretable within a structure of meanings. In this way he argues, shamanism may be conceptualized as a total system and a model for the social analysis of social relations.

The political implications of shamanism have also received increased attention, in terms of social control (e.g. Dole, 1964), internal community dynamics and conflicts (e.g. Brown, 1988), and in the context of inter-cultural contact and exchanges between indigenous peoples and colonialism (e.g. Langdon, 1985; Salomon, 1983; Whitten, 1976). As with other subdisciplines in the social sciences, studies of shamanism have increasingly developed a historical approach. That is, unlike the earliest analysis of shamanism which focussed on the purely ideological or psychological aspects of healing, the focus has shifted on the relationship between shamanism and the broader social and economic universe within which it exists.

In his examination of shamanism in the Putumayo for example, Taussig (1987) illustrates the powerful influence that the colonization process, and notably the rubber boom, had in molding the form and content of the rituals and language used in healing. More recently, Gow (1994) has suggested that the form and content of ayahuasca healing in parts of western Amazonia, is the product of a specific colonial history associated with the rubber boom. Specifically, Gow suggests that in certain areas at least, ayahuasca spread from urban centers to indigenous

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societies, and not the converse, as is widely held. Certainly, as we shall see, data from Madre de Dios lends support to this hypothesis.

Shamanism has also been extensively examined by ethnobotanists, particularly in connection with the use of hallucinogens (e.g. La Barre, 1938; Furst, 1990; Schultes and Hofmann, 1979). These studies have focused on the chemistry and physiological mechanisms associated with the hallucinatory experience (e.g. McKenna et al., 1995; Schultes and Hofmann, 1980), as well as on the cultural interpretations and significance of plant-induced trance-states (e.g. La Barre, 1990; Naranjo, 1973). In my examination of Ese Eja shamanism, I will try to illustrate the value of several of these approaches in illuminating different aspects of Ese Eja shamanism and ethnobotany.

Eyámikekwa shamanism

Characteristics of *eyámikekwa* shamanism

The term ***eyámikekwa*** is a compound of two morphemes, a noun and a verb. As we saw in chapter 6, ***eyami*** refers to the body, which is seen as physically tangible but ephemeral envelope for the ***eshawa***, or soul. The verb [***kekwa***] on the other hand, is polysemous, and it refers to a number of actions, all related to piercing. Thus, it is used for actions such as spearing, shooting an arrow or driving a nail into a board or a stake into the ground. The transitive nature of the

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verb, and the connotations surrounding its use, emphasize the intent-full action of the piercing, active subject. By extension, the term also means to hunt or to kill, as both imply a piercing action[3]. The term thus relates to a central image in ***eyámikekwa*** shamanism, that of ***edósikiana*** shooting invisible arrows into the Ese Eja, which are subsequently removed by the ***eyámikekwa***.

The "arrows", ***emehe***, that the ***edósikiana*** use to shoot the Ese Eja are invisible to all but the ***eyámikekwa***. The "arrows" of the ***edósikiana***", appear, in the hands of the ***eyámikekwa***, as wooden splinters ranging in size from a few millimeters to a centimeter or more. This transformation between the ordinarily invisible and the visible epitomizes the role of the ***eyámikekwa*** as an intermediary between the ***edósikiana*** and the Ese Eja.

When a patient is suspected of having been "pierced", ***kekwakanahe*** or "chonteado" in Spanish, s/he is brought in by relatives to the house of the ***eyámikekwa***, usually in the evening. In more serious cases, the ***eyámikekwa*** may visit the patient in his or her bed, usually in the early evening, though in emergencies a temporary may be carried out during the day.

The curing session begins with the ***eyámikekwa*** smoking tobacco, either in a hand rolled cigarette or, more recently, in a pipe. Even if tobacco is not

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3. The recent use of guns does not change the semantic value of the word, since guns kill by sending a projectile into the body. Indeed, the term for gun, ***ecowiji***, is also used for bow.

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available, curing can proceed. After a short while, the ***eyámikekwa*** begins to rub the patient's body, usually where there is pain. The intercostal area and nape are frequently rubbed too, as these are thought to be prime targets for ***eshawa*** "arrows". The movements, broad and gentle at first, become more intense as greater pressure is applied over a decreasing concentric region. Tobacco is intermittently blown into the area in quick, sharp bursts. After a few minutes, the ***eyámikekwa*** may begin to pinch and pull an area of skin, using his thumb, fore and index fingers. In the end, he produces in his palm a short wooden splinter, typically a fragment of *Bactris gasipaes* or a slither of *Guadua weberbaueri* , the same materials from which Ese Eja arrowheads are made. In some instances, these "arrows" are reportedly covered in blood.

The procedure may then be repeated, and several "arrows" extracted from different parts of the body. The more the "arrows" removed, or the larger the splinters, the more serious the condition is thought to be. A family member then takes the splinters away and carefully burns them, in effect symbolizing the total removal and destruction of the illness. The ***eyámikekwa*** may then instruct a family member to rub salt over the "wound" where the invisible arrow was lodged. Plants are generally not involved, either during or after an ***eyámikekwa*** curing session, at least not in terms of the healer's specific actions and recommendations.

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Furthermore, and unlike many Amazonian shamans, the ***eyámikekwa*** does not ingest or utilize any substances or beverages[4], aside from smoking tobacco during the actual healing. Even smoking tobacco may be a fairly recent incorporation: some Ese Eja claim to have obtained the plant following contact with other neighboring groups, and to have only started to smoke it following contact with ***deja***. Tobacco was used ancestrally as a snuff, connected to hunting (e.g. Zeleny 1976: 103). It is thus quite possible that its ritual use, as a snuff as opposed to a smoking substance, extended into other ritual contexts. Aza (1930) reports the Ese Eja have two types of healers. His descriptions of one type correspond to the ***eyámikekwa***, curing by sucking invisible arrows from the patient. The other is, or was, a tobacco specialist who deals with animal bites. To date, I have not been able to corroborate the existence of the latter type of healer.

The Ese Eja manifest a certain pride in the fact that ***eyámikekwa*** did not employ any "mind-altering" substances, citing it as proof of their imminent power: "...the ***eyámikekwa*** does not take [drink] anything...[he] cures only through... the ***edósikiana***" [5]

Eyámikekwa shamanism and community rituals

4. Except for emánokwana rituals where the emánokwana drink plantain beer.

5. "...el ***eyámikekwa*** ... no toma nada ... cura solamente mediante la madre del monte, el ***edósikiana***").

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Aside from curing illness due to attacks from the ***edósikiana***, the ***eyámikekwa*** is also responsible for mobilizing the community and effecting a number of community rituals. It is through these rituals that the social ties with the ***eshawa***, notably the souls of the ancestors, animals, and, ultimately, the ***edósikiana***, are re-affirmed. In this way, the ***eyámikekwa*** is seen as mediator whose actions prevent the onslaught of illnesses and guarantees the continued return of the white-lipped peccaries and other game (cf. Reichel-Dolmatoff, 1971). As noted by Burr (1997), "..the ***edósikiana*** are 'eater' spirits, especially eaters of humans, so the intention of the ***eshasha-poi*** is to offset that hunger by feeding ***edósikiana*** with plenty of fermented...banana drink, which causes ***edósikiana*** to get drunk and merry. the general state of happiness created by song and dance during ***eshasha-poi*** is effective is changing the malevolent intentions of the ***edósikiana***..." (ibid: 220).

There are three types of ***eyámikekwa***-based communal rituals, all of which share a basic structure and content, and vary only in the degree of ritual and community participation. In the ***emanokwana*** ritual, all community members begin to assemble outside of the ***eyámikekwa***'s house, shortly after sundown. Families sit on palm mats, in a spatial arrangement that remains constant between rituals. At a certain point, the ***eyámikekwa*** appears through the doorway, donned in the traditional Ese Eja clothing, a knee-length cotton-weaved ***daki nei*** or long vest, dyed in anatto, ***apo'e*** (*Bixa orellana*). He will frequently have annatto-painted bands around his upper arms and wrists, as well as short

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facial stripes or dots. With this and his feather crown (***bo'ba***), the ***eyámikekwa*** adopts the appearance of the ancestors, which is also that of the ***eshawa*** and the ***edósikiana***.

The ***eyámikekwa*** then leaves the community along the trail next to his house and disappears for some time. During this time, he is believed to go to ***meshí-doj"o***, "the core of the earth", to then ascend to the sky. This journey is simultaneously accompanied by the arrival, in turns, of a number of ***eshawa***, representing different ancestors or animal spirits. After about 10 minutes following his departure, the ***eyámikekwa*** returns as an ***eshawa***, his voice, gait and posture changed. To the Ese Eja, the visiting ***eshawa*** are entirely different beings to the ***eyámikekwa***.

As the first ***eshawa*** approaches the village his[6] shrill call can be heard from a distance. One of the Ese Eja, usually an older men, but often a group of men and women simultaneously, call back, beckoning him to come closer. The ***eshawa*** approaches, and remains in the village for a period of time ranging from a couple of minutes to 10-15 minutes.

The arrival of each ***eshawa*** is met by the same kinds of questions and verbal exchanges, as the ***eshawa*** identify themselves and locate any possible family

6. The ***eyámikekwa*** currently living in Sonene, is said to only "know" how to summon male ***eshawa***. Other past ***eyámikekwa***, notably Wohahé, was reputed to summons male as well as female ***eshawa***.

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among their group. Many of the ***eshawa*** are known from previous ceremonies, so that conversations or themes may follow from previous encounters. News may be exchanged, and the ***eshawa*** may be asked about the location of white peccary herds, or the status of recently deceased kin on their way to ***kweyhana***. The ***eshawa*** may warn the Ese Eja of incoming illnesses and cure any sick community members, using the same techniques as the ***eyámikekwa***: indeed, all ***eshawa*** are ***eyámikekwa***, or rather, the ***eyámikekwa*** have the power of ***eshawa***.

There is a considerable amount of humor involved in these interludes, and much pleasant teasing between the ***eshawa*** and the Ese Eja. This contrasts markedly with "normal" Ese Eja attitudes toward the ***eshawa***, who are greatly feared for their "fierceness" and power to cause sickness and sudden death.

Incidentally, these gatherings provide an important context for the expression of community conflicts and for social control, as the ***eshawa*** admonish those who are stingy, lazy or careless about proscribing to dietary regulations. The ***eshawa*** ultimately act as messengers of the ***edósikiana***, suggesting perhaps the need to organize a more elaborate ritual, such as ***eshasha-powi***, so that the ***edósikiana*** can drink plantain beer "and be happy" (***kia biwi***). The departure of an ***eshawa*** is followed by the arrival of a different one, and the process repeated up to about ten times. After the last ***eshawa*** has departed, the ***eyámikekwa*** returns from his "journey" visibly tired, and curious to know from the Ese Eja who the visitors were

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and what news they brought. The ***eyámikekwa*** himself may bring "news" from his trip to the different layers of the cosmos, including the status of peccary herds, or the danger of impending illness and epidemics.

Epowi sese is similar to ***emanokwana***, except that fermented plantain beer is offered to the visiting ***eshawa***. This beer is made by boiling ripe plantains and leaving the decoction to ferment for a few days. The ***eshawa*** may get drunk at such times, causing a great deal of merriment as they stumble about, singing.

The ***eshasha-poi***[7] is the most elaborate of rituals, requiring a greater degree of preparation. An entire raceme of plantains, of the variety ***topa'ai***,[8] is left to ripen over several days, until the fruits become mushy. These are then peeled and grated in the morning, over temporary containers made with the spathes of ***Socratea exhorriza***, ***shakaka***. By late afternoon, the plantain mush is already fermented and is covered in a foamy froth. In the early afternoon, one of the older men in the community, the ***esajiji***, sits in a corner of the community facing the forest and begins to call in a loud chanting voice to different animals, beckoning them to come and drink ***epowi***, plantain beer.

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7. See Burr (1997) for a detailed account of the symbolism and mythopoeic importance of ***eshasha-poi***.

8. This is the same variety that figures in the creation myths, when Ese Eja descend along a cotton ropes after they hear the rotting plantains wail.

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During that whole day there is considerable anticipation in the community, as different youngsters take turns grating the plantain mush, as the ***eyámikekwa***'s wife lays out the ***daki***, re-dying it with anatto, and as the ***eyámikekwa*** makes the last arrangements to his feather crown, ***bo'ba***.

As sundown approaches, community members begin to arrive, and assemble a similar way as in the other rituals, except that the men form a standing unclosed circle on one side. Tied to each other with strips of some bark, such as *Ochroma lagopus*, they start going around in circles singing the song of ***wayo'***, the swift (*Cypseloides* sp.?, Apodidae). During this time, the ***esajiji***, continues to call all the animals, one by one to come to the ***eshasha-poi***. Soon after dark, the ***ɜyámikekwa***, donned in his usual apparel, leaves.

By this time the ***esajiji*** has ceased to call. The circle of men, always holding to each other, never cease to trot in a circle during the whole evening as ***eshawa***, one by one, arrive to exchange news, sing and cure. The ceremony ends when, following the departure of the last ***eshawa*** and the return of they ***eyámikekwa***, the group of men in the circle gather around the spathes full of ***epowi***, humming like bees. The plantain mush is then drunk by all the Ese Eja, among much merriment and commotion.

All these communal ***eyámikekwa*** rituals, and ***eshasha-poi*** in particular, have clear mythological referents. During the ***eyámikekwa*** rituals, the primordial

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undifferentiated state of the universe is temporarily re-created, as all animals return their original forms as Ese Eja. Even the ***edósikiana***, by definition solitary and withdrawn from the world of Ese Eja and human society, may enter the social space of the village to drink plantain beer. Through the momentary return to mythical time, the Ese Eja can safely re-establish social relations with ***eshawa***, their dead kin and, more importantly, with the ***edósikiana***, who control both game and diseases. The inevitable ambivalence and danger of interacting with the ***edósikiana*** is also made evident during the ritual. During the ***eshasha-poi***, the ***eshawa*** may "chase" after the men grunting "uh, uh, uh", an action which is interpreted as the attempt to eat the Ese Eja. In turn, the men, run faster, wailing "*eeeeeeeeeh*".

Through these "***eshawa***" rituals then, Sonene Ese Eja attempt to control the outcome of significant events by emphasizing and effecting vital relationships with the surrounding natural universe, through the reciprocal exchange of goods and services. As an elder once remarked to me, "the ancestors would always have ***eshasha-poi***, that is why the children were fat [healthy]". In effect, the ***epeeji*** relationship based on mutual reciprocity and exchange that characterizes the ***eyámikekwa-edósikiana*** dyad, is extended through these rituals to include the societies that each represents: Ese Eja and ***eshawa***.

By definition, these communal rituals depend on the intervention of the ***eyámikekwa***. Because the last Ese Eja community to have an ***eyámikekwa*** is

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Sonene, Sonene is also the only community to host these rituals. Even in Sonene, the rituals are likely to cease soon, given the ***eyámikekwa***'s old age and deteriorating health. The Sonene Ese Eja already lament the day soon to come, when they can no longer communicate with their dead kin. In other communities, past ***eyámikekwa***, and their unique ability to "bring the dead" is remembered with a mixture of awe and melancholy.

The decline of eyámikekwa shamanism

The Ese Eja repeatedly state that until recently the Ese Eja were entirely dependent on the eyámikekwa to cure illnesses. Even a cursory look into Ese Eja mythology, cosmology and ethnomedicine reveals the central location and importance of ***eyámikekwa*** shamanism as a cultural and social institution. The social importance of ***eyámikekwa*** may at one time have been paralleled by that of ***etii***, the now defunct category of "chief" who reportedly held considerable power and influence over extended family groups in productive activities and military raids.

According to the Ese Eja, individuals do not choose to be ***eyámikekwa***, rather, the ***edósikiana*** chooses the ***eyámikekwa*** by shooting him with his arrow, effectively "killing" him as an Ese Eja and "making" him into an ***eyámikekwa***. When a person is "shot" by the ***edósikiana***, as several men claim to have been

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in the past, they can choose whether they wish to become an ***eyámikekwa*** or not. If they do not wish to become ***eyámikekwa*** , they are healed by an existing ***eyámikekwa*** . Ultimately then, individuals do "decide" to become ***eyámikekwa*** if they are so "chosen".

According to oral accounts and reconstructed genealogical histories, it seems that many extended family groups had an ***eyámikekwa***, and we have reports of up to one in every three adult men being ***eyámikekwa*** (cf. Colchester, 1988, for the Yanomama). The situation began to change around the 1930's, when many of the ***eyámikekwa*** died of epidemics. Fewer and fewer new ***eyámikekwa*** were recruited over the next decades. ***Mejeyo*** and ***Eno Biki*** , the last ***eyámikekwa*** in Beni, together with ***Ñape***, the last ***eyámikekwa*** of Tambopata, all died in the 1970's. The last eyámikekwa in Palma Real, ***Wojajé***, died in 1982. In a mere 50 years, the institution of ***eyámikekwa*** shamanism has declined to its virtual extinction[9]. The decline in eyámikekwa shamanism has been accompanied by the concomitant emergence of ayahuasca in healing and shamanistic rituals.

Ayahuasca shamanism

Ayahuasca, a hallucinogenic beverage prepared by prolonged boiling of the bark of ***jono*** ("ayahuasca", *Banisteriopsis caapi*) with one of several botanical admixtures (McKenna et al., 1995). In Madre de Dios, it is usually prepared with

9. The situation is not unique however. Kensinger for example, reports a similar process among the Cashinahua following massive depopulation.

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the leaves of *Psychotria viridis* R. & P. (Rubiaceae).[10] The beta-carbolenes in *Banisteriopsis* act as monoamine oxidase inhibitors, which render the tryptamines found in *Psychotria* active (Schultes and Hoffman, 1980). Thus, although the visionary experience of ayahuasca is generally attributed to *Banisteriopsis*, it appears that hallucinations are induced by the tryptamines (DMT) in the admixtures (McKenna et al., 1995)

Ayahuasca is without a question the most widely employed hallucinogen in western Amazonia, its use being recorded throughout much of the Colombian, Ecuadorian, Peruvian and Bolivian Amazon, extending into parts of the Brazilian Amazon as well. Its use is not only prevalent among many lowland indigenous language families, including not only Tukanoans *sensu lato* (Dolmatoff, 1971; Langdon, 1992; Vickers and Plowman, 1984); Shiyipan (Juncosa, 1988); Arawaks (Andritzky, 1989; Baer, 1992; Weiss, 1973), Quichuan (Oberem, 1958; Whitten, 1976), Shuaran (Bennett, 1992; Harner, 1984), Caribs (Chaumeil, 1983), Panoans (Cárdenas, 1989; Carneiro, 1964; Kennsinger, 1973 ; Siskind, 1973), but also among Andean Quechua (Ramírez de Jara and Pinzón, 1992), caboclo and Ribereño populations, both in rural and urban areas (Dobkin de Rios, 1973, 1984:173ff ; Luna, 1986), where it has also become part of a messianic religion (Fróes, 1983). Moreover, in the past decades, its use has expanded not only to other regions of South America, including the Andes and

10. *P.carthagenensis* Jacq. and the scandent liana *Diplopterys cabrerana* (Cuatrec.) B. Gates, are also reported as admixtures in other areas of Amazonia by Schultes and Hoffman (1980).

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cities of the Pacific coast, but also throughout the world as part of the new-age cultural movement (Dobkin de Rios, 1994; Joralemon, 1990; Ott, 1995). Ritual uses of ayahuasca include divination, diagnosis and healing, most frequently in the context of shamanism, where ritual specialists prepare, and drink the beverage in a ceremony involving initiates, participants and patients (Luna, 1986).

Despite its prevalence and central role in much of Amazonian religion and cosmology, ayahuasca is a recent cultural incorporation among several indigenous groups, at least in Madre de Dios and Beni. There is considerable evidence that the Ese Eja first experimented with ayahuasca earlier this century, as did the neighboring Arakmbut[11] (Gray, 1997;74) and Tacanan Cavineño (Alfredo Tavo, pers. comm., 1994). Even among certain Panoan groups, generally reputed and well known for their elaborate ayahuasca-based shamanistic systems, the use of ayahuasca seems to be fairly recent. For example, the Yora (Nahua), a group inhabiting parts of the Urubamba and Manu drainage systems, started using ayahuasca following their contact with other Panoans and missionaries in the late 1980's (Shepard, in prep.). It is possible that ayahuasca use among other indigenous groups in the Amazon is also more recent than has been previously thought. Indeed, Gow (1994: 91) has suggested that ayahuasca is "absent precisely from those few indigenous peoples who were

11. The Wachipaeri and Zapiteri utilize *Brugmansia* as a hallucinogen (Califano and Fernandez, 1982). Ayahuasca usage is very low among this group, as among the neighboring Amarakaeri (Arakmbut).

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buffered from the processes of colonial transformation caused by the spread of the rubber industry in the region."

Ayahuasca and the Ese Eja.

As with the Harakmbut and Yora, ayahuasca appears to have entered the Ese Eja ethnobotanical universe following the first prolonged and direct contacts with other non-Ese Eja, subsumed under the Ese Eja by the category of ***deja***. In the case of the Sonene Ese Eja, the first experiences with ayahuasca date to the 1940's and 50's, when several families were living in a "barraca" in the upper Madidi. I have already suggested that "barracas", hacienda-style holdings where the Ese Eja engaged in a number of extractive and agricultural activities in exchange for manufactured goods, catalyzed the incorporation of a broad range of ethnobotanical and ethnomedical knowledge. The lack of a specific cognate for the plant also suggests its recent introduction in the Ese Eja ethnobotanical universe: the Ese Eja name for ayahuasca is, ***jono*** a generic term for "vine".

Irrespective of how or when the Ese Eja came into contact with ayahuasca however, the Ese Eja are unequivocal in associating the plant with ***deja*** society and knowledge. That is, although *Banisteriopsis* grows throughout much of the Ese Eja inhabited space, the status of the plant as a medicinal, is closely associated to ***deja*** knowledge: that is, ***jono*** is ***dejaha*** (see chapter 8).

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Ayahuasca is drunk or has been drunk at some point in the past in all Ese Eja communities, though the degree and contexts in which it is used vary considerably. Of all communities, Infierno, has most intense interactions with ayahuasca: there are several groups of "ayahuasqueros", both Ese Eja and Ribereño, some of which treat patients in the community and beyond.

The relationship between Infierno Ese Eja and ayahuasca was intensified in the mid 1980's, when a primary health care project, AMETRA 2001, facilitated a number of ethnobotanical exchanges between different ethnic groups. The extended visits of several Shipibo-Conibo "ayahuasqueros" in Infierno, led to a marked increase in the use of the ritual drug in shamanistic contexts in the community. A considerable number of patients were treated by these "ayahuasqueros", and several Ese Eja took up or continued their apprenticeship with them (Alexiades and Lacaze, 1995). Today, there are several Ese Eja "ayahuasqueros" in Infierno who are recognized as healers and whose knowledge and power incorporate Ese Eja elements of the cosmology and healing, with Shipibo-Conibo ayahuasca shamanism and ethnomedicine[12].

In Palma Real and Sonene, ayahuasca is drunk by a small group of people, the composition of which varies somewhat over the years. In these communities, ayahuasca is drunk on a monthly basis, every new moon, and in a context that differs in several important ways from that of Infierno, notably the absence of a

12. One Ese Eja ayahuasquero for example, once explained to me how ayahuasca is formed from dead ***edósikiana***, thus drawing an interesting parallel with ***eyámikekwa*** shamanism.

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strong Shipibo-Conibo influence. Unlike in Infierno, Sonene ayahuasqueros are not specialist healers who undergo a process of initiation and apprenticeship with more experienced healers, but individuals who participate in a group ritual, seeking "to see" and prevent the onset of illnesses[13].

Though several Ese Eja in Portachuelo claim to have experimented with ayahuasca on a regular basis in the past, and in ways which resemble how it is drunk in Sonene, the practice seems to have been recently abandoned. The presence of evangelical missionaries in that community over the last 30 years may have played an important role to this effect. Certainly, Portachuelo Ese Eja are much more cautious about discussing ayahuasca than other Ese Eja. For the sake of simplicity, I will restrict my discussion largely to the data and observations of ayahuasca use in Sonene, though I will make some specific references to ayahuasca shamanism in Infierno to highlight some points.

The ayahuasca ceremony

One of three men who regularly drink ayahuasca in the community, will leave early in the morning to one of the various sites in the forest where the vine is known to grow. Once he arrives at the site, he circles the plant a few times,

13. The differences in ayahuasca rituals between the Shipibo-Conibo and the Ese Eja coincide with Gow's (1994) estimation that indigenous which have recently incorporated ayahuasca, use it in ways which are distinct from those who incorporated ayahuasca in an earlier colonial context.

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invoking it, sometimes silently, sometimes aloud, to *"help us see fever, vomiting [and other illnesses]."* A section of the vine about three meters long is cut, and this in turn is cut into smaller sections, each about 50 cm. long. Before leaving, the cut base of the vine is covered with leaves and dirt since, as *"this is its eye...this way it cannot see [my] child [so that it]... does not give [my child]....fever"*. The leaves from about nine separate shrubs of *Psychotria viridis* are also collected, and, again, as the leaves are picked the collector asks the plant aloud, in Ese Eja, to help the drinkers see and keep away different illnesses.

Back in the village, in a somewhat removed site, the leaves are boiled in a large pot on an open fire on the ground, and the pounded vine sections added on top. These are then covered and left to boil for about 90 minutes, after which the stems are removed and new ones added. When only two inches of the decoction remain in the pot, the leaves and stem sections are removed and thrown away. The remaining decoction is boiled until only about an inch of decoction remains. This is then left to cool and drunk that evening. A fast is kept during the day of the ceremony and for a few days after, avoiding certain foods and sexual relations

At about 9 pm, when most people in the village have retired for the night, the people who are to drink meet in a secluded spot. When I was in Sonene, this was an abandoned house close to the village. The pot with the ayahuasca

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preparation is placed in the middle of the floor and participants sit forming a circle around it. Each person rolls one or more cigars and smoke is blown over the preparation. After a short while, each person scoops a small amount of the beverage into a cup, drinking and passing the cup to the next person. After all have drunk, all lights are extinguished until the end of the ceremony, six to eight hours later. Singing begins anytime between 15-30 minutes after drinking, when participants start to feel "drunk" ("borracho"). Usually, one person begins to sing alone, and is gradually joined by the others. Rather than singing in unison however, each singer is singing a different part of the song, but because the songs have a very simple rhythm, the rhythms, if not the lyrics, overlap[14].

The Ese Eja claim that the reason they sing is so that the ***eshawa***, who often arrive in the shape of airplanes or boats, do not take them away. "Being taken away" is also a reference to becoming crazed or ***ñiñe***, "alocado". Singing continues almost non-stop until the effects begin to subside, anywhere between two to three hours after having drunk the ayahuasca. At this point, the participants drink a second round, extending the ceremony until two or three in the morning, sometimes later. Next day, hoarse, the participants will share with their family members their visionary experience.

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14. The form and content of these Sonene ayahuasca session differ markedly from those among Ribereños, Shipibo, and Infiemo Ese Eja, where there is a specialist curer who in effect leads the ceremony, from which initiates learn, and to which patients are brought, often from far away. In contrast, the Ese Eja ceremony is not as formally structured, and participants act more individualistically. Likewise, there is no initiation or complex rituals regarding curing of patients. In fact, there are no patients, though this does not mean that the Sonene Ese Eja do not regard the ceremony as a vehicle to effect cures, as I discuss below.

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When discussing the motivation to drink ayahuasca, many Ese Eja will refer to the act of "seeing" ("para ver"). Likewise, most of the discussions surrounding the experience and significance of ayahuasca ceremonies revolves around the visions, often shared by all participants. In addition, the Ese Eja claim that ayahuasca is an effective means to prevent, diagnose and treat illness. I believe these two processes are inextricably related.

The Ese Eja verb 'to see', [***eba***'], is the same as 'to know', and the negative of 'not see' or 'not know' (as in "I don't know") is always articulated in the conditional form. In Ese Eja, "I don't know" (***ekweya bajima***) means "I have not seen/ I do not know *yet*". Thus, for the Ese Eja, that which is unknown and unseen is potentially knowable and visible, and it is precisely at this juncture, I suggest, that ayahuasca is viewed and valued. The reference to "seeing" in connection to ayahuasca is metaphorical as well as literal. The visions induced by ayahuasca, often compared by people "to the cinema", are valued and seen as profoundly revealing. Through its visionary experience, ayahuasca allows critical and direct access into ordinarily invisible events and processes; events and processes which the Ese Eja strive to control through the closely interrelated realms of knowledge and action, vision and power.[15]

The other commonly stated reasons for drinking ayahuasca, preventing illness and ensuring vigor and health, are thus logical corollaries to the visionary

15. The close relationship between vision, knowledge and power in the context of ayahuasca shamanism is discussed in great detail by Chaumeil (1983).

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experience. In addition, it is also possible that the ayahuasca itself, and the drinker by association, emanates power and hence protection from the attacks of illness and sorcery.

There appears to be a pattern in the types of visions seen during ayahuasca ceremonies. Often, the same vision is shared by several or all participants. Common visions include animals, particularly snakes and aquatic animals, as well as man-made objects including airplanes, boats and cars. Indeed, it is notable how frequently ayahuasca visions use "outside" objects as primary sources of reference. One individual for example described a vision of a concrete house, which included an ornate lock and key. When asked about the meaning of this vision, my friend explained that it was the house of ***mawi*** (*Dipteryx alta* Vogel), a tree which figures prominently in Amazonian folklore as well as in Ese Eja ayahuasca imagery.

Frequently, the souls of different plant and animal spirits appear in the form of boats, cars and airplanes. Often the identity of a particular spirit is attached to that of a specific object. The soul of the Brazil nut for example, is reported to arrive in the form of a large boat with a big chimney [16].

16. One may wonder if the image may relate in fact to the "chatas", the large boats which seasonally travel upriver, loaded with manufactured goods to be traded in exchange for Brazil nuts. Incidentally, brazil nuts are one of the most important plant resources associated with sedentization of the Ese Eja and their incorporation into the market economy, both in Peru and Bolivia; that is, they are clearly associated with ***deja***.

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Healing is another important aspect of ayahuasca sessions. In contrast with ***eyámikekwa*** curing, and ayahuasca curing among other groups, ayahuasca curing is effected through visions with no direct manipulation or physical contact between the patient and healer. In fact, "the patients" are often not even present in the ceremony. In one instance for example, the recovery of a two-year old from an acute bout of diarrhea was attributed to the actions of several participants during an ayahuasca session. That evening, the participants "saw" him already walking along ***kweyhana***, the road of the dead, at which point they summoned him back to the world of the living, thus saving him. The vision of the child's **eshawa** walking along **kweyhana** resonates with Ese Eja experience of illness as a sojourn into the "space" of death (***emano***). Likewise, summoning back the ***eshawa*** to the world of the living is a powerful image of healing and re-incorporation into the world of the living.

Participants also ask the ayahuasca, both at the onset of the ceremony and through their chants, to keep away, literally to shoo away ("espantar"), illnesses, including fever diarrhea, coughing and measles. As I noted earlier, these illnesses are perceived as ***eshawa***, who living "in the headwaters", periodically raid Ese Eja villages in order to predate on humans. As I discuss in chapter 9, medicinal resources, through their bitter quality, have a similar effect: expelling or replacing pathogenic ***eshawa*** which have transgressed the patient's body.

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Ese Eja shamanism and human-environment relations

As we have seen, both ***eyámikekwa*** and ayahuasca shamanism hinge upon the same cosmological precepts: a multilayered cosmos populated by visible and invisible (extrahuman) beings who are internally organized in ways which basically replicate Ese Eja social organization. Though distinct, these "worlds" are not isolated from each other: rather, they are profoundly interconnected. Life, health and abundance of game, and its counterpart, illness, misfortune and death all reflect this broad and inevitable interdependence. The specific outcomes of these interactions do depend on the ability of the Ese Eja to effectively position themselves within this socio-ecological web of life.

Recent changes in the relationship with ***deja***, have somewhat altered the characteristics or flow of exchanges within this cosmological web. Whereas relations between the ancestors, ***etiikiana***, and outsiders, ***deja,*** were in the past (***yawaho nei nei***) mostly characterized by predatory exchanges in the form of war, kidnapping and death, the Ese Eja today maintain a more intense yet ambivalent relationship. On the one hand, there is an dependence and familiarity with ***deja*** culture and, most particularly, with manufactured commodities. The process of sedentism, growing dependence on manufactured goods and adoption of ***deja*** customs- from language to foods and cultural institutior.s such as schooling- mean that Ese Eja today recognize themselves as hybrids between ***etiikiana*** and ***deja***, between "ancestors" and "outsiders" (cf. Gow, 1993). On the other hand, **deja** are still viewed as intrinsically stingy and predatory. Instead of

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killing or kidnapping the Ese Eja however, ***deja*** today predate on the Ese Eja through economic exploitation and devious trickery.

As we have seen, different Ese Eja are positioned somewhere along the continuum of Ese Eja-***deja*** identity, a result of their location within a particular community or river and through the development of individual strategies. The position of the Ese Eja along this socio-cultural continuum is reflected in their geographical position between the headwaters and the mouth of the river, the former being associated with the past and lack of contact-or hostile relations-with ***deja***, and the latter with increased contact and dependence on ***deja***.

Game and manufactured goods, are the two most coveted resources in terms of Ese Eja dependence on their surrounding universe. While game is "controlled" by the ***edósikiana***, manufactured goods are controlled by ***deja***. Just as the ***edósikiana*** and ***deja*** are seen as the sources of game and manufactured goods, they are also the sources of illnesses, manifested as "piercing" from ***eshawa*** and sorcery through plants, respectively. Knowledge, including shamanistic knowledge, is a powerful tool through which individuals seek to maximize their own and their kin's well being, maximizing access to valued resources, and minimizing exposure to illnesses. Whereas ***eyámikekwa*** shamanism is broadly associated with animals and hunting, ayahuasca shamanism is associated with plants and ***deja***[17].

17. Later on, I will suggest that medicinal plants are an important element of deja knowledge.

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The distinction between ***eyámikekwa*** and ayahuasca shamanism is one that is made by the Ese Eja themselves, who clearly identify the first as related to the power of ***edósikiana***, and the former to ***jono***. The language, content and symbols utilized by ***eyámikekwa*** and ayahuasca shamanism are different to the extent that the former excludes and the latter includes references to ***deja***. We have already seen for example, that the ***edósikiana***, the animal ***eshawa***, the ancestors and the ***eyámikekwa*** all wear the same attire. Indeed they are all referents of ***yawaho nei nei***, "long ago", in which historical time and mythical time collapse (myths *are* history for the Ese Eja). During ***eyámikekwa*** rituals, visiting ***eshawa*** display fear and ignorance toward everything that relates to ***deja***: Spanish language, a cat's meaow or the taste of salt, all produce dramatic signs of terror and displeasure among the ***eshawa***. Indeed, none of the ***eyámikekwa*** community rituals can be conducted, according to the Ese Eja, with any ***deja*** present, unless these live in the community and in a sense already assimilated. These ***eshawa*** thus represent the Ese Eja before contact with ***deja***, when they were wild.

Not only is the attributed origin and actual praxis of ***eyámikekwa*** devoid of overt ***deja*** content, but the language used also does not include references to ***deja***. In a sense then, the ***eshawa***/ancestors/***edósikiana***/***eyámikekwa*** all represent an element of Ese Eja identity that relates to the past (the ancestors), which in effect rejects the incorporation and assimilation by ***deja***, a historical process which

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continues to be part of Ese Eja experience today. Indeed, living with the Ese Eja, one is constantly witnessing the conflicts arising from the simultaneous desire for the objects and knowledge of ***deja***, and the deep mistrust and dislike for ***deja*** people and values. Even in Infierno, where Ese Eja and ***deja*** co-exist and have intermarried, there are deep schisms between them, which are reflected at almost all levels of community life.

In contrast to ***eyámikekwa*** shamanism, ayahuasca shamanism is permeated, even defined, by ***deja*** images and language. Not only is the plant itself perceived as ***dejaha***, but also the imagery associated with the hallucinations it induces is full of referents to modern technology and manufactured goods, including airplanes, boats, machines, steel and concrete houses. The language of ayahuasca is also ***dejaha***, as the songs are spoken in Spanish but with Ese Eja pronunciation. Thus, to the Ese Eja, ***jono*** provides access to the world of ***deja***, symbolized by a technology that the Ese Eja frequently only see from a distance. Through the use of ***jono***, the Ese Eja express their intermediary position in the ***etiikiana-deja*** continuum of socio-cultural, ecological and ethnobotanical existence.

Another notable difference between ***eyámikekwa*** and ayahuasca shamanism is the differential use of animal and plant imagery. ***Eyámikekwa*** social rituals for example, almost exclusively involve the ***eshawa*** of ancestors and animals, whereas ayahuasca healing rituals draw extensively upon the imagery and

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presence of plant ***eshawa***, particularly those of trees. I believe that the relationship between ***jono*** and trees is not coincidental, and that both are, for the Ese Eja signifiers of ***deja*** knowledge and power. As I discuss in chapters 5 and 8, much of the knowledge of the plant world, particularly of non-cultivated plants, is associated by the Ese Eja with ***deja*** knowledge.

We have already seen how the process of sedentization for the Ese Eja has entailed a shift away from a subsistence strategy largely based on hunting, to one heavily based on interacting with plants. Rubber, brazil nuts, rice agriculture and timber may serve as symbols of contact between the Ese Eja and ***deja***. Knowledge of the power of trees, including sorcery or "daño de gente"[18], is attributed and associated with ***deja***, and is effected through lowland trees, referents of ***deja***. Thus, I suggest that wild animals-notably white-lipped peccaries, ancestors and the ***edósikiana*** are all semantically related and distinct from trees, ***deja*** and ayahuasca. Figure 7.1 summarizes the proposed dichotomy between ***eyámikekwa*** and ayahuasca shamanism, in terms of its various cultural, ethnobotanical and geographical referents.

In this sense, the imminent extinction of ***eyámikekwa*** shamanism and the concomitant emergence of ayahuasca shamanism, reflect a major shift in how the Ese Eja perceive their relations with their surrounding environment, notably game and plant resources. Strengthening the bonds and relationship with ***deja***

18. The Spanish term "gente" (people) is the equivalent for the Ese Eja term ***deja***.

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has implied the concomitant weakening of relationships with the ***etiikiana***, and by extension with the ***edósikiana***. Indeed, this shift is epitomized by the "unwillingness" of the Ese Eja to learn to become ***eyámikekwa***.

A key aspect of ayahuasca shamanism is perhaps not so much that it includes ***deja*** elements, but that it combines Ese Eja and ***deja*** elements: that is, it expresses and mobilizes contemporary notions of Ese Eja identity which include critical, though necessarily fragile and ambivalent notions and relations with both ***eshawa*** and ***deja***.

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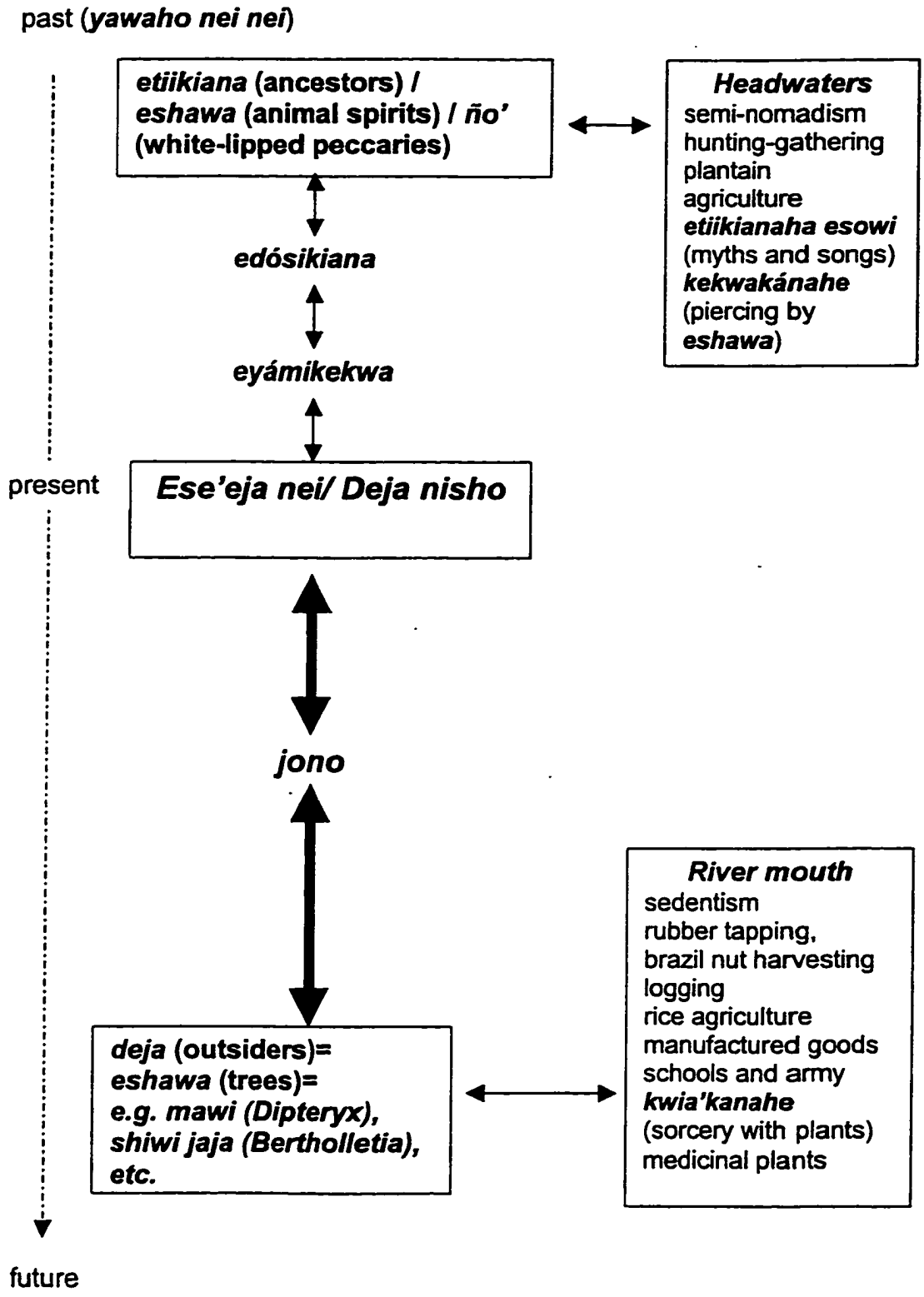
Figure 7.1. *Eyámikekwa and ayahuasca shamanism and its cultural, ethnobotanical and geographical referrents.*



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Chapter 8.

The Nature and Scope of Medicinal Resources

Introduction

During the course of their lives, most Ese Eja utilize a number of substances in a wide range of contexts relating to health and well being[1]. By ingesting, inhaling, touching, rubbing, or bathing in these, the Ese Eja attempt to avert and cure illness, promote certain physical and character traits in their offspring, and manipulate the nature and outcomes of social, sexual and ecological relations. Referred to by the Ese Eja as ***eshikwiji***, ***shemeyo***, or, in Spanish "remedio", these substances are associated with many critical stages and processes in an individual's life, making them frequently utilized and highly valued resources.

In this chapter, I begin to address a basic question: what are Ese Eja medicinals? As Alcorn (1982) points out, the label "resource" is not only the product of the physical, biological or chemical properties of the organism in question, but also reflects the specific "needs" of the individual or society, needs which in turn are shaped by a host of physical, biological, social and politico-economic factors (ibid:295). Technological capacity also helps determine the status of resources. Because human needs, perceptions and access to technology, are highly

1. Several researchers (e.g. Etkin, 1994; Etkin and Ross, 1983; Heinrich, 1998; Johns, 1996) have highlighted the overlap between nutrition and medicine in that dietary products frequently directly and indirectly affect the body's relations with the surrounding population of parasites and

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variable and dynamic processes, it follows that the role and characteristics of resources also changes considerably in space and over time (e.g. Balée, 1994).

Geonoma, for example, is an important thatch material today among the Ese Eja in Sonene, Infierno and Palma Real. Oral accounts suggest that this role is recent, as historically the Ese Eja used a range of other palm species for thatch, mostly *Attalea spp.* While *Geonoma* thatch is more durable, it is also quite labor intensive to make, as it requires the weaving thousands of small individual leaves between two *Gynerium* stem slats. In contrast, the leaves of *Attalea* are not as durable, but their size and architecture precludes the need of time-consuming weaving that characterizes *Geonoma* thatch. One possibility is that the recent role of Geonoma as a thatch may thus be related to increased sedentism, and a consequent shift in the cost-benefit ratio of *Geonoma* use. In chapter 11, I explore the possibility that the changing role of plant medicinals in Ese Eja ethnomedicine may be related to health changes following contact with the nation state and the adoption of a more sedentary lifestyle.

The fact that the resource status is subject to spatial and temporal variability raises the question of how such labels are conferred, removed, or altered. Such examinations can focus on either of the two aforementioned components of the "resource": the properties of the resource, or the needs or characteristics of the society in question. While biologists, chemists, ecologists, foresters and

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pathogens. In this chapter I focus on the intentional use of substances in non-dietary contexts, even if some of these substances are also ingested separately as part of diet.

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pharmacologists have tended to focus on the physical, nutritional, chemical or ecological characteristics of plant resources, social scientists have focussed on the cognitive, economic and socio-political dynamics whereby resources are identified and utilized. In this chapter I address, albeit partially, both these aspects, in an attempt to draw a preliminary representation of Ese Eja medicinal resources. Specifically, I will address the following questions:

- what range of contexts or applications are included by the Ese Eja under the category of ***shemeyo***?
- what are characteristics of Ese Eja medical resources? what organisms are used? how are they used?
- how and why are certain medicinals thought to be effective by the Ese Eja? how do these and other criteria inform the selection and use of specific treatments?
- how does Ese Eja medicinal resource utilization differ from other health-related behaviors, notably shamanism and biomedicine? what is the relationship between these three cultural systems within Ese Eja society?
- what are the sources of Ese Eja medicinal knowledge; how is it exchanged and how does it change over time?

The scope of medicinal resource utilization

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The Ese Eja use medicinals for a broad range of contexts relating to individual well-being. Examples include:

- drinking a decoction of the leaves of *Citrus aurantifolia* (Christm.) Swingle, in order to overcome sadness and melancholy (***kia eno***);
- drinking an infusion made with several crushed and roasted ***pickeki*** (unidentified Hymenopteran) to assist in finding a new spouse;
- inserting crushed leaves of *Siparuna bifida* (Poepp. & Endl.) A.DC into the nostrils and anus of hunting dogs, to train them not to defecate around the house, be alert, improve their sense of smell, and give them the courage to pursue large and dangerous prey.
- bathing in the leaves of *Senna reticulata* (Willd.) I. & B., to help restless, crying babies sleep well.
- Bathing small children in solutions of *Ocimum micranthum* Willd., or *Erythrina dominguezii* Hassl., to protect them against illness.
- Drinking the decoction of the bark of *Triplaris americana* L., to treat ***see-see***, diarrhea.
-

These examples illustrate the role of medicinals as substances through which individuals manipulate their surrounding social and natural environment. The use of medicinals is inextricably related to the perception that some substances have the intrinsic potential to effect powerful transformations in organic, physiological, perceptual, social or ecological processes, or to respond to changes.

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Of the multiple contexts in which medicinals are used, the prevention and treatment of illness is the most common and salient. The emotional stress associated with illness is illustrated by the fact that the term for sick, ***emano,*** is the same as the term for dead (cf. Langdon, 1979: 65, for a similar perception among the Siona). When a patient lies in bed sick, children and women will frequently whisper to each other "so-and-so is dying". Indeed, sickness signals entry into the space of death (cf. Burr, 1997: 220), both metaphorically and literally: most illness episodes in rural communities can rapidly deteriorate into life-threatening situations. As a result, most Ese Eja adults will know medicinals to treat a wide range of symptoms and ailments, including ***see-see*** (diarrhea), ***tee-nee*** (stomach/gut ache), ***bowii*** (vomiting), ***oho*** (coughs), ***sapa nee*** (head ache), ***kiyo*** (fever), ***se' nee*** (tooth ache), ***shaja nee*** (ear ache), among many others.

Characteristics of Medicinals

Types of medicinals

Ese Eja medicinals (***shemeyo***, ***eshikwiji***) include a wide range of plant and animal products, as well as some mineral and manufactured substances. In the last years the Ese Eja have had greater access to pharmaceutical preparations,

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"remedios de botica". Plant medicinals are generically known as "remedios del monte", "remedios vegetales", or ***akwí shemeyo*** ("tree/shrub-medicinal").

For the Ese Eja, all ***shemeyo***, be they plants or manufactured substances, are comparable insofar as how their efficacy is construed (see also Brett, 1994). The action of pharmaceutical and biomedical treatments is perceived according to Ese Eja categories: that is, in ways that are comprehensible and hence potentially controllable (cf. Ales and Chiappino, 1985:84). While some pharmaceuticals, such as generic aspirin and antibiotics, are generally regarded as safe and utilized whenever available, other treatments and forms of administration, such as intravenous drips and injections, are often considered very "strong" and hence too dangerous for young children or weak patients.

Plant products

Since I began conducting ethnobotanical research in 1985, I have documented a total of 210 species of plants labeled as medicinals by the Ese Eja[2]. Appendix 1lists 141 of these[3]. This inventory, which includes a total of 70 flowering plant families, and 155 genera, is quite sizeable, and compared to others in Amazonia

2. See chapter 2 for a discussion of the methodologies employed in collecting data.

3. 49 species were not included in order to protect Ese Eja intellectual property rights, as described in Chapter 2. The other 20 species consist of unconfirmed reports and/or species not actually observed, and hence excluded from the analysis.

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(e.g. Boom, 1987 for the Chácobo; Lowell, 1994 for the Shuar; Pinkley, 1973 for the Kofán; Plotkin, 1986 for the Tirio). Even so, it does not represent an exhaustive listing of Ese Eja ethnobotanical knowledge: I estimate there are at least another 100 species labeled as medicinal throughout all Ese Eja communities. I do believe, however, that the sample included in this study represents the most salient and widely shared medicinal resources known and utilized by the Ese Eja, particularly in the context of treatment of illness symptoms.

One important reason for the sizeable number of species included in the Ese Eja repertoire is their scattered distribution over a large area, which encompasses markedly different vegetation zones and contact with numerous social groups. Indeed, the location of the Ese Eja at the transition between montane and lowland tropical forest is characterized by very high biological diversity and a sharp ecological gradient (see chapter 3).

Table 8.1 lists the distribution frequencies of medicinal genera and species, arranged by plant family. Close to 50% of the medicinal plant families are represented by only one species. Based on the number of genera and species utilized, the most ethnobotanically salient families are Rubiaceae, Piperaceae, Araceae, Euphorbiacae, Fabaceae, Moraceae, Bignoniaceae, Cucurbitaceae and Solanaceae.

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Table 8.1: Major Ese Eja medicinal plant families

FAMILY	GENERA	SPECIES
Piperaceae	3	10
Rubiaceae	7	9
Araceae	5	8
Euphorbiaceae	7	8
Fabacee	5	8
Moraceae	6	8
Bignoniaceae	7	7
Cucurbitaceae	5	5
Solanaceae	5	5
Anacardiaceae	4	4
Arecaceae	4	4
Poaceae	4	4
Rutaceae	3	4
Apocynaceae	3	3
Asteraceae	3	3
Burseraceae	2	3
Capparidacee	2	3
Lauraceae	2	3
Loranthaceae	3	3
Malvaceae	3	3
Monimiaceae	2	3
Myristicaceae	3	3
Bombacaceae	2	2
Caesalpiniaceae	2	2
Commelinaceae	2	2
Costaceae	2	2
Flacourtiaceae	2	2
Lamiaceae	2	2
Lecythidaceae	2	2
Malpighiaceae	2	2
Menispermaceae	2	2
Mimosaceae	2	2
Myrtaceae	2	2
Musaceae	2	2
Phytolaccaceae	2	2
Polygonaceae	1	2
Portulacaceae	2	2
Sapindaceae	1	2
Tiliaceae	2	2
Pterydophytae	3	3

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While the first six are ecologically very important, the ethnobotanical salience of Bignoniaceae, Cucurbitaceae and Solanaceae suggests medicinal plant selection is not simply correlated to the relative abundance of different plant groups (cf. Moerman, 1979).

Fig 8.1 shows the relative importance of different plant habits in medicinal applications. Half of all medicinal applications involve the use of herbs and shrubs. Though 36% of the species are trees, frequently it is only saplings which are used, as leafy parts and shoots are close to the ground and hence more accessible.

Figure 8.1. *Habits of Ese Eja medicinal plants*

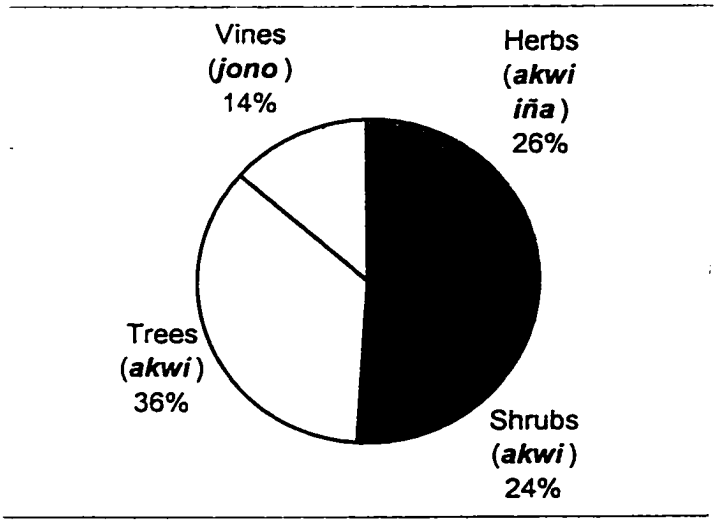

Fig. 8.2 shows the importance of different plant parts as medicinals. Leaves, used in almost half of all treatments, are indeed the most frequently utilized plant

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part (cf. Plotkin, 1986:345 for the Guyanan Tirio) . Frequently, only young leaves are used, particularly for internal treatments. The fact that some secondary compounds, particularly alkaloids, are found in higher concentrations in leaf tips and young tissues (McKay, 1979), suggests a process of chemical selection. Young leaves are also cleaner and generally less likely to be mechanically damaged, covered with lichens, moss or fungi.

The remaining treatments are divided almost equally between stems (including the pith of certain monocotyledons), exudates, barks, roots and root organs, and fruits or flowers. Most treatments recorded (65%) are external. Most of the other 35% are administered orally, mostly orally, though several remedies for coughs and colds and hunting charms are also inhaled. Though most dog hunting charms are applied externally, some are inserted into the dog's nose or anus, in which case absorption may take place through the mucous membranes.

Most external treatments (70%) involve direct contact of the plant tissue over the affected part. Exudates are occasionally soaked in a cloth, which is then applied over the affected area. Leaves, bark or shoots are crushed and wrapped around the affected part with a cloth, particularly in the treatment of traumatic injuries. External application in some cases simply involves rubbing the plant, usually the leaves, over the body. Charms not inhaled or used in baths are applied in this way.

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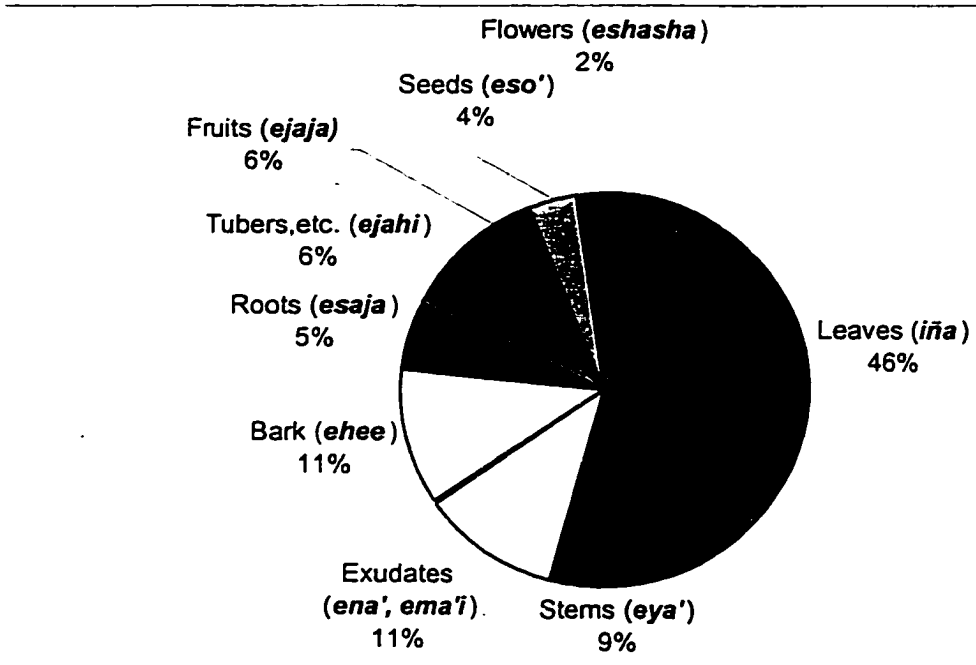
Bathing in plant solutions is also an important administration procedure, particularly in the treatment of fevers, and as panaceas to prevent illness in children. Several elders stated that in the past nearly all Ese Eja medicinal resources were applied in this way. A similar pattern is reported among the Yanomami (Milliken and Albert, 1996) and Central American Maya (Balick, pers. comm., 1998).

Figure 8.2. *Plant parts used by Ese Eja medicinals*



Some treatments are hard to categorize as either internal or external. One application of *Cecropia* leaves for example, involves urinating on the leaf as a treatment for "painful urination", a condition which may include cystitis, urinary

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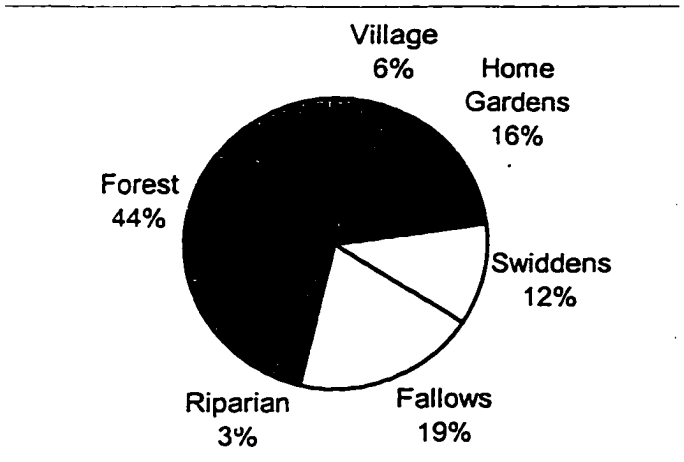
tract infections, venereal disease or kidney stones. The leaves of plants such as *Potomorphe* are placed under restless babies to help them sleep. Though this application might be considered external, the possibility of a pharmacological effect through inhalation of volatile compounds cannot be ruled out.

Appendix 1 also shows the habitats from which medicinals are harvested. The classification of habitats used in this list is based on Ese Eja ethnoecological categories, which, for example, consider fallows older than 15 years to be ***ebio'*** ("forest"). Figure 8.3 summarizes the frequency distribution of Ese Eja medicinal resources with respect to major habitats.

Figure 8.3. *Habitats of Ese Eja medicinal plants*



Village: Species spontaneously occurring around the village area, which are not managed (propagated, protected, etc)

Home Gardens: Species intentionally propagated and protected

Swiddens: Includes cultivated and agrestic species

Fallows: Includes cultivated, semi-cultivated and secondary-growth species in vegetation up to about 15 years old.

Riparian: Edges of rivers, mostly in sandbars and *restingas*

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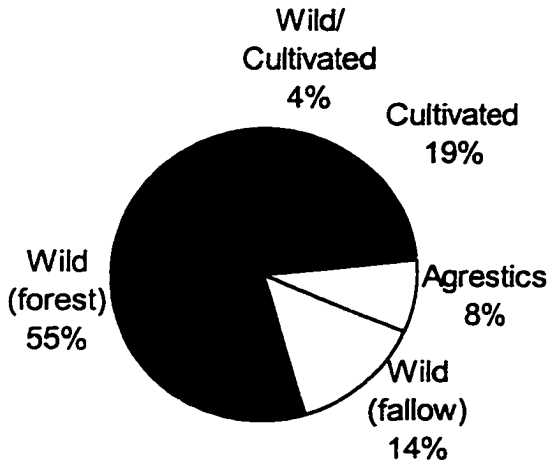
Forest: Secondary vegetation older than ca. 15yrs and mature forest

Although 44% of the inventoried medicinal species occur in mature forests, a significant proportion of these also occur and are more likely to be harvested from fallows. Figure 8.4 provides additional information on the management status of Ese Eja medicinal species.

Fig. 8.4. *Management status of Ese Eja medicinal plants*



About half of all medicinals reported by the Ese Eja grow in intensely managed environments, with 20% actually being cultivated.

The ethnobotanical importance of fallows and home gardens is even greater than is suggested by this data, given that most of the frequently employed medicinals

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are obtained from these areas. That is, many of the plants reported by the Ese Eja to occur in forests are only occasionally used; usually when more accessible alternatives don't exist or appear to be ineffective (see chapter 9). In effect, even though the total inventory of plants suggests a strong dependence on wild or forest resources, in actuality, medicinal resource utilization revolves around the use of readily accessible species, mainly in anthropogenic vegetation zones, and most especially home gardens (cf. Kohn, 1992).

Animal products

The role of animal products in indigenous medicine may be greater than has been generally reported (but see for example, Ramos-Elorduy and Pino, 1988). I gathered information on close to 40 species, and I suspect there are many others. Among the Ese Eja, animal-based medicinals are not used as consistently or frequently as plant alternatives. This, coupled with their lower cognitive salience may lead to them being more frequently omitted from verbal reports[4]. This may be related to the fact that most animal products are difficult to obtain and involve time-consuming preparations. For example, the oils of several reptiles, including the anaconda, ***sa'ona*** (*Eunectes murinus*, Boidae), black caiman, ***shai'jame*** (*Melanosuchus niger*, Alligatoridae), and land tortoise eggs, ***daki 'ai***, (*Geochelone denticulata*, Testudinidae), are highly regarded for their medicinal properties. In practice however, these are rarely accessible or used,

4. An additional bias against the collection of animal-based medicinals may have resulted from the fact that my role in the community was perceived to be more closely related to plants.

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due to the fact that their collection requires a considerable investment of time and energy, and frequently an element of chance as well.

Invertebrates are also an important source of medicinal resources. The oil of palm weevils, ***soso*** (*Rhynchophorus spp.*, Curculionidae), found in the seeds of *Attalea* palms, as well as in the trunks of all fallen palm trees, are highly esteemed in the treatment of respiratory infections, notably coughs. *Pseudomyrmex* ants inhabiting *Triplaris americana* L. (Polygonaceae) trees, are crushed and placed on toothaches or allowed to bite painful joints.[5]

Most widely reported and utilized vertebrate products are derived from fat and bones, but quills, spines, teeth, blood and bile are also used. I have already noted the widespread recognition of the use of sting ray, ***ibabi*** (*Potamotrygon spp.*, Potamotrygonidae) liver oil to facilitate birth. The ground jaw bone of the paca, ***se'ao*** (*Agouti paca*, Agoutidae), is also used to facilitate birth, while its bile (***pase***) is a well-known and highly prized treatment for snake bite. Finally, the blood of several animals, notably bats, ***biña***, and black caiman, ***shai'jame***, are one of the few medicinal resources employed for ***ñiñe***, or seizures and epilepsy. All these resources are widely known throughout the region and shared by Ribereños as well as other native Amazonians.

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[5]. Ramos-Elorduy and Pino (1988) report a similar use for *Pogonomyrmex* in Mexico. Groark (1996) reports the shamanistic and therapeutic use of a related group of *Pogonomyrmex* ants by native Californians in shamanistic and healing contexts. Ribereños other indigenous groups in Madre de Dios claim young men have their wrists bitten by scores of *Pseudomyrmex* poisonous ants in order to develop a "strong fist" ("un buen puño") in fighting.

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Other medicinal substances

In addition to plants and animals, the Ese Eja use an array of organic and inorganic substances as medicinals. Hydrocarbons, including gasoline, kerosene and petroleum, are all used in small amounts internally and externally to treat a number of conditions, including skin and respiratory infections and snake bite. The smoke of burning vulcanized or cured rubber, from and old shoe for example, is widely valued in the treatment of earache[6]. Alcohol, and to a much lesser extent over-the-counter prescriptions such as aspirin and aspirin-related drugs, are also used, though accessibility and cost is a major constraint, particularly among the Peruvian Ese Eja. Although most manufactured medicines are obtained though the mediation of specially trained health workers, more and more Ese Eja are having direct access to antibiotics and other drugs.

Several types of soils and clays are reportedly used in a number of external applications. One such case is the clay mud from cicada turrets, applied over cuts and wounds. Although there are instances of geophagy among the Ese Eja, notably among toddlers, such practice is reprimanded and not viewed in any way as "medicinal". Finally, human urine, hair and nails are also used in a number of internal and external treatments. The use of urine as a febrifuge is particularly well extended throughout the region and beyond.

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Ese Eja notions of medicinals

For the Ese Eja, health and well being depend on a wide range of factors and processes, over which the individual has only limited control. According to Ese Eja cosmology, individual well-being is entirely dependent on a host of vital yet unstable relations with other human and non-human, visible and non-visible actors (see chapter 6). Existence within this complex web creates an ongoing tension or conflict between individual needs and desires, and the obligation to compromise those needs in order to consolidate social relations through the practice of culturally-sanctioned exchange and reciprocity.

Just as the Ese Eja depend on the death and consumption of other beings for their survival, so does the survival of other beings, the ***edósikiana***, depend on the death and consumption of the Ese eja. From an Ese Eja vantage then, life and death are inextricably inter-linked through ongoing processes of exchange and predation. Illness and misfortune are seen as the manifestations of such conflict of interests between different beings in this cosmological web, and of the ability for some to succeed at the expense of others.

Interactions between different actors in this socio-cosmological web are not fixed. Rather, relations are continuously negotiated, as individuals try to maximize the

[6] The hot air associated with burning may be what actually soothes the pain.

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benefits accrued from social[7] life while minimizing its constraints and obligations, prolonging their roles as predators and delaying their role as prey. The power of medicinal resources, from an Ese Eja perspective, lies in precisely in their potential to manipulate the outcomes of an individual's relations with surrounding human and extra-human beings.

The role of medicinal resources as agents of transformation and manipulation of socio-ecological relations imbues them with a subtle but powerful aura of moral ambivalence. For example, some plants are used by Ese Eja women as a permanent contraceptive, allowing a woman to manipulate her body according to her own needs. The same substance however, can be administered secretly to another woman, as a form of revenge, thus constituting what is in effect considered a form of sorcery. Whereas both contexts involve "curing" through a medicinal agent, the moral contexts in both cases are diametrically opposed, depending on whose agenda is furthered and who manipulates change. Indeed, the Spanish term "curar" is used by the Ese Eja to refer to both healing and harming with plants.

Charms provide another important example of the ambivalence intrinsic to medicinals and "curing". A woman wishing to have an affair without raising suspicions of her husband for example, can secretly "cure" him with the use of

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[7]. I use the term "social" in a cosmological sense: that is, encompassing a web of interconnected and interdependent relationships between visible and non-visible, human and extra-human beings (cf. Albert, 1993; Viveiros de Castro, 1992).

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certain plants, thus manipulating his perceptions and behavior. Other plants may be used with the intent of sickening or even killing victims. Not all medicinal resources share the same shadow of socio-predatory behavior, however. Medicinals used to treat illness and injuries are less ambivalent and discussed, treated, used and exchanged more freely than medicinals used to control fertility and reproduction, or "pusangas": charms used to manipulate the perceptions, intentions and behaviors of others.

The bitter and the sweet: action and efficacy of medicinal resources

For the Ese Eja, all directly observable phenomena are manifestations of unobservable causative forces, agents, beings or relationships. The visible or ordinarily perceptible aspects of plants and animals reveal certain important aspects or qualities of the embodied and invisible ***eshawa***. Appearance, including shape, texture, color, smell, taste, as well as (where relevant), behavioral or ecological characteristics, all inform the specific meaning that is projected upon plants, animals and inanimate objects. Such associative logic guides Ese Eja resource perception, particularly in the context of health and nutrition. In chapter 6 for example, I noted how particular colors, textures, smells as well as presence of exudates or spines, are regarded as signs of danger and pollution in the classification of foods.

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Conversely, the medicinal activity of certain plant or animal products is interpreted according to the notion that they embody or represent particular desired or beneficial properties, which can be extended to a person through direct physical contact, through associative magic or contagion. A few examples will illustrate this principle:

- The long interpetiolar stem segments of one particular herbaceous climber, support the logic of lightly whipping the shins of toddlers to ensure they grow tall.
- The fruits of *Desmodium spp.*, which habitually stick to clothing as one brushes past the plant, are used to prevent miscarriages "as they help the child to stick to the womb".
- Sting-ray (*Potamotrygon spp.*, Potamotrygonidae) liver oil is a well known treatment to facilitate birth, a property which was explained to me on the basis of the animal's reproductive behavior: according to the Ese Eja, sting-rays are viviparous, and have a reflex whereby gravid females rapidly discharge all offspring when caught in fish hooks.
- ***sháwi*** (*Calliandra angustifolia*), is used to bathe young boys in order to make them resistant to colds and grow into strong ("fuertes"), hard-working, and courageous ("valientes") adults[8]. The plant itself is associated with cold: it

8. This practice has been abandoned in Sonene, reportedly because the plant does not grow in the area, though it is locally abundant upriver from where the community is currently located.

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grows in shaded areas, usually by rocky pools, and its hard wood[9], longevity and persistent showy Mimosoid flowers are all signs of vigor and "success".

In all these cases, the Ese Eja seek to co-opt or incorporate particular attributes of plants and animals through a sympathetic interaction effected by physical contact. As I mentioned in connection with foods, the logic of sympathetic magic also works in converse situations: hence, I was repeatedly cautioned not to touch *posia* (stick insects, Phasmidae), as I would become thin and anemic.

In some instances, knowledge of medicinal resources may have been obtained through direct observation of animal behavior. There is a growing literature on the use of medicinal plants by mammals, most notably primates, (see for example, Wrangham and Goodall, 1987). Given the intimate knowledge that hunters have of their prey, one might expect this type of learning to have played a role in medicinal resource selection. Tapirs, ***shawe*** (*Tapirus terrestris*, Tapiridae) for example, allegedly rub their wounds against the stems of certain species, including an unidentified Solanaceous shrub ("tohé del monte").

Learning through observation is also an associative process: observations in one context, animal behavior, are interpreted in another, human behavior. As I discussed earlier, in some cases, the associative link between a particular plant and its medicinal properties is effected symbolically as opposed to literally. As

9. Indeed, in one of the Ese Eja myths, ***sháwi*** is used to make a powerful bow that is used by a cultural hero to kill a ferocious aquatic monster.

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Alcorn (1982) pointed out however, these symbolic associations may be used to interpret, explain, or help remember the properties of medicinals, as opposed to actual means of identifying or selecting medicinals. Some examples include:

- The latex of several plants (e.g. *Euphorbia chamaesyce* L., Euphorbiaceae) is used to cover the breathing hole and to suffocate parasitic botfly larvae buried in its human host. The application of the latex of several plants, including that of ***ki'ano*** (*Maclura tinctoria* (L.)Steudel, Moraceae) over tooth cavities is explained by an associative process: the Ese Eja believe cavities to be caused by the ***eshawa*** of palm weevil larvae burrowing into teeth like the animals burrow into the trunks of several palms.
- Certain types of ***chihi,*** skin ulcers, are believed to be caused by (the ***eshawa*** of) minute fish who 'eat' away the flesh of their human hosts. The effect of certain plants applied over ***chihi*** is likened to that of fish poisons: indeed, ***shaka*** [*Tephrosia sinapou* (Buc'hoz) A. Chevalier, Fabaceae] is used both as a fish poison and as a cure for a number of skin infections, including scabies.

More frequently, specific tastes and smells are associated with certain general and specific properties. Bitter substances in particular are associated with substances used to treat illness:

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- During an ***emanokwana*** ritual, ***Bia***, the soul of an ancestor speaking through the ***eyámikekwa***, extols the property of a particular medicinal to the Ese Eja ***Kwiso***:

> *-(Kwiso) "me too, I am getting sick with dysentery, just like that woman who died".*
> *- (Bia to Kwiso) "you must take some of that vine...it is with that that we heal ourselves"*
> *- (Bia to everyone) "that vine that we see is bitter, and this is what cleans"*

The medicinal value of plants such as ***pase-pase*** [*Irlbachia alata* (Aubl.) Maas, Gentianaceae, "bitter-bitter"], ***akwi-pase*** (*Geissospermum reticulatum* A. H. Gentry., Apocynaceae "bitter-tree"), ***seboto wo'o, [****Eleutherine bulbosa* (Mill.) Urban, Iridaceae "red onion"], for symptoms associated with skin fungal infections. malaria and dysentery respectively, is explicitly and consistently linked to and explained by their strong bitterness. In these examples, the healing action associated with bitterness is explained by its purported ability to "clean" or "repel" the pathogenic ***eshawa*** seen to transgress and sicken the victim. Gray (1997:10) reports a similar attitude among the Arakmbut, who believe that pathogenic spirits, ***toto***, are repelled by bitter and stinging substances.

While as medicinals used to treat illness repel or expel ***eshawa*** through their bitterness or toxicity, charms or "pusangas" do the exact opposite: they seduce or attract the ***eshawa*** of potential game or sexual partners. Sweet or perfumed odors in particular, are associated with sex charms. Plants with strong pungent

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or turpentine-like smells, notably Monimiaceous and Piperaceous shrubs, are frequently associated with dog hunting charms, and used to sharpen their olfactory sense.

In all these cases, taste and odors trigger specific physiological responses, which are interpreted in culturally specific ways. Sweet tastes and smells trigger a sense of pleasure, which may elicit the memory of other physical pleasures, notably sex. Indeed, the association between sweetness, romance and sex is commonplace. Likewise, pungent smells provide a momentary sensation of heightened olfactory awareness, an awareness that could logically be extended to other domains where heightened sensory perception is vital to ensure success[10].

The explicit link between medicines and bitter tastes is also ubiquitous (e.g., Brett, 1994; Milliken et al., 1986:36, Milliken and Albert, 1996). Johns (1996) has suggested that the chemosensory perception of bitter tastes has an adaptive value insofar as the avoidance of potentially toxic compounds, particularly during the quest for foods in our evolutionary history[11]. Indeed, it is no coincidence that alkaloids, a very important group of toxic and medicinal secondary compounds, are almost universally perceived as bitter (Brett, 1994). From an evolutionary perspective therefore, the sensory ability to identify toxic compounds in order to

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10. The once widespread practice of nose-piercing among Ese Eja males was reportedly also associated to improving hunting success.

11. Likewise, sweetness is often associated with energy-rich, nutritionally promising, substances.

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avoid them in a nutritional context could also be used to select them in another medicine. Messer (1991) for example, found that chemosensory perception is the principal organizing factor in ascribing plants medicinal properties among the Oaxacan Mitla.

On the other hand, some authors have cautioned the need to distinguish between explanatory systems from the actual processes of selection (for example, Alcorn, 1982:332). Indigenous statements ascribing a causal link between certain physical characteristics and particular actions may actually serve as mnemonic devices to facilitate learning and memorization pertaining to resource use, or as retroactive interpretative mechanisms.

In effect then, an examination of how medicinals are identified and selected needs to go beyond a simple analysis of interpretative frameworks. Brett (1994) found that the Tzeltal Maya consistently use taste and odor, and particularly bitterness, to ascribe a medicinal potential, but such status is only accorded following experimentation. That is, the type of associative logic that characterizes indigenous perception of medicinals may play a dual role, on the one hand, identifying **potential** medicinals, while also interpreting the effects of known medicinals.

Attempts to distinguish empirical from symbolic, pharmacological from cultural, aspects of efficacy are analytically useful, but not always straightforward. One of

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the significant contributions of medical anthropology in the last decades has in fact been to show the power of symbols in all forms of curing (Moerman1983), and the importance of cultural processes in the construction of medical efficacy (Etkin, 1992).

The ambivalence of medicinals

Earlier I discussed how, in contrast to cosmopolitan notions of "medicines", Ese Eja medicinals are imbued with a moral ambivalence, in turn associated with their intrinsic potential to harm as well as cure.[12] The use of certain medicinals may also pose some direct risks to the user. This risk emerges from the notion that medicinals embody[13] entities with a will of their own: ***eshawa***. The therapeutic action of medicinals depends on the "strength" of their ***eshawa***, which at the very least entails overcoming, expelling or "killing" the illness or transgressive ***eshawa*** (cf., Brett, 1994). The animate beings embodied by these substances may, under some circumstances, turn against the user and ultimately threaten his or her own physical integrity (cf. Kvist and Barfod, 1991: 154).

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12. While cosmopolitan medicine recognizes that drugs can be "misused" and can be toxic through incorrect administration or dosages, it does not situate this behavior in the context of "intent", except in the case of "drug abuse", in which case the primary victim is the user. Conversly, the category of "poison" is negative, and hence also lacks the ambivalence of indigenous concepts of "medicinal".

13. It is important to note that even though a medicinal, such as a latex or oil derived from crushed seeds, is not considered animate in itself, the substance is a physical manifestation of an invisible entity, characterized as ***eshawa***, which is animate and which does have a will and needs of its own.

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Not all medicinals pose equal risks to users. "Stronger" substances and medicinals are perceived as more powerful and hence more dangerous. A high degree of efficacy may thus be associated with a higher risk. Some medicinals, such as *Ficus insipida* Willd., ***etona***, are actually feared, as their effectiveness is paralleled by a "fierceness" which can ultimately sicken and in some cases even kill the user. Others, like ***esajo*** (*Psidium guajava* L.), are not as "strong", therefore generally safe, and more reliable as a medicinal resource.

In some cases, within the same species, some individuals or populations are considered safe, while others are not. As an Ese Eja mother once advised in relation to ***shaka 'ai***, a vine (indet.) used to help restless babies sleep at night;

> *"some shaka'ai have ..strong spirits ("espiritus fuertes")...who can kill our children...we do not use those, we only use those which are good"* (Sonene, May, 1995).

Incidentally, this ambivalent status is shared by some non-medicinal species as well. Certain populations of *Guadua spp.* for example, used to make arrow tips, are thought of as "belonging" to the ***edósikiana***, who use them to make their own arrow tips. Harvesting these would incur the wrath of the ***edósikiana***, and hence are reportedly not used. Usually, it is the ***eyámikekwa*** who advises individuals as to status of the plants in question. Once a "population" is identified by the ***eyámikekwa***, knowledge of its status is passed by word of mouth.

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Medicinals are thus not only used to manipulate individual natural and social relations: as animate beings and as embodied ***eshawa***, they themselves **are** part of that universe. As a result, interaction with medicinals is often constructed in social terms.

The use and selection of medicinals

Most illness episodes tend to be minor, particularly among adults. Common symptoms such as diarrhea, fever, coughs, or headache are often left untreated for a period of time ranging from one to a few days, particularly if these are bearable and do not appear to worsen. In practice then, many minor illness episodes are never treated with medicinals (Peluso, unpublished data). The decision to use a medicinal resource is usually motivated by aggravating, severe or persistent symptoms, as well as by the nature of the patient. Young children are considered particularly vulnerable, and more likely to be promptly treated than are adults.

The decision to employ a medicinal often involves a choice between a number of alternative treatments. At the onset of treatment, medicinals are selected primarily according to their accessibility, rather than on considerations of efficacy alone . Failure of a medicinal to eliminate symptoms may be interpreted as a sign that the ailment in question requires a "stronger" treatment. Alternative treatments are sought and utilized sequentially, a strategy which Brett (1994:62)

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has termed "lateral resort to therapy." It is only as initial treatments fail, that efficacy, as opposed to accessibility, becomes a primary criteria for selection (see chapter 7). Subsequent failures, however, will usually be interpreted as a sign of a more serious condition, eventually requiring specialist treatment from a shaman, health worker or doctor (cf. Berlin and Berlin, 1994; Evans-Pritchard, 1976:197).

This strategy could be interpreted as a pragmatic attempt to find the most economic solution to a particular health crisis. The "cheapest" treatments, in terms of time and resources allocated, are sought first and foremost. If symptoms persist or increase, considerations of efficacy become paramount, leading to an increase in the amount of time or resources expended, possibly culminating in a trip to see a neighboring healer or to the hospital.

Outcomes of medicinal resource utilization retroactively inform estimations of both efficacy and diagnosis. The elimination of symptoms is taken as evidence of efficacy and correct diagnosis (cf. Gray, 1997: 67, for the Arakmbut). The treatment last used before the symptoms disappear is assumed to be responsible for having effected the cure, and the efficacy of previous treatments may be questioned. Hence, experimentation is important in establishing individual criteria to evaluate the effectiveness and use of different resources. The following incident illustrates a sequence of events regarding the use of a medicinal:

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One morning, our friends and neighbors noticed that the right thigh of their 9-month son, ***Sijaja***, was swollen, and that he could not move it. At first, their older daughter ***Posi***, who spent much time taking care of her younger sibling, was accused of neglecting the child and accidentally dropping him. Another sibling was then accused of having stepped on ***Sijaja***. When the swelling failed to subside and as ***Sijaja***'s parents discussed the matter with their kin, it was suggested that the spirit of ***eji*** (*Manihot esculenta* Crantz.) had "pierced" or shot an invisible arrow, (***kekwanahe***, "chonteado"), through the child. This in turn was attributed to negligence, as the parents had left the tubers lying close to the sleeping child. Another form of negligence had entailed letting the child play on a wheelbarrow used to carry manioc from the fields. After a few days, the mother wrapped Sijaja's thigh in the leaves of ***kwi'o shaja 'ai***, *Potomorphe peltata* (L.) Miq., but this had no visible effect. The local nurse's advice was sought at that point, who gave the child a pain killer. While this had a calming effect, the treatment did not subdue the swelling or improve mobility. Finally, the father crushed the leaves of "oreja de burro" (*Kalanchoe pinnata* Lam.) a recently introduced medicinal, applying them as a compress over the affected area. Within a day, the swelling subsided and by the third day, the child had almost full function of the leg.

The fact that the child improved following treatment with a medicinal plant was seen as hindsight proof that the child had not been attacked by the spirit of

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manioc, and that its swelling was simply due to an accident or fall: the former would not have responded to a medicinal. Furthermore, the efficacy of *Kalanchoe*, was confirmed and its status upgraded, in contrast to that of *Potomorphe*. Although the parents could have taken the child to the ***eyámikekwa*** as a first recourse, this would have entailed an economic investment through obligatory reciprocity, which was effectively avoided.

Treatments and disease categories

Criteria for selecting herbal remedies are based primarily on visible symptoms (cf. Evans-Pritchard, 1976:195), rather than on a diagnostic evaluation of the cause. Indeed, as I illustrated above, diagnosis is frequently effected retroactively, and is informed by Ese Eja nosological categories, including ***kwia' kanahé***, ***jemí-kaní*** and ***kekwa-kánahe.*** In contrast, choice of treatment is initially and primarily dictated by symptoms.

At the outset of an illness episode, a number of possible explanations or nosologies are sought, usually based on recent dietary, sexual and social behavior. In the incident described earlier, involving ***Sijaja***'s ***shejee*** ('swelling'), selection of treatment was not contingent on presumed causes, but on the symptoms: swelling, redness and localized high temperature. Indeed, the converse is true: through the outcomes- positive and negative- of treatments, a diagnosis was eventually constructed.

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This process suggests there are two levels of medical logic operating simultaneously: one based on visible symptoms and the somewhat experimental use of medicinal resources, and the other based on theories of disease causation and diagnosis. Clearly, both are dialectically interrelated. Furthermore, particular symptoms, namely rare or dramatic conditions such as seizures, loss of consciousness or violent diarrhea and vomiting, are evidence of more serious illnesses, usually directly involving the ***edósikiana*** or sorcery, which require urgent attention from a specialist. Although Ese Eja medical specialists, notably shamans, may use ayahuasca or tobacco, the use of medicinal resources in Ese Eja shamanism is rather limited.

Hence, while diagnosis relates to causes and forces that are not ordinarily visible, treatment relates to immediately visible symptoms. Moreover, because medicinal treatment categories such as ***kiyo*** (fever) or ***see-see*** (diarrhea) reflect clusters of physiological symptoms, there is a broad correlation between Ese Eja treatment categories and cosmopolitan physiological categories (see chapter 9).

Medicinal resources and shamanism

Like shamanistic knowledge, knowledge of medicinal resources constitutes a powerful resource to avoid and treat illness, and to ensure well being. Like shamanistic knowledge too, though to a much lesser degree, ***shemeyo*** is

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imbued with an element of moral ambivalence and social ambiguity implicit in the cultural interpretation of the acquisition of knowledge and power. Both realms of action also expose the actor to certain risks.

Medicinal knowledge, however, can be apprehended faster and easier than shamanistic knowledge, does not require the same degree of specialist intervention, lacks much of the overt ritual of shamanistic behavior, and is generally more widely shared and used. These differences are less marked among some types of medicinals. Medicinals used in fertility regulation, hunting, or for unusual or more serious ailments for example, frequently involve more elaborate ritual, are more associated with specialist knowledge, and are not as widely shared and exchanged than those dealing with common illness symptoms.

An important difference between medicinal resource use and shamanistic behavior lies in their social contexts. While shamanism is primarily a social activity in that it often entails or even necessitates the presence of a group, medicinal resources are frequently employed in solitary contexts. As Evans-Pritchard noted for the Azande, "medicines are an individual possession... used at the discretion of their owner and for his own ends" (ibid: 182). Charms in particular are often used in solitary or secretive contexts, but even those

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medicinals used to treat common symptoms are also frequently prepared and administered by one person, and rather discreetly.[14]

Pharmacology and medicinal resources

The ethnopharmacological literature of the last 20 years has provided strong evidence that, in general, medicinals have a pharmacological component to their effectiveness, thus explaining their past and present role in the development of allopathic medicines (e.g. Balick, 1990; King and Tempesta, 1994; Lewis and Lewis, 1995; Soejarto and Farnsworth, 1989; Vlietinck and Berghe, 1998). I have already noted the adaptive value of chemosensory perception in avoiding and selecting plant secondary compounds in different contexts (Brett, 1994; Johns, 1996), as well as the prevalent tendency for humans to associate bitterness with toxicity and with medicines. Furthermore, native pharmacopoeias demonstrate patterned selection of plant resources with respect to floristic diversity and composition, both at family and infra-family levels of taxonomic organization (Moerman, 1979,1989, 1991).

Due to practical limitations, I was unable to test directly the pharmacological basis of Ese Eja medicinal resources. Of course, negative results in specific

14. This discreetness may be part of the cultural norm observed during illness episodes, which include an outward casual and unconcerned attitude toward the condition of the patient. Overt expressions of concern, worry and anxiety are seen as dangerous and counterproductive, since they are believed to strengthen the force with which the pathogenic *eshawa* maintains its "attack". Outsiders frequently misinterpret this response as a sign of lack of affection and care for others.

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bioassay or tests do not ascertain lack of pharmacological activity. As Alcorn (1982) has pointed out, there are numerous potentially important contextual variables that are eliminated during formal pharmacological evaluations. These include synergistic effects between different admixtures, as well as between foods and medicines. Numerous, and often complex interactions of secondary factors during collection, preparation and administration of medicinals are also excluded in most formal evaluations. In addition, the kinds and levels of secondary compounds in plants frequently vary genetically, phenotypically, and in response to its developmental stage or to such environmental conditions as exposure, soil type and levels of competition or herbivory (Janzen, 1978; McKey, 1979). While many of these environmental and varietal factors may be recognized and taken into account by indigenous ethnobotanical practices, they are again frequently not incorporated in formal evaluations of medicinals (Alcorn, 1982; Elisabetsky, 1986)

In the absence of direct evidence, there is an indirect means to evaluate the pharmacological potential of medicinal resources. Once an empirical basis to medicinal resource selection and utilization is recognized then, in general, consistent use over a wide geographic region or over historical time, may be considered as indirect indicators of medical efficacy (e.g. Elvin-Lewis, 1986; Fratkin, 1996; Milliken et al., 1986; Ortiz de Montellano, 1975). The use of consensus has also been used within discrete populations as an indicator of possible pharmacological efficacy (Trotter and Logan, 1986, Johns et al., 1990).

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Appendix 1 lists the most commonly reported medicinal resources and the literature supporting its pharmacological activity or ethnomedical use, following a non-exhaustive literature search, and a protocol to respect the intellectual property rights of the Ese Eja, described in further detail in chapter 2.

The socio-cultural identity of medicinals

As I described earlier, the Ese Eja make an explicit distinction between 'medicinals of the outsiders' ("remedios de deja", ***dejaha shemeyo***) and 'medicinals of the ancestors', ("remedios de los antiguos", ***etiikianaha shemeyo***). In some cases, as with recently introduced plants, the category of ***dejaha*** refers to the plant species themselves. Exotic species such as *Kalanchoe pinnata*, *Acmella ciliata* (HBK) Cass. (Asteraceae), *Jatropha gossypiifolia* L. and *J. curcas* L. (Euphorbiaceae), were all originally brought into Sonene as cultivated medicinals, and subsequently spontaneously propagated throughout the community. Other species, such as *Datura suaveolens* Humb. & Bonpl. (Solanaceae), may have been native to the area or at least introduced much earlier, but have only recently been incorporated into the repertoire of Ese Eja cultivated plants and medicinals. As such, they are considered to be ***dejaha*** by the Ese Eja.

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The status of ***dejaha*** is not limited to introduced, cultivated species, but is utilized to categorize specific treatments as well. The use of ***baweya***, *Philodendron lechlerianum* Schott. for the treatment of snake bite for example, is ***dejaha***. As a native plant resource, *Philodendron* has always been part of the botanical universe of the Ese eja, but its role in the treatment of snake bite is explicitly associated to contact with ***deja***. In several cases, the same medicinal resource will have some activity contexts associated with ***deja***, and others with Ese Eja. Hence, the use of *Salix humboldtiana*, ***besiikwiji***, to treat symptoms of diarrhea is associated with ancestral knowledge and thus ***etiikianaha***, whereas the use of it for headaches is ***dejaha***.

Increased contact with ***deja*** is not only associated with the introduction of new cultivated and agrestic plant species. It is also associated with the net displacement away from the headwater regions toward the mouths of rivers, and this migration has entailed contact with a different configuration of wild plant resources. Species such as *Ficus insipida* and *Bertholletia excelsa*, typical of the lowland forests, are thus associated to ***deja***, both ecologically and ethnobotanically.

The tendency for the Ese Eja to classify treatments based on their "identity" also means that some activity contexts are broadly recognized as related to ***deja***. ***Kono***, intestinal parasites, is an example. Many Ese Eja do not consider intestinal parasites to be a serious health problem, and treatment of gut worms is

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generally imbued with ***dejaha*** significance. Other activity contexts, such as sting ray stings, for example, are not ***dejaha*** in themselves, but most of medicinal resources associated with them are. Most activity contexts, including ***see-see*** (diarrhea), ***kiyo*** (fever), ***oho*** (coughs), etc. include both ***dejaha*** and ***etiikianaha*** medicinals.

The categories of ***dejaha*** and ***etiikianaha*** reflect the degree of cultural familiarity with species or activity contexts. As such, these categories are somewhat variable in time and space. Plantains, ***ejawi***, which are not native to Amazonia, are considered ***etiikianaha*** *par excellence*. As I noted in chapter 5, plantains were, in some cases still are, the staple crop, and one of the few plants to figure predominantly in Ese Eja mythology and shamanistic rituals. The claim that plantains are not native to the Ese Eja would be as preposterous to them as claiming American ancestry for the potato or tomato to an Irish or Sicilian farmer respectively. Indeed, a brief examination of almost any country's national cuisine, will almost invariably reveal that many "typical" ingredients are in fact fairly recent introductions.

There is a third group of medicinals, whose status is unclear or contested among different community members. There appears to be little agreement for example, as to the status of ***showé*** [*Malvastrum coromandelianum* (L.)Garcke, Malvaceae]. These may be plant resources which are on the way to becoming fully incorporated and identified as ***Ese Eja*** as opposed to ***deja***.

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The projection of labels of social identity onto plants introduces an important socio-cultural dimension to plants and their utilization. For one thing, plants are used as political resources, through which individuals articulate their relationship with their social environment, and more specifically with ***deja*** versus ***Ese Eja***.

The introduction of medicinals

The diffusion of "new" medicinal resources is a remarkably fast and effective process. *Erythrina berteroana* Urban (Fabaceae) was first brought into Madre de Dios, Peru, by Shipibo-Conibo healers visiting the region as part of a primary health-care program in 1987. It was originally planted in "Centro Ñape", a health a community Center within the territory of Infierno (Alexiades and Lacaze, 1996). Within four years the plant has been extensively transplanted and utilized as a live fence, medicinal and, more recently, as forage for guinea pigs[15], among all the Peruvian Ese Eja communities.

Delegates from the various communities visited *Centro Ñape* at various times, to participate in the project or attend workshops. Upon returning to their communities, they frequently brought with them an assortment of plants, which

15. Guinea pigs were introduced into Peruvian Ese Eja communities as part of an Italian development program, CESVI, which sought to increase domestic production of protein. For a number of reasons, guinea pig raising has not been widely adopted and may disappear altogether.

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were subsequently propagated and incorporated into the ethnomedical repertoires of their communities. At least a dozen commonly cultivated medicinal and other plants in Sonene were brought by two people, who traveled to the community of Infierno on just two occasions. Though encouraged by the project's activities and agenda, this diffusion happened spontaneously. Indeed, when I started working in Portachuelo, I was surprised to find that a number of cultivated medicinals, including *Jatropha gossypifolia*, were brought in by Ese Eja who regularly go to visit relatives in Peru, several hundred miles away.

Although "Centro Ñape" and AMETRA 2001 are a somewhat unusual and recent example of a catalyst for exchange and diffusion of plant resources and ethnobotanical knowledge, the process is definitely not new. I have already discussed the example of plantains in Ese Eja society. Over half (58%) of the 190 Ese Eja plant medicinals inventoried to date are explicitly identified by the Ese Eja as having been incorporated in recent years, and an additional 12% have either an ambiguous or mixed status. Though my sample may be biased toward ***dejaha*** species, the evidence does indicate that contact with ***deja*** has resulted in significant diffusion and incorporation of medicinal resources. This pattern becomes even more apparent when medicinal resources are evaluated with respect to their salience and "importance". As I show in chapter 9, most of the medicinal resources used on a regular basis to deal with the major health problems are in fact ***dejaha***. The importance of introduced medicinals may be underestimated in other regions too. Prance and Plana (1998) for example,

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report there are 156 species of exotic cultivated plants commonly used as medicinals in South America.

There is additional ethnographic and linguistic evidence to suggest the importance of recent historical contact in shaping perceptions of medicinal resources. At the outset of the thesis I recounted how, at a certain level discourse, the Ese Eja explicitly identify plant medicines as the product of contact:

> *"...our ancestors practically used no medicinals...they cured themselves only with the* ***eyámikekwa****...through the* ***edósikiana****, the* ***eyámikekwa*** *cured everything, all kinds of sickness [from the forest].."* [Sonene, May, 1995]
>
> *"when we first came here [before there were whites] there was no illness and we knew no medicines...[all we did] was bathe with plants.."* [Portachuelo, September, 1994]

These sentiments, repeated in numerous occasions and contexts, need not be taken literally. I do not think the Ese Eja themselves believe that before intensified contact with ***deja*** the Ese Eja knew no illnesses or used medicinals. Moreover, the same people have at other times discussed with me medicinals reportedly used by the very same ancestors. Rather, I suggest, these idealized statements express a shift in the relative importance of medicinals in Ese Eja health care.

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Linguistic evidence further supports a historical shift in the role of medicinals in Ese Eja ethnomedicine. When referring to medicinals, the Ese Eja most frequently use the Spanish term or its Ese Eja derivative, ***shemeyo***. The Ese Eja cognate ***eshikwiji*** is used subordinately to the Spanish derivative. Strictly speaking, ***eshikwiji*** ("rubbing-for") refers to substances applied externally[16]. Frequently however, ***eshikwiji*** is used as a synonym to the borrowed term ***shemeyo***, that is, as a generic for all medicinal agents. The lack of a clearly-defined and widely employed generic cognate for "medicinal" among the Ese Eja contrasts with other Amazonian groups (cf. Baer, 1992: 84 for the Machiguenga; Langdon, 1992:46, for the Siona; Tournon, 1990, Tournon et al., 1986, for the Shipibo-Conibo), and could be accounted for by one of two possible scenarios.

The first is that ***eshikwiji*** corresponds to the term traditionally used for medicinals, and that most of these were applied externally. Accounts from elder suggest that this may be the case. In addition, the verb stem for shamanistic curing [***mishi***] literally means "extracting pieces" (Chavarría, pers. com., February, 1998). The act of ***eyámikekwa*** curing is inextricably linked to the removal of the invisible pathogenic ***edósikiana*** arrow through the "rubbing", massaging and pulling, of the affected area. ***Eshikwiji*** could thus be the "traditional" term for medicinals that are falling into disuse, following the increased and changing role of medicinals in Ese Eja curing practices.

16. I have also collected another, unconfirmed, term, *ejáshijakiji*, used specifically for medicinals that are ingested. However, I am not sure if this second term is widespread.

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A second possibility, is that the term ***eshikwiji*** has been developed retroactively by the Ese Eja in response to the term and concept of "remedio". As I noted at the outset, the characteristics of Ese Eja language lends itself to this kind of linguistic adaptability and retroactive "inventions".

Whatever the relationship between Ese Eja and Spanish terms may be, the fact that the Spanish derivative is used most consistently, even in the midst of Ese Eja phrases, indicates a close association between the concept of "medicinal" and contact with ***deja***.

Though the Ese Eja may be somewhat of an unusual example of the extent to which plants have recently been incorporated into an indigenous medical system, it is also possible that the degree to which indigenous ethnobotanical systems reflect recent historical processes and change has been underestimated (but see Davis and Yost, 1983b). The evidence and implications for this scenario are further discussed in chapter 11.

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Chapter 9.

The Distribution of Knowledge: Salience and Utilization of Medicinal Resources

Introduction

In the previous chapter I presented a broad description of Ese Eja medicinals, illustrating how their status as "resources" is determined both by the properties of the substances themselves and by the needs and perceptions of the Ese Eja. The fact that medicinals are in part cultural artifacts, whose characteristics are a function of dynamic and variable socio-cultural processes, introduces an important yet frequently confounding element of variability in how medicinals are perceived and utilized.

In this chapter I will focus on the degree to which knowledge, perceptions and behaviors are shared, in an attempt to identify the most salient or prevalent medicinal species and activity contexts[1]. In order to do this, I will examine the distribution frequencies of verbal responses from a sample of 85 Ese Eja adults, collected through the use of semi-structured interviews in three communities. In order to better understand how and why the Ese Eja favor some resources over

1. Throughout my discussion, I will use Balée's (1994:49) term "activity context", rather than "use", not only to highlight the "reciprocal nature of these activities", but also because the former emphasizes the cognitive, perceptual, and not just behavioral, aspects that characterize human-plant interactions.

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others, I will explore the specific roles of several ecological and socio-cultural processes in shaping resource perception and selection.

Through my discussion of distribution of knowledge of Ese Eja medicinal resources, I also seek to address the broader theoretical question of quantification in ethnobotany, especially in relation to the evaluation of "importance" or "cultural significance" of plant resources. Using my data, I will compare two common approaches to ranking plant resources, one consensus-based and hence related to salience, and the other based on the tallying of number of activity contexts. Through the use of specific examples, I will illustrate some of the methodological challenges implicit in the attempt to rank plant resources and qualify the value of quantitative models and plant-based elicitation techniques in contemporary ethnobotany.

Ethnobotany and the evaluation of cultural significance of plants

Since their inception as academic disciplines, ethnobotany and related disciplines within anthropology have concerned themselves not only with describing the range and characteristics of human-plant interactions, but also with ranking and ordering interactions on the basis of their "importance" or significance to human affairs. Hunn (1982) defined the cultural significance of a plant taxon as the importance of the role that it plays within a particular culture.

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The multiple levels at which plants play significant roles in human society-biochemical, ecological, evolutionary, cognitive, symbolic and socio-political-makes the evaluation and ranking of plant resources conceptually and methodologically complex and challenging. By prioritizing and, more importantly operationalizing, human-plant interaction certain biases are inevitably introduced. Thus, while the broad ranking of plant resources or descriptions of the significance of individual plant species can be a fairly straightforward (e.g. Bates, 1985; Wilbert, 1976), determining the relative importance of plant resources within narrower contexts or in more precise terms can be much more complicated.

Ethnoscientific approaches have traditionally used linguistic or taxonomic analyses of emic categories to rank and order human-plant interactions. Noting a correlation between the structure of plant names and the characteristics of ethnobotanical relations for example, Balée and Moore (1991; 1994), analyzed Ka'apor plant lexemes to derive conclusions as to the history and significance of specific human-plant interactions. Through formal exercises, such as pile sorts, ranking and sorting (cf. Werner and Schoepfle, 1987), ethnoscientists can elicit native perceptions as to hierarchical relationship between different plant resources with respect to particular attributes, such as perceived efficacy, taste, etc. (e.g. Barrett, 1994).

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In contrast, ecological anthropologists and cultural materialists have evaluated human-plant interactions on the basis of etic criteria, assumed by the researcher to reflect the causative processes that shape and ultimately explain much of human behavior. Direct observations of dietary behavior and nutritional composition of different plants for example, have been used to establish the relative importance of different plant resources (Fleuret,1976). Likewise, time-energy budgets and related techniques have been used as means to evaluate the importance of different food resources (e.g. Dufour, 1985; Johnson, 1975).

The above examples illustrate two major approaches to the assessment of the importance of plant resources in human society. Emic approaches hinge on the use of native categories as the means to operationalize and rank plant resource importance. In contrast, etic approaches use scientific criteria and assumptions, frequently not shared by the actors themselves. For example, native rankings of medical "efficacy" may differ from pharmacological or biomedical appreciations, given the fact that different cultural expectations may be projected into the evaluation process in each cultural context (Etkin, 1992). In actuality, many approaches to ranking and quantifying plant resources adopt a combination of emic and etic approaches, thus according different weightings to what is often a different aspect of "importance".

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Defining operational variables is frequently even more complicated than choosing the general criteria or contexts with which to rank plant resources. In some cases, estimations are made empirically or intuitively. Berlin et al.(1974) for example, ranked Tzeltal plant resources according to the degree of management, and according to such broad categories as "wild", "semi-cultivated", "cultivated", and "domesticated". While this is an effective and practical approach suited for some purposes, its use is limited when attempting to develop a more detailed analysis. How then for example, following this example, would one evaluate the relative significance of different "semi-cultivated" plants? For one thing, it is very likely that some are managed more intensely than others. Ranking of "semi-cultivated" species according to management then, would depend on a more precise definition of "management". A number of behaviors or context would This would first require an assessment of the range of behaviors included under the term "management", selecting specific behaviors or contexts and operationalizing them.

Ethnobotanists have attempted to develop systematic approaches to ranking and comparing the value or "importance" of plant resources in specific contexts. Turner (1988) for example, developed a quantitative model to evaluate the cultural significance of Salish plant resources, whereby the "quality", "intensity" and "exclusivity" of uses were subjectively evaluated and combined to develop a numerical index of importance. Stoffle et al. (1990) refined this model by

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limiting the dependence on subjective measures and incorporating additional variables, namely plant management and the degree to which particular resources remain viable and utilized.

Earlier quantitative approaches were based on the simple addition of number of "uses" to develop estimates of value for particular forest communities (e.g. Boom, 1989). These efforts have become increasingly sophisticated, as details concerning the characteristics of plant resources (Pinedo-Vásquez et al., 1990, Prance et al., 1987), informant sample, and degree of consensus have been factored in (Adu-Tutu et al., 1979; Amorozo and Gély, 1988; Friedman et al., 1986, Trotter and Logan, 1986; Johns et al., 1990, 1994; Johns and Kimanani, 1991; Kainer and Duryea, 1992).

The use of consensus-based models to rank the cultural salience of plant resources originally developed from ethnoscience, which views culture as a shared and learned "information pool" (D'Andrade, 1981:180). Here, consensus is seen to be correlated to informant knowledge and competence for specific semantic domains (Boster, 1986; Romney et al., 1986). Consensus-based models have been used in ethnopharmacological studies to identify physiologically effective medicinal plants. In these cases, a positive correlation is posited between consensus and pharmacological efficacy (e.g. Berlin and Berlin, 1994; Trotter and Logan, 1986). The model used by Johns et al. (1990, 1994) also assumes such a correlation, but is more sophisticated in that it

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factors out abundance of both plant species and different ailments, and thus evaluates consensus independently of these two variables.

More recently, Phillips and Gentry (1993a, 1993b) incorporated the number of uses or activity contexts per species in their formal assessment of consensus. According to this model, species accorded a larger number of "uses" by a larger number of informants have the greatest cultural salience. Evaluation of plants in this case however, was not limited to medicinal resources.

In every instance, plants are ranked according to specific agenda. Retormulation of the focus or purpose of the ranking system is thus very likely produce different estimations of rank.

Data collection and analysis

The data used in this analysis were collected during semi-structured interviews, conducted between 1994 and1995, with a total of 34 and 51 men and women from the communities of Sonene, Portachuelo Alto, Portachuelo Bajo, and Villanueva. At least one adult member of every household was interviewed. In several cases more than one adult per household was interviewed. Because Sonene and Villanueva are much smaller than Portachuelo, the sample of informants is proportionately somewhat skewed toward the former. Moreover, the sample has an age and gender bias. Children and very old people were not

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interviewed. Moreover, the sample included more women than men, as the former were more amenable and/or available for household interviews than the former[2]. Hence, while the sample may not be statistically representative of the Ese Eja as a whole, it is large enough to permit some valuable, albeit tentative, observations on the distribution of Ese Eja medicinal resource use and knowledge.

Ethnobotanical data was elicited using an interview guide of a list of commonly used Ese Eja medicinal activity context categories. Medicinal activity contexts and background information regarding Ese Eja nosological categories were gathered beforehand, through the use of a wide range of ethnobotanical and ethnographic field techniques and research contexts. These included participant-observation, informal, open-ended and semi-structured interviews, group interviews, participatory exercises, and plant-collecting trips with informants in different vegetation zones[3].

The list of activity contexts symptoms derived from these exercises was compiled and checked with two key informants in Portachuelo and Sonene, ensuring its completeness prior to the commencement of interviews. Some minor modifications were made to the interview guide over time, namely the incorporation of two minor activity contexts and the elimination of a few others, whose characteristics were not suited to this form of more structured inquiry.

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3. See chapter 2 for an additional discussion on the methodologies and techniques employed.

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Specifically, charms were not included, as knowledge of these resources is not as openly and freely discussed as other medicinals, for the reasons outlined in the previous chapter. Hence, while such knowledge was frequently, albeit somewhat serendipitously, recorded during the study and discussed in some detail in chapter 8, it was not included in this analysis due to reactivity issues associated with data collection during formal interviews. My field observations and remaining data suggest that these activity contexts are quite important however, and so their omission from this data set significantly weakens the scope of my analysis. Despite this gap, I am confident that the most commonly used Ese Eja medicinal resource activity context categories were included in my sample of elicitation frames, particularly in relation to the treatment of the organic symptoms of illness.

In contrast to their assessments of efficacy, which are retroactively constructed with reference to etiological categories, the Ese Eja generally select and classify medicinal resources on the basis of the physical symptoms of illness, as opposed to presumed causes (cf. Messer, 1991:108). This coincides with other appreciations of indigenous plant medicine utilization (e.g. Davis and Yost, 1983b: 281; see also Brett, 1994)[4].

4. Davis and Yost (ibid) remark that the Waorani "did not classify diseases, but rather treated symptoms". While the Ese Eja do classify diseases, symptoms are of primary importance in selecting treatments.

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As Johns et al. (1994) correctly note, eliciting data through the use of frames, in this case activity contexts, may introduce biases, as informant responses are limited by the boundaries imposed by researcher questions. On the other hand, the use of a comprehensive and culturally meaningful list of categories minimizes these biases (Browner, 1985).

During interviews, we asked informants to provide information on as many treatments as they wished for each activity context. We collected information regarding the collection, preparation and administration of each medicinal. We also made notes on the reported source of the knowledge , history of personal use, and individual preferences and estimations of efficacy, compared to other treatment options. Each medicinal substance reported for each activity context by each informant was tallied separately in the final data analysis. Confirmation of reports by the same informants were not tallied in the data analyses, though such confirmations were sought to ensure data reliability and accuracy (Bernard, 1994). About 10% of all reports involved preparations with more than one medicinal substance. In these cases, each medicinal in the preparation was tallied separately in the final data analysis.

Taxonomic identifications of medicinals were obtained by making good quality herbarium specimens of each species, according to the protocols discussed in

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chapter 2. No animals were collected, and hence positive determination of these is limited to well-known species.

Due to the depth and extensiveness of materials covered, interviews were often broken up into several sessions, separated by anywhere between hours to weeks. While we always attempted to interview people alone, minimizing bias through interference and interaction between several informants, in practice this was not always possible. These two conditions violate some of the requisites for statistical analysis, in that the mutual independence of different answers was sometimes violated. In practice however, this was unavoidable. Ideally, we should have interviewed all informants twice or, alternatively, obtained systematic confirmation of all reports. Again, this was impossible due to time and other practical constraints.

In several studies (e.g. Johns et al, 1990, 1994; Trotter and Logan, 1986), authors only include in the final analysis treatments confirmed at least 3 times. I have followed the same procedure for the comparative analysis of medicinal resources, but all reports were included when comparing the salience of different activity contexts (see chapter 9). In this case, even if some individual reports are errors, in that the "wrong" species was reported, they are still valid in that they represent a response to a culturally valid, recognized, activity context. Inclusion of unconfirmed reports in my calculation of IAR (see below) for

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activity contexts no doubt lowered the overall numeric indices. Actual rates of consensus may thus be higher than those shown here, at least in some cases.

In my analysis, I adopt an ethnoscientific approach by viewing consensus as a measure of cognitive salience, and hence cultural significance. In an attempt to identify clinically effective herbal remedies among Mexican Americans, Trotter and Logan (1986) devised an index to quantify the degree of consensus between informants. The Informant Agreement Index (IAR) used by Trotter and Logan is summarized by the following formula:

$$IAR = \frac{(\text{Total Cases of Ailment in Sample}) - (\text{Number of Separate Remedies for Ailment})}{[(\text{Total Cases for Ailment}) - 1]}$$

For each activity context category (i.e. "ailment"), the total number of medicinal resources reported is subtracted from the total number of reports for that category. That figure is then divided by the total number of reports for that particular category, minus one.

Although Phillips and Gentry (1993a) also developed an index to estimate "importance" based on the combined use of consensus and number of uses reported, its use is not applicable to this data set. This is because their index was constructed for data obtained through the use of plant species, as opposed to treatment categories, as elicitation frames. Likewise, the model developed by Johns et al. (1990) is not applicable here, since my objective is to identify the

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most salient medicinals from an Ese Eja perspective, as opposed to the most effective from a biomedical standpoint.

Salience of Activity Contexts

Results from the survey are summarized in table 9.1. The first four columns provide different measures of the type and scale of response elicited by each activity context: the total number of reports, the number of medicinal resources (plant species, animal species and miscellaneous substances) associated with each activity context, and the percentage of informants who identified medicinals for each activity context (i.e. the response rate).

From these data, it is clear that some medicinal activity contexts have greater salience than others: that is, some activity contexts elicited more individual responses and from a greater percentage of informants, than others. ***See-see*** (diarrhea) for example, elicited a response from 80% of informants, with individual responses averaging three medicinal resources, and in one case totaling seven different resources.

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Table 9.1 *Ese Eja most salient medicinal activity contexts and species.*

ACTIVITY CONTEXT	NO. OF REPORTS.	PLANTS	OTHERS	RESPONSE RATE (%)	IAR	MOST WIDELY REPORTED MEDICINAL	
see-see (diarrhea)	246	35	1	84	0.9	*Psidium guajava* L.	18%
						Triplaris americana L..	15%
kiyo-kiyo (fever)	120	34	3	77	0.7	*Malvastrum coromandelianum* (L.)Garcke	12%
						Ocimum micranthum Willd.	9%
eshe (scabies)	95	21	2	57	0.8	-	32%
						Copaifera paupera (Herzog)Dwyer	25%
se' nee (tcothache)	91	17	3	62	0.8	*Maclura tinctoria* (L.)Steudel	54%
						Acmella ciliata (H.B.K) Cass.	8%
						-	8%
koja wo'o (conjunctivitis)	61	13	1	38	0.8	*Piper peltatum* L..	57%
						Bixa orellana L..	11%
tee-nee (stomach ache, gut cramps)	61	29	1	41	0.5	*Citrus aurantifolia* (Christm.)Swingle	26%
						-	11%
oho (coughs)	55	22	9	60	0.8	*Rhynchophorus spp.* larvae	44%
						Citrus aurantifolia	36%
wenamaje(cold, flu)	51	21	4	41	0.6	*Citrus aurantifolia*	41%
						Siparuna bifida (Poepp. & Endl.) A.DC	8%
chihi (skin sores)	50	35	-	28	0.3	*Copaifera paupera*	10%
						Jatropha gossypiifolia L.	10%
kono (intesitnal worms)	50	5	-	38	0.9	*Ficus insipida* Willd.	39%
						Chenopodium ambrosioides L.	39%
ebakwa kwaya kwahiji (birth aide)	49	12	7	17	0.6	mandible of *Agouti paca*	16%
						-	14%
						-	7%

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Table 9.1.--- Continued *Ese Eja major medicinal activity contexts species.*

ACTIVITY CONTEXT	NO. OF REPORTS.	PLANTS	OTHERS	RESPONSE RATE (%)	IAR	MOST WIDELY REPORTED MEDICINAL	
bakwama'epoji (contraceptive)	46	7	-	39	0.9	*indet.*	73%
						Genipa americana L.	10%
(panacea)	46	33	1	20	0.3	-	22%
						Urera carcasana (Jacq.)Gaud. ex Griseb.	10%
boho (abcess, infected sores and wounds)	43	22	-	18	0.5	*Mansoa alliacea* (Lam.) A. H. Gentry	7%
						-	7%
shaja nee (earache)	43	8	9	37	0.8	*smoke (burnt rubber)*	44%
						Citrus aurantifolia	31%
shejee (blows, sprains, swellings)	37	22	3	18	0.5	*Piper peltatum*	14%
						Talinium paniculatum (Jacq.)Gaertn.	14%
sapa-nee (head-ache)	37	8	2	33	0.8	*Kalanchoe pinnata* (Lam.) Pers.	14%
						Citrus aurantifolia	22%
enakwaeki (menstrual/ post-partum hemorrhaging)	37	18	-	34	0.5	-	11%
						-.	8%
eyami-nee (body aches, aching joints)	33	25	3	14	0.2	*Ficus caballina* Standl.	15%
						-	9%
ana si' (thrush, mouth ulcers)	23	8	3	14	0.5	*Jatropha curcas* L.	35%
						Jatropha gossypiifolia L.	30%

Note: A hyphen in the "Most Widely Reported Medicinal" column indicates that the species identity cannot be revealed, according to the protocols listed in chapter 1 for the protection of Ese Eja intellectual property rights.

In contrast, only 20% of those interviewed identified a treatment for ***shaja-nee*** (ear ache), and those that did, identified an average of 1 and a maximum of 2 treatments for this activity context.

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All of the most salient activity contexts relate to symptoms of gastrointestinal, respiratory and skin infections. Not surprisingly, these are the most important health problems among the Ese Eja (New Tribes Mission, n.d; Peluso, unpublished data), as well as in the region (Cueva, 1990; Eichenberger, 1966; Grupo DAM, 1978; Hewett and Duggan, 1986; Pollock, 1988; Soto, 1980; Strongin, 1982; Temple, 1978), and throughout the tropics (Bodeker and Hughes, 1998; Etkin and Ross, 1982; Logan, 1973)

When all activity contexts are grouped under broader cosmopolitan categories, according to the symptoms treated[5] (Table 9.2), the correlation between salience of activity contexts and actual patterns of illness is confirmed and highlighted: close to half of all reports relating to symptoms of gastrointestinal, skin and respiratory infections[6].

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5. Clearly, these broader categories do not necessarily have Ese Eja equivalents, though in some cases they actually do. That is, while the Ese Eja have categories that include the symptoms such as diarrhea, stomach cramps and indigestion, vomiting and intestinal worms, they do not necessarily group these under the larger taxonomic category of "gastrointestinal disorders". Having said this, a pile sort exercise among Tzeltal Maya produced a list of comprehensive groupings which strongly resembled a biomedical classification (Brett,1994). A similar exercise among the Ese Eja might conceivably produce similar results. In any event, by grouping Ese Eja medicinal resource activity contexts into a higher-level ordering based on physiological systems, I wish to examine medicinal resource knowledge with respect to actual patterns of morbidity and mortality.

6. Because most episodes of fever, here tallied under a separate category, are in fact associated with respiratory infections, the latter category is probably under-represented in this tabulation. Adding the fever reports to the other reports associated with respiratory infections brings this category to second place, and in direct accordance to estimates of mortality.

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The ranking of activity context categories in table 9.2 roughly coincides with those reported for other groups, including: Huastec (Mexico; Alcorn 1982:600), Tzeltal (Mexico; Brett, 1994:83), Highland Maya (Mexico; Berlin and Berlin, 1994: 250), Chácobo (Bolivia; Boom, 1987), Miraña (Colombia; La Rotta et al., 1987), Tiriyó (Brazil; Cavalcante and Friekel, 1973), Yanomami (Brazil; Milliken and Albert, 1996), Caboclos (Brazil; Amorozo and Gély, 1988), and others (e.g. Johnston and Colquhoun, 1996 for Guyana; Johns et al., 1994 for the Batemi, Tanzania).

Table 9.2. *Symptoms and Physiological Systems Treated by Ese Eja Medicinals.*

activity context	NUMBER OF REPORTS				
	PLANT	ANIMAL	OTHER	TOTAL	%
GASTROINTESTINAL	367	4	7	378	22%
SKIN INFECTIONS	214	19	12	245	14%
TRAUMAS AND BODY ACHES	164	5	4	173	10%
REPRODUCTIVE	146	22	-	168	10%
RESPIRATORY INFECTIONS	121	47	10	178	10%
FEVER	117	2	1	120	7%
EYES, EARS	82	16	25	123	7%
TEETH	88	3	-	91	5%
ANIMAL BITES	49	2	-	51	3%
CHILD-CARE	46	-	-	46	3%
PANACEAS	45	1	-	46	3%
MISCELLANEOUS	116	8	3	127	7%
TOTAL	***1555***	***129***	***62***	***1746***	-

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While gastrointestinal disorders are the most important sources of adult morbidity among some Amazonians (e.g. Behrens, 1984; Viale, 1982), acute respiratory infections[7] acquire a primary role in others (e.g. Strongin, 1982). Among the Ese Eja, gastro-intestinal disorders are generally more prevalent than respiratory infections, but their impact is not as acute. Whereas respiratory infections occur only sporadically, and mostly during the dry season, they often reach epidemic levels, and as a result are far more disruptive to community life.

The relative importance of gastro-intestinal and respiratory infections may also vary according to age. The are often the most important source of infant mortality (1-12 months old). Lower respiratory tract infection mortality is particularly high among infants in developing countries (Nichter, 1994). Weaning results in greater exposure to orally ingested pathogens, so that gastrointestinal disorders become the principal source of child (1-4 years) mortality (Eichenberger, 1966). Hence, the relevance or significance of activity contexts is likely not to be uniform, but to vary and change seasonally as well as during different stages of child development.

---

7. Acute Respiratory Infection is a general label that encompasses both upper (URI) and lower respiratory tract infections (ALRI). Upper respiratory tract infections include coughs, colds and croup, often caused by rhinoviruses, influenza viruses, and respiratory syncytial viruses. In contrast, most cases of ALRI result from pneumonia, caused by a bacteria (Nichter, 1994).

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Table 9.3 summarizes the activity contexts for a sample involving 66 direct observations of medicinal use in Sonene. Although the sample is small and biased toward households and events that could be observed regularly and informally, it supports the notion that the most salient activity contexts, ***kiyo*** and ***see-see,*** are also those most frequently associated with medicinal use.

The salience of other activity contexts however, cannot be explained solely based on the frequency with which plants are used. For example, though medicinal resources related to reproduction, including fertility agents, contraceptives and birth aides, were frequently reported, other interview data and case histories reveal that such resources are in fact not frequently used (Peluso,unpublished data).

Table 9.3 *Activity contexts for 66 observed medicinal use events.*

Activity Context	**Events Observed**
kiyo (fever)	19 (29%)
see-see diarrhea)	15 (23%)
eshakwiji (panacea)	11 (17%)
chihi (skin sores)	5 (8%)
bowii (vomiting)	4 (6%)
oho (coughs)	4 (6%)
others	8 (12%)
Total	***66***

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One possibility is that these activity contexts are salient not because of the frequency with which they become relevant, but because of the meaning attached to them when they do occur. Thus, even though most births are uneventful, complications do arise occasionally, and these can easily become life-threatening. Likewise, although infertility is uncommon, the possibility of not being able to procreate has serious cultural, emotional and economic implications for the Ese Eja. Hence, most people are acquainted to some degree with measures to manipulate fertility, even if they have had or will never have direct experience of these.

Likewise, bites from poisonous snakes (including the bushmaster, *Lachesis muta* L., and the lanceheads *Bothrops spp. Crotalus sp.*) or sting rays stings (*Potamotrygon*) are extremely rare in the region (but cf. Larrick et al., 1979; Lowell, 1994:273): in 12 years I have never directly witnessed an instance of either, and a very small percentage of adults claim to have experienced an attack. The fear of snake-bite in particular however, is quite marked, and people will frequently caution each other to be careful when walking in the forest or collecting Brazil nuts. As such, these categories occupy a more important presence in the ethnomedical repertoire of the Ese Eja than might be expected based on patterns of actual experience.

Salience of activity contexts then, reflects the frequency with which certain behavioral responses occur, as well intensity as of experience of the associated

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response. Skin ailments including rashes, parasitic, fungal and bacterial infections are very common but rarely incapacitating. I have already discussed how episodes of acute respiratory infections are sporadic, but when they do occur, they affect a greater proportion of the population, in ways which are highly disruptive to community life. Though both score similarly in their salience values, their salience responds to different aspects of their roles in medical thought and behavior.

In sum, salience of activity contexts is related to morbidity, mortality, and to the frequency and intensity of the experience associated with the symptoms treated. The role and relationship between each of these factors is not fixed, but seems to vary contextually, according to the time of the year, age, and perhaps also individually. Moreover, in many instances, salience does not seem to reflect patterns of actual use since many illness episodes are not treated.

Salience of medicinal resources

The two most frequently reported medicinals for each activity context are listed in table 9.1. Percentage figures next to each species or substance (last column) indicates the proportion of the total reports for that activity context (second column) that is attributed to that specific resource. For example, 18% of the 246 reports of treatments for diarrhea, involved the use of *Psidium guajava*. Because species were only tallied once for each treatment category

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per informant, the figure can also be read as the percentage of the informants who reported the species. As such, it provides a rough measure of consensus or salience of the species as a medicinal.

Table 9.1 also lists the IAR (Informant Agreement Ratio, *sensu* Trotter and Logan. 1986) values for each activity context. One way to interpret this data would be to, as Trotter and Logan did, posit that medicinal resources associated with high IAR values are more likely to be bioactive or pharmacologically effective. Another way of employing IAR values, more pertinent to this discussion, is to regard the index as a measure of salience of the principal medicinal resources associated with each activity context. These results indicate that salience, both in terms of IAR values and the primacy of some species in relation to others, is quite variable for different medicinals and activity contexts. Before exploring the significance of some of this variation, I will review the taxonomic and ecological characteristics of the most salient medicinals.

Table 9.6 lists the most salient Ese Eja medicinals (reported over 20 times), in terms of the total number of times they were reported, and the number of times they were reported for a single activity context. Of the 14 plants, 5 are cultivated, and 6 are very accessible due to their abundance and/or location in disturbed and managed environments. Only 3 of the 14 medicinals are either

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rare or require a considerable investment of time to collect or process. Only one animal species was reported over 20 times.

Table 9.6. *Most important medicinal resources in terms of number of times reported (salience) within a single category.*

MEDICINAL	CHARACTERISTICS	MOST WIDELY REPORTED CATEGORY	NO. REPORTS IN CATEGORY	TOTAL REPORTS
Citrus aurantifolia (Christm.) Swingle	Cultivated	***sapa nee*** (headache)	30	148
Maclura tinctoria (L.) Steudel	Relatively Common	***se'nee*** (tooth ache)	52	52
Carica papaya L.	Cultivated	***kono*** (gut parasites)	20	50
Triplaris americana L.	Common	***see-see*** (diarrhea)	37	44
Psidium guajava L.	Cultivated	***see-see*** (diarrhea)	44	44
Piper peltatum L.	Very Common	***koja wo'o*** (eye irritation, conjuncti-vitis)	26	41
Persea americana	Cultivated	***see-see*** (diarrhea)	33	39
-	Common	*eshe* (scabies)	30	36
-	Rare	contraceptive	34	35
Rhynchophorus spp. larvae	Relatively Common	***oho*** (coughs)	24	30
Salix humoldtiana Willd.	Common	***see-see*** (diarrhea)	22	33
-	Uncommon	(sleeping)	28	31
Ficus insipida Willd.	Common	***kono*** (gut parasites)	20	29
Copaifera paupera Ducke	Rare	***eshe*** (scabies)	25	25
Vitex sp. 1	Cultivated	***see-see*** (diarrhea)	22	23

Note: *A hyphen in the column "Medicinal" indicates that the species identity is not being disclosed in order to protect Ese Eja intellectual property rights, and according to the protocols discussed in chapter 1.*

The tendency for salience to be correlated with ecological abundance is well-known (e.g. Turner, 1988), and several authors have reported similar findings in

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Amazonia (e.g. Amorozo and Gély, 1988; Branch and Silva, 1983). Indeed, a number of approaches to evaluate medicinals (e.g. Johns et al., 1990; Moerman, 1991) specifically factored out abundance of plant taxa, in order to determine the extent to which plants are selected specifically for their pharmacological properties.

Abundance of medicinals may influence salience in at least three ways. First, abundance or commonness tends to increase the cognitive salience of any object. Secondly, and as we will see below, accessibility is a primary consideration when selecting between different treatment options, at least during the early stages of an illness episode. Third, people are more likely to be acquainted with common plants, particularly if they spend time interacting with them in other contexts, as this increases the opportunities and mechanisms for experimentation.

Interpreting Salience of Medicinals

Table 9.1 indicates there is considerable range in the salience of medicinals. Whereas treatments for ailments seem to be clearly dominated by one or two species, the distribution of reports in other treatments is scattered over a number of species. Table 9.7 and the accompanying figure (figure 9.1), compare the distribution frequencies of reports for the 13 and 35 medicinals reported for ***koja wo'o*** (cf. conjunctivitis) and ***chihi*** (cf. skin sores), respectively.

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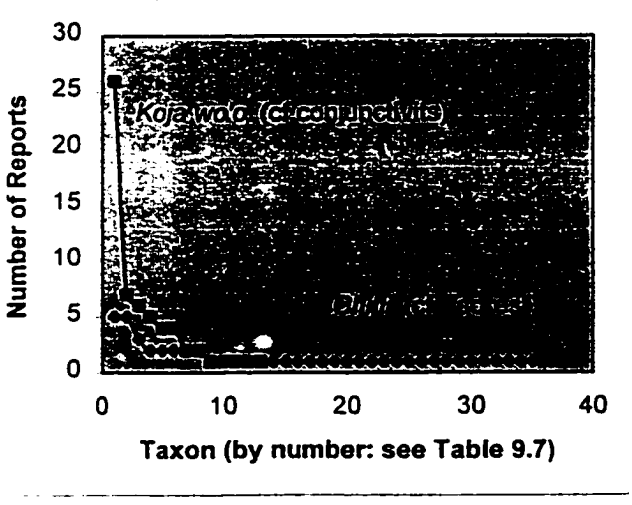
Table 9.7 *Distribution of medicinal reports for the activity contexts chihi and koja wo'o*

TAXON ID	*CHIHI* ("SORES")		*KOJA WO'O* (CONJUNCTIVITIS)	
	SPECIES	R	SPECIES	R
1	*Copaifera paupera* (Herzog) Dwyer	5	*Piper peltatum* L.	26
2	*Iryanthera juruensis* Warb.	5	*Bixa orellana* L.	7
3	*Jatropha gossypiifolia* L.	3	*Martinella obovata* (H.B.K.)Schuman	6
4	*J. curcas* L	2	*Citrus aurantifolia* (Christm.)Swingle	5
5	*Croton sp.*	2	-	4
6	*Chenopodium ambrosioides* L.	2	*indet. Poaceae*	4
7	*Piper hispidum* Sw..	2	-	2
8	*Otoba parvifolia* (Mgf.)A.H.Gentry	2	*Vernonia patens* H.B.K.	2
9ff	9-35: All other spp.	1	9-13: All other spp.	1
Total Reports	-	**51**	-	**61**

Note: *A hyphen in the column "Species"" indicates that the species identity is not being disclosed in order to protect Ese Eja intellectual property rights, according to the protocols discussed in chapter 2. R=Number of Reports.*

Figure 9.1 *Distribution frequencies of medicinal reports for two Ese Eja activity contexts,* ***chihi*** *(cf. sores) and* ***koja wo'o*** *(cf. conjunctivitis).*



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While in the former case 57% of 61 reports refer to a single species, *Piper peltatum*, in the latter case no one medicinal accounts for more than 10% of the 50 reports.

Direct observation of medicinal use suggests that, as in the case of activity contexts, high salience may be associated with frequency of use, but there are many exceptions. Based on discussion with the Ese Eja and direct observations, I identify at least four factors associated with salience: frequency of use, perceptions of efficacy, characteristics of the activity context or symptoms treated and the influence of external perceptions. I will now discuss each of these separately, illustrating their roles through the use of specific examples.

There are two aspects of medicinals which individuals take into account when selecting specific treatments among several options: accessibility and efficacy. As I discussed in the previous chapter, choices are usually made in ways that minimize the investment of time and energy in effecting a cure. Within the range of options available, the most accessible treatment will usually be chosen first, even if it is not considered the most efficacious or "powerful". Thus, most episodes of diarrhea are first treated with *Psidium guajava* or *Persea*

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americana In both cases the plants are common, accessible, and easily harvested. *Vitex* sp. is considered to have greater efficacy, yet is usually only used if the first treatments fail. Though *Vitex* may also cultivated, it is not as common, and its preparation is somewhat more time-consuming as it requires stripping the bark off, scraping the outer layers and crushing or grating the inner part. Many informants consider *Triplaris americana* to be the most efficacious, yet the species is only rarely used, and then as a last resort. As a wild species, *Triplaris* is less accessible than plants found in home gardens. Moreover, it is also inhabited by extremely aggressive *Pseudomyrmex* ants whose painful bite is most discouraging to those seeking to harvest bark. *Psidium* and *Triplaris*, illustrate two different aspects of salience or importance. The former is valuable in that it is an accessible, frequently used and generally effective treatment, the latter in that it is the most effective. Thus, even though *Triplaris* is rarely used, it is reported nearly as frequently, and thus appears to be as salient, as *Psidium*.

Many other examples of the interplay between accessibility and efficacy can be found in the data set. The oil extracted from the larvae of palm Bruchids is extremely valued as a remedy against coughs, yet rarely utilized since its time-consuming preparation makes it rather inaccessible and limited to serious episodes. Species, such as *Citrus aurantifolia* and *Maclura tinctoria*, which are both accessible and highly regarded for their efficacy, tend to be the most salient.

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Benz et al. (1994) note that among communities in the Sierra de Manantlan Biosphere Reserve in Mexico, "use of the plant resources...appear to be a function of relative taxonomic abundance of the area's flora", and that "floristically common plant families are represented by a greater number of species listed as useful" (ibid:34). At the same time, there is clear evidence that selection of plant resources is not random, but that certain taxonomic groups are systematically selected (e.g. Moerman, 1991). Based on my observations, I suggest medicinal use is indeed selective and informed by efficacy, but that abundance and accessibility are key determining factor in shaping selection criteria, particularly early on in the treatment process.

The characteristics of activity contexts themselves may influence salience in a number of ways. Earlier, I suggested that the salience of activity contexts is related to both the frequency and the intensity with which illnesses or symptoms are experienced. Symptoms not perceived as threatening or disabling, even if they are prevalent, are frequently not treated. Thus, in a number of cases, both activity contexts and the medicinals are salient because they are associated with prevalent conditions, even if these are frequently left untreated. That is, in a number of cases, salience does not reflect actual frequency of use, though in others it does. For example, many instances of ***koja wo'o*** (eye irritation, including conjunctivitis) and perhaps surprisingly, ***oho*** (coughs), are not treated unless these persist for some time or become increasingly aggravated. Hence, the high salience of these activity contexts and their associated medicinals

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(table 9.1) is not correlated to high frequencies of use, even though the conditions are prevalent.

The characteristics of activity contexts may also influence IAR values and salience. Ese Eja medicinal use categories, are taxonomic categories insofar as they group a diversity of observable phenomena, physical symptoms, into discreet units. It appears that some of these categories group a broader range of symptoms than others. Earaches for example, are almost invariably due to inflammation of the middle or inner ear, and intestinal worms are easily and specifically diagnosed through visual examination of the feces. Activity contexts such as "colds", "body aches" and "birth aides" on the other hand, encompass a wide range of symptoms, pathologies or physiological systems. One might expect activity contexts characterized by a narrow range of well-defined symptoms to be associated with tighter clusters of medicinal agents than those covering a larger number or range of pathologies or symptoms.

This may explain why the highest consensus-based salience ratios are scored by activity contexts that include narrow and well defined range of symptoms. ***Chihi*** , characterized by a low IAR index (0.3) and wide scatter of medicinals (50 reports representing 35 medicinals, see fig. 9.1) is a good example of an activity context which includes several biomedical conditions, including bacterial, viral and fungal infections. In contrast, ***koja wo'o*** refers almost always to conjunctivitis and thus has a more specific medical etiology than

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chihi. Likewise, and in contrast to ***chihi***, ***koja wo'o*** is characterized by a high IAR index and overall consensus in the use of *Piper peltatum* as a treatment.

There is another aspect to activity contexts as taxonomic categories that may influence observed patterns of salience. It is very likely that some of these categories are further subdivided by the Ese Eja. For example, ***chihi*** is also used to describe measles and hives, though these types of ***chihi*** are considered distinct and separate in so far as use of medicinal resources is concerned. I suspect that ***chihi***, and possibly some of the other activity contexts, are further categorized by the Ese Eja, either explicitly, or as covert categories (Berlin et al., 1968). Hence, a more detailed analysis of the medicinal resource behavior and perceptions associated with ***chihi*** and other activity contexts may well find higher rates of consensus in the choice of medicinal resources than is suggested by my data set[8].

Salience of medicinal resources and activity contexts may also mirror and be influenced by external perceptions, in ways that do not correlate to actual patterns of use. The case of ***kono***, intestinal parasites, provides a good example. According to the survey data, close to 40% of informants identified at least one medicinal in the treatment ***kono***, with an overall high agreement on the use of *Ficus insipida* and *Carica papaya* (IAR 0.9; Table 9.8). The salience

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8. Indeed, one of the weakness of my methodology was to omit conducting a more systematic ethnotaxonomic evaluation of activity context categories. Hence, though I elicited and compiled an extensive set of ailment categories, I do not have a precise understanding of their taxonomic relationship.

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of *Ficus insipida* in these reports is misleading however. Practically all informants who reported *Ficus insipida* as a treatment for ***kono*** stated they had never actually used it and was reluctant to do so for the reasons discussed earlier; namely that its ***eshawa*** is feared.

Table 9.8. *Ese Eja reportings of plant antihelminthics.*

SPECIES	NUMBER OF REPORTS	
	Peru	Bolivia
Ficus insipida	11 (41%)	9 (40%)
Chenopodium ambrosioides	8 (30%)	-
Carica papaya	7 (26%)	13 (60%)
-	1 (4%)	-
Total	**27**	**22**

Note: *A hyphen in the column "SPECIES" indicates that the species identity is not being disclosed in order to protect Ese Eja intellectual property rights, according to the protocols discussed in chapter 2.*

Furthermore, actual observations and accounts of informants suggest that the Ese Eja do not generally consider ***kono*** to be a health hazard, except at very high rates of infestation. These in turn are evidenced by such symptoms as coughing up parasites, lack of appetite, and general weakness and anemia, become apparent. Even cases of apparent high parasitic infestation are often not treated, in contrast to other activity contexts such as ***koja wo'o***, which scored similar figures for rates of response and degree of consensus.

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I suspect that the cognitive salience of ***kono*** as an activity context, and of *Ficus insipida* as a medicinal resource, is related to importance given to these by ***deja***, including government health workers, primary health care projects, and surrounding Ribereños. Antihelminthic campaigns have been vigorously and repeatedly encouraged in indigenous communities, as have other concepts relating to health care, following World Health Organization recommendations for primary health care (SIL, 1966; WHO, 1984).

One health care project I was actively involved with in Madre de Dios, directed considerable resources to promoting the use of *Ficus insipida* as a herbal antihelminthic (Alexiades and Lacaze, 1995)[9]. In addition, "ojé" or ***etona***, is also a rather widely known and utilized antihelminthic among surrounding Ribereño and indigenous populations in Peru and Bolivia, and hence the Ese Eja readily associate it as a ***deja*** medicinal. Finally, the latex from the tree is also occasionally harvested and sold to ***deja***, mainly river merchants, hence adding to its salience as a ***deja***-related resource.

The above examples illustrate how medicinal resources can acquire perceptual salience not through their direct value as medical resources, but as symbols of identity and by extension of contact with other social actors. Indeed medicinal

9. Considering that the informant sample size is smaller for Peru than Bolivia, it is possible that the proportionally larger number of reports for kono as a whole in the former is due to the fact that primary health care projects incentivating the use of anthelminthics have been stronger here and/or my association with this project and hence these resources in Peru. Hence these data raise the question of informant reactivity, a topic I deal with more extensively in chapter 2.

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plants are not simply resources in the sense that they are used to address specific biological needs, but are also symbolic and political resources which individuals use and manipulate to position themselves within broader social and economic contexts (Crandon-Malamud, 1991).

The link between health and development and the widespread presence of state-related health care delivery systems has led to a kind of globalization of many cultural models of health. These models are incorporated and manipulated in different ways, and have had a large effect on indigenous perceptions, representations and utilization of medicinal resources, and on health-related practices in general. In this respect, the cultural model of primary health so pervasive in rural communities, may have contributed to add salience to ***see-see*** (diarrhea) as well.

Selection of medicinal resources is therefore highly contextual in that it involves the interplay of several factors, which include: severity of the ailment, age or state of the patient, number of options available, individual perceptions of efficacy, and the relative abundance or ease of preparation of the treatment. All of these factors influence to varying degrees the reports of medicinal resource use and verbal salience. Thus, the assumption that frequency of response, that is verbal or cognitive salience, is automatically correlated to intensity of use (e.g. Benz et. al, 1994:28) needs to be qualified.

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Number of uses and importance of medicinal resources

Until now, I have evaluated the use of consensus in estimating "importance" of medicinals. Another approach entails tallying the number of activity contexts associated with each species. This approach has been adopted by a number of authors to rank the overall "importance" of plants as resources. More than "importance" however, such figures may provide a sense of the "breadth" of use associated with particular plant species.

Only 5 of the 210 plants, and none of the other medicinal substances, are associated with three or more medicinal activity contexts (table 9.9)[11]. Of these, *Citrus aurantifolia*, *Copaifera paupera* and *Piper peltatum*, are also associated with high IAR and hence high consensus-derived salience. Although *Jatropha gossypiifolia* is associated with low IAR ratios, in one activity context, ***ana si'*** (cf. thrush), close to 70% of reports involved *J.gossypiifolia* or the closely related species *J. curcas*. Aside from *Carica papaya* then, the most important medicinal resources in terms of the number of activity contexts or "breadth", are also the most salient.

The converse however, is not true. That is, evaluating species on the basis of the number of activity contexts they are associated with, omits salient and by a

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number of different criteria, important resources. In this case study for example, *Psidium guajava*, *Triplaris americana*, *Maclura tinctoria*, the larvae of Bruchid beetles and smoke from burnt rubber are all highly salient and valued medicinals, yet are only associated with one activity context. Thus, tallying the "number" of uses does not seem to be as effective as deriving consensus-based indices in order to rank plant resources, at least for medicinals.

Table 9.9. *Number of medicinal uses for common Ese Eja medicinals*

Species	Medicinal Activity Contexts	TOTAL
Citrus aurantifolia	colds, coughs, headaches, fever, stomach aches, vomiting diarrhea, ear aches, burns, vaginal discharges	10
Jatropha gossypiifolia	fever, skin sores, cuts, fungal infections, thrush	6
Carica papaya	parasites, -, -, ear ache, -	5
Copaifera paupera	cuts, sores, fungal infections, scabies	5
Piper peltatum	swellings/sprains, somnifacient for children, conjunctivitis	3

Note: *A hyphen in the column "Medicinal Activity Contexts"" indicates that the activity context is for that species is not being revealed in order to protect Ese Eja intellectual property rights, according to the protocols discussed in chapter 2.*

Elicitation techniques, salience and quantitative evaluation of cultural significance

While many ethnobotanical studies, particularly quantitative ones, use plant resources to elicit activity contexts (e.g. Phillips and Gentry, 1993a,b), I used activity contexts to elicit plant resources. Ideally, both approaches should allow

11. A number of activity contexts are closely interrelated. Hence the five activity contexts listed for Copaifera, for example, are all associated with skin ailments.

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one to identify salient medicinal resources. That is, when asked to provide information about *Psidium*, a large proportion of respondents should indicate its use to treat ***see-see*** (diarrhea), just as *Psidium* was widely reported as a treatment of diarrhea in my study.

In practice however, choosing an elicitation frame of reference determines the boundaries of the universe of responses. Put in a different way, using plant species to elicit information on activity contexts will restrict sampling to a small portion of the existing range of plant species surrounding any tropical village: clearly, one cannot realistically ask about every single plant in an area of considerable plant diversity. In most cases, researchers choose a sample of the vegetation, often a hectare of forest, and use that as the sampling universe (e.g. Alexiades, in preparation; Boom, 1987). The criteria used to select the vegetation unit or the sample of plants included in the survey place strong, potentially subjective, constraints on the data obtained. While data elicited in this manner may offer valuable insights as to how that particular vegetation is viewed, it says very little about the relative significance or importance of the sampled plants with regard to actual human needs, perceptions and behavior in question. One partial solution to this problem is to select a sample of plants representing a range of environments and the diversity of available resources (e.g. Alcorn, 1982).

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As I showed earlier, most frequently employed and salient Ese Eja medicinals are either cultivated or found in highly managed environments (see also, Kohn, 1992). In addition, many cultivated medicinals are exotic species introduced in recent times. Plant-based inventories that do not take into account such vegetation systems will present distorted accounts relating to the characteristics of medicinal resource perception and utilization. Table 9.10 summarizes the results of an ethnobotanical survey conducted with two Ese Eja informants in a one hectare plot of mature forest in the Ese Eja community of Infierno (Alexiades, 1990)

Results from this, admittedly small, sample give a very different impression of medicinal resource perception among the Ese Eja. When activity contexts from the plot inventory are ranked according to their salience (Table 9.11), the order is nearly reversed with respect to the ranking developed from the broader survey, the only exception being skin problems, which rank in second place in both data sets. Gastrointestinal and respiratory ailments, whose salience has already been highlighted, barely appear in the data set elicited through a forest inventory. Furthermore, only 2 of the 20 species identified in the forest inventory as having medicinal activity contexts scored high salience as medicinal resources in the ethnomedical survey .

Hence, while the forest inventory supplies interesting data concerning Ese Eja perception of this particular vegetation zone, the data provides very little insight

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on the overall contribution of plants to health, or on the cultural significance of different species. Clearly, using activity contexts to elicit information also restricts the data to a few categories.

Table 9.10. *Medicinal resources inventoried in a one-hectare plot of mature forest, Tambopata, Madre de Dios.*

ACTIVITY CONTEXT	TOTAL SPP	SPECIES INCLUDED
panaceas/ child Care	4	*Urera caracasana* (Jacq.) Gaudich. ex Griseb., *Combretum laxum* Jacq., ----., ---
Fever	3	*Urera caracasana*, ---- ----
snake and insect bites	3	----
sores, cuts	2	*Otoba parvifolia* (Mgf.) A. H. Gentry, ----
blows and swellings	2	----
diarrhea	2	*Triplaris americana* L, *T. poeppigiana* Wedd.
abscesses	1	----
fungal infections	1	*Socratea exorrhiza* (Mart.)Wendl.
scabies	1	----
body aches	1	*Protium fimbriatum* Swart
coughs	1	----
fertility agent (female)	1	----
charms	2	---*Tynanthus schumannianus* (O.Ktze) A. H.Gentry
others	9	

In this case however, the categories are much broader (an activity context in contrast to a species). Moreover, it is much easier to include an almost complete sample of activity context categories than it is to cover a representative sample of the botanical universe of any tropical community. Plant-based evaluations of cultural significance therefore, are valuable in determining the perceptions and valuations of particular vegetation zones or species configurations, but will not yield reliable insights as to the differential role of plant resources in human activities.

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Table 9.11. *Ranking of Ese Eja medicinals according to plant-based and activity context-based criteria.*

SYMPTOMS TREATED	RANK: ACTIVITY CONTEXT BASED INVENTORY	RANK: FOREST INVENTORY
Gastrointestinal	1	6
Skin infections	2	2
Colds, etc	3	7
Blows, etc	4	5
Reproductive	5	7
Eyes, ears	7	0
Fever	8	5
Teeth	9	0
Animal bites	10	5
Child care/ panaceas	11	3
Miscellaneous	6	1
Charms	NA	6

Rather, such indices yield a measure of potential value, and as such may be useful in locating promising species, evaluating the economic potential and developing management plans for specific vegetation zones (e.g. Ibarra-Manríquez et al., 1997; Phillips et al., 1994; Prance et al.,1987).

Salience and medicinal resources: concluding remarks

The cognitive salience of activity contexts and medicinals, as evidenced by the relative frequency with which they are reported by a sample of informants, is

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by a broad range of factors and processes, which in turn relate to the role of medicinals as pharmacodynamic, ecological and symbolic objects.

While accessibility and efficacy appear to be the two most important factors contributing to salience, there are other important factors influencing salience of medicinals. Perceptually unique resources, either due of their appearance or the meaning attached to them, may become more salient, independently of how frequently they are used or how they are perceived in terms of efficacy. Because plants also constitute symbolic resources, used to express and articulate social relations, salience may at times reflect social and political, and not merely medical or ecological, processes.

Some of these factors have been recognized in formal attempts to evaluate the cultural significance of different plant resources. Turner (1988) for example, recognizes ecological salience (ie. abundance and distribution), perceptual salience and potential utility as contributing measures to cultural significance. While recognizing the presence of different variables and processes is not too difficult, determining their relative significance and contribution to formal evaluations of "importance" is much more complicated. In order to calculate an index of "cultural significance", Turner (ibid.) is forced to make quantitative yet subjective estimations of the quality, intensity and exclusivity of "uses".

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Though consensus provides an effective way of estimating salience, salience itself can be a function of a broad range of processes and factors, many of which vary circumstantially. Precise rankings of medicinals may thus necessitate clear demarcation of what aspect of "importance" is to be evaluated. A ranking of Ese Eja medicinals according to their frequency of use, and hence their contribution to health, or according to their perceived efficacy or their "breadth" of use, produce different results and illustrate different aspects of the role of medicinals as resources.

Because the significance of plant resources reflects actual needs and behavior, it would seem that the tools and techniques of behavioral anthropology have much to offer in operationalizing human-plant relations. Hence Turners "intensity" of use, as "the impact of a plant on the day-to-day lives of people within a culture" (ibid: 278) might be more precisely operationalized through the use of a behavioral model. Here, the specific contribution of a plant resource to the health or nutrition of a human group, is defined on the basis of frequency of use, nutritional content or pharmacological effect, and/or by the time-energy investment associated with it (Zent, 1996).

Such "etic" approaches have been quite effectively been used to assess and determine human-plant interactions in the context of dietary habits, foraging behavior and agriculture (e.g.Johnson,1983), but to my knowledge have not been applied in the context of medicinal resource use. One foreseeable

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problem among the Ese Eja would be the degree of intrusiveness and reactivity that such approaches would likely entail. Certainly in my own experience, this methodological problem curtailed the degree to which I was able to develop structured data-collection procedures.

Efforts to evaluate the role of natural resources for different human needs are more likely to be effectively addressed by elicitation procedures employing key activity contexts. In these cases however, great caution needs to be exercised to ensure that the activity contexts used correspond to locally employed and understood categories. In general, and particularly when time or understanding of emic categories is limited, the use of open-ended elicitation of ethnobotanical information may be more recommendable.

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Chapter 10.

Intra-Cultural Variation and Medicinal Resources

Introduction

Generalized statements concerning how the Ese Eja interact with their plant resources inevitably belie a myriad of contextual qualifications and exceptions. For example, one might correctly state that the leaves of ***so'doo*** (*Siparuna* spp., Monimiaceae) are used by the Ese Eja in baths, to treat colds and fevers. In actuality however, not all Ese Eja bathe their children in ***so'doo*** when they have fever. Indeed, some are not familiar with the plant, while others are familiar with the plant but are not aware of its use to treat fever. Still others are aware of its value, but claim to have never used it, either because they question its efficacy or because the plant is not currently found among the available repertoire of botanical resources. Some might claim to be unaware of the plant's properties, when in actuality they are, and others may claim disregard for the plant while in practice they do use it. Finally, of those claiming to have used it, some might use it very frequently, others only occasionally, and some used it years ago, before the arrival of the medically-trained health worker.

The above example illustrates the diversity and complexity characteristic of much of human and ethnobotanical thought and behavior, particularly in relation to

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medicinals. The degree to which knowledge is shared varies between semantic domains and societies (Werner and Schoepfle, 1987). Intra-cultural variation seems to characterize much ethnobotanical knowledge: idiosyncratic knowledge accounts for as much of half of ethnobotanical knowledge recorded by some (e.g. Benz et al., Johns et al., 1990). In these cases, personal experimentation has been signaled as a potentially important explanation for high rates of intra-cultural variation.

Anthropologists have noted that a certain amount of variation is due to informant errors (e.g. Cancian, 1963), or result from the data-gathering process (e.g.Foster, 1979). Ultimately however, much intra-cultural variation is patterned according to differences in individual experience, and access to knowledge (Berlin, 1992; Hays, 1974). These in turn are determined by age, gender, kin relations, social roles, and degree of contact with other social actors and sources of knowledge. Boster (1986) for example, found that women are more knowledgeable than men concerning manioc (*Manihot esculenta*) varieties, since they are largely responsible for cultivating this crop. In addition, knowledge differences between women are correlated to kinship, as both plant varieties and knowledge are mainly exchanged between members of family and extended kin. Viewed in this light, many of the variations in the relationship between different Ese Eja individuals and *Siparuna* may well be re-assembled in more meaningful categories when actors are grouped according to their gender, age, residence patterns, etc.

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In this chapter, I will explore some of the processes and factors that help create differences in how individual Ese Eja perceive and utilize medicinals. In this regard, it is useful to distinguish between intra-cultural variation within the Ese Eja as an ethnic group (inter-community variation), and within Ese Eja communities (intra-community variation). Using subsets from the data set introduced in the previous chapter, I will compare the responses between two Ese Eja communities and between men and women in one community, thus addressing each level of intra-cultural variation.

Intra-cultural variation and ethnobotany

Intra-cultural variation appears to be widespread and significant aspect of ethnobotanical behavior and perceptions (e.g. Berlin 1992, Boster 1986, Brookfield and Padoch, 1994; Padoch and de Jong 1992), as well as other semantic domains (e.g. Berlin and Berlin, 1975; Furbee and Benfer, 1983; Garro, 1986; Mathews, 1983). Nevertheless, the subject has rarely been addressed systematically (but see for example, Hays, 1974 and more recently, Martin, 1996; Sillitoe, 1983:141ff). In some cases it has actually been excluded or ignored, both in terms data collecting and sampling, and in the final theoretical analysis (Posey 1992).

In other cases, variation has been assumed to be simply the result of individuals having varying degrees of knowledge in different domains, due to such factors as sex, age, social status and role, kinship affiliation, personal experience and basic

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intelligence. Anthropologists and ethnobotanists alike have frequently attempted to identify "key" informants, thought to be most knowledgeable about the particular subject in question. This assumes that the pattern of distribution of knowledge in indigenous and peasant societies follows that of technical knowledge in Western science, where 'experts' are consulted about specialized subjects. Ethnobotanists interested in medicinal plants have frequently sought healers and medical specialists as "key" informants, ignoring lay persons, who also have medical knowledge and epistemologies different from those of healers in the same community. Thus, the symptoms used to define illnesses, the etiologies used to ascribe like symptoms, and the therapeutic responses may vary considerably between healers and other community members (Etkin 1993). In a study comparing fish folk taxonomies, Boster and Johnson (1989) found that experts and novices use different criteria: while the former use both morphological and functional criteria, novices rely more exclusively on morphological, visible, features. Hence with respect to fish folk taxonomies, expert classification systems are more likely to have greater degrees of intra-cultural variation than novice ones.

At other times, knowledge is implicitly assumed to be distributed evenly, and generalizations are made based on very small samples (e.g. Reichel-Dolmatoff, 1971). In other words, relying on a limited sample of informants to construct a generalized impression of ethnobotanical knowledge, introduces a strong bias and obscures the spatial complexities of the distribution of ethnobotanical knowledge, prevalent in even the smallest of communities.

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Within ethnobotany, most of the studies relating to intra-cultural variation have focussed on plant nomenclature. One of the earliest extensive studies was conducted by Hays (1974) among the Ndumba in Papua New Guinea, suggesting that much variation is indeed patterned, and correlated to such socio-cultural variables as age, gender and kinship. Berlin (1992), has also emphasized the importance of age and sex in accounting for much internal variation.

Lexical variation is also related to the characteristics or intensity of plant-human relations. Among the Huastec for example, crop plants tend to have one well known name, whereas plants widely recognized as medicinal resources have the largest number of names (Alcorn 1982). Similarly, in a study of variation of plant names in five Tupi-Guarani languages, Balée and Moore (1991, 1994) found that names for intensely managed plants vary less and are structurally distinct from less intensely managed plants.

A number of authors have also discussed intra-cultural variation in terms of ethnobotanical behavior. Padoch and De Jong (1992) have underscored the diverse and dynamic nature of resource-use practices, even within small communities. The authors link this variability to the presence of individual subsistence strategies, designed to maximize access and use of ecological, social, economic and political resources. In a similar vein, Johnson and Baksh (1987), note significant differences in the dietary behavior and agricultural

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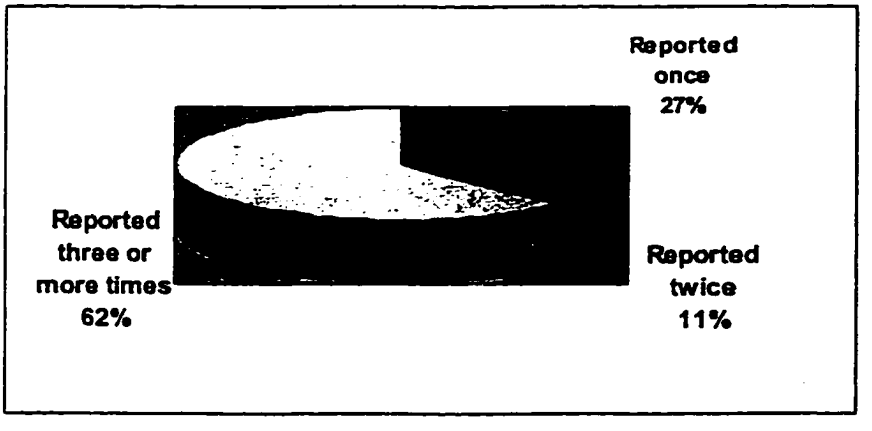
systems of two Machiguenga in Western Amazonia, accounting for these in terms of strategies used to deal with particular environmental and socio-political constraints.

Intra-cultural variation and the Ese Eja

Figure 10.1 illustrates the overall degree of intra-cultural variation, according to the data obtained from the Ese Eja medicinal survey discussed in the previous chapter. Close to 40% of 1555 reports on medicinal activity contexts were provided by only one or two informants. A large body of ethnobotanical knowledge thus appears to be idiosyncratic (cf. also,. Benz et al., 1994; Johns et al, 1990).

Figure 10.1. *Distribution of medicinal activity contexts reported once, twice and three or more times.*



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Specialist knowledge and the acquisition of medicinal knowledge

In some societies with well-established traditions in herbalism, there are socially recognized specialists in the use and prescription of medicinal resources (e.g. Brett, 1994; Kennsinger, 1974; Posey, 1994). Frequently, different practitioners are acquainted with different clusters of specialist knowledge and medicinal resources. The Shipibo-Conibo for example, have at least six different medical specialists, each associated unique domains of knowledge and therapeutic action. Of these, *raomis*, specializes in the use of medicinals alone (Cárdenas et al., 1991).

Among the Ese Eja, there appear to have been no medical specialists associated with the use of medicinals. This has begun to change in recent years, most notably through the influence of an indigenous federation health program in Peru, and through the emergence of ayahuasca shamanism (see chapter 7). As I have shown earlier, ***eyámikekwa*** shamanism is characterized by the absence or very circumscribed role of medicinals. Even though there are no herbal specialists, there is little question that some individuals are recognized as more knowledgeable than others, and at times consulted by their kin.

Knowledge of medicinal resources is learnt, either individually, through direct experimentation, or socially, through observation or verbal communication. Thus, an important question when examining the characteristics and distribution of knowledge, particularly specialist or individual knowledge, is the origin of that

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knowledge. A number of authors have shown, suggested or assumed that individual experimentation accounts for significant amounts of ethnobotanical knowledge (Milliken and Albert, 1996; Plotkin, 1986).

The role of individual experimentation, and the chemosensory and cultural mechanisms by which it is effected are discussed by Brett for the Tzeltal (Brett, 1994:147*ff.*). My own observations among five ethnic groups in southeast Peru, suggest that individual learning and experimentation is apparent in some groups and individuals, but is not universal. Not surprisingly, individual experimentation seems to be an important avenue of learning among societies with well-developed and highly organized traditions in herbalism.

During work with Shipibo-Conibo, Amahuaca and Ribereño informants, I often heard individuals discuss past or ongoing attempts to experiment with new medicinals or applications. Frequently, this learning process is culturally mediated by the use of the hallucinogenic brew ayahuasca (see chapter 7). Ayahuasca visions are not only interpreted to effect a diagnosis, but also to identify cures, frequently through the complementary prescription of specific medicinal preparations. Plants can be added as admixtures to the hallucinogenic preparation as a way to gain "knowledge" on the admixtures.

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In some ways then, ayahuasca and other "teacher plants" ("plantas maestras")[1] serve as culturally-coded mechanisms to interpret and use biological diversity. Not surprisingly, this perception and relationship with medicinal resources is shared to a greater degree by the Ese Eja who have entered contact with ayahuasca shamanism, particularly through apprenticeship with Shipibo and Ribereño shamans. Hence, among several Ese Eja in Infierno, I have noted instances of individual experimentation with plants in ways I have not observed among other Ese Eja in Sonene or Portachuelo.

How and why the use of ayahuasca is associated with increased direct experimentation of natural substances as medicinal agents is a fascinating question. One possibility is that ayahuasca and a culturally related cluster of psychoactive plants, induce heightened levels of sensory awareness, which are effectively used to identify new medicinal resources. Certainly, ayahuasca initiates report having a heightened sense of smell and awareness in relation to the location and properties of plants. Tzeltal Maya also report that insights on the specific properties of medicinal plants are brought on during "dreams" (Brett, 1994: 181). Hence, one could speculate that there might be unconscious, as well as conscious, forms of learning associated with the use of psychotropic plants.

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1. The concept of teacher plant, central to the ayahuasca shamanism practiced by Ribereños and by groups such as the Shipibo-Conibo, holds that certain plants are imbued with special powers which endow initiates with specific healing abilities or visions. Frequently, these plants are used as admixtures in the ayahuasca beverage (Arévalo, 1986; Luna, 1984, 1986).

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Aside from those individuals involved in Shipibo-Conibo or Ribereño-based ayahuasca shamanism in the community of Infierno, the Ese Eja appear to be remarkably reluctant to conduct individual experimentation with medicinal resources. Instead, they appear to rely extensively on social learning through their interaction with more knowledgeable actors. Such reluctance is not due to disinterest: indeed, the Ese Eja are almost invariably curious and eager to learn about new medicinals. As I discussed in chapter 8, new knowledge is rapidly and effectively incorporated into household-based medical behavior. However, with exception the aforementioned Infierno "ayahuasqueros", knowledge is accrued through social learning as opposed to individual experimentation.

As I have suggested, contact with ***deja***, and particularly Ribereños or other indigenous groups, is an important mechanism for the acquisition of ethnobotanical knowledge. Not surprisingly then, some of the most knowledgeable Ese Eja are those who have maintained extended contact with other social actors. This does not imply an automatic correlation between degree of contact and ethnobotanical knowledge. Ultimately, different individuals express different degrees in interest in medicinal knowledge. It is the characteristics of what are in effect personal strategies (cf. Padoch and de Jong, 1992), which determine how and to what degree individuals mobilize their social connections in order to access knowledge. In any event, some of the most knowledgeable Ese Eja are individuals with a personal stake in medicinals, as well as a past or ongoing protracted contact with ***deja***.

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Though contact with ***deja*** may be significant, it is clearly not the only source of knowledge. As I discussed earlier, there is a considerable body of knowledge diffused internally, characterized as "of the ancestors" (***etiikianaha***). This knowledge is transmitted principally among kin.

As I reiterated in chapters 8 and 9, not all types of medicinal knowledge are shared or exchanged equally. Knowledge concerning charms and plants with the reputed power to manipulate the perceptions, intents or behaviors of others, are not shared as freely or openly. Certainly, they are not discussed as openly and informally as medicinals used to treat illness symptoms. I have circumstantial evidence to indicate that this type of knowledge is thus treated more as specialist knowledge, and may be more unequally distributed than other types of ethnobotanical knowledge. Some of the men particularly, reputed as hunters or fishermen, may be referred to as "bien pusangueros", meaning that they are well acquainted with the use of the rituals and medicinals that ensure success in hunting or fishing.

Patterning of Ese Eja Intra-cultural variation

The following socio-cultural variables all help mold intra-cultural variation by affecting individual ethnobotanical behavior, and access to knowledge.

- age

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- gender
- kinship
- ancestral origins: the group or headwater tributary their ancestors were associated with (according to patrilineal descent).
- linguistic affiliation: the drainage system and dialect to which their ancestral group pertained.
- community: the river in which they currently live.

For example, a member of the ***Biaeja*** family group currently living in Palma Real is simultaneously identified as a ***na'tewe kwiñaji*** ("people of the ***na'tewe*** river", a tributary of the Heath), ***sonené kwiñaji*** ("people of the *sonene* river") and ***na'ai kwiñaji*** ("people of the *na'ai* river", the Madre de Dios). Through specific reference to placement at particular junctures in geography (rivers) and history (contact and migration down river), each of these categories represents a level at which intra-cultural variation is expressed and accounted for. Affiliation with the ***na'tewe*** group, implies a particular social history which in turn influences a number of current social and political dynamics in terms of marriage, residence, and political alliances. This is illustrated by the fact that different family groups adopt different subsistence strategies, strategies that ultimately determine how and which plant resources are used. Thus, among the Sonene Ese Eja for example, the ***Biaeja*** family group are more visibly involved in commercial Brazil nut extraction and rice agriculture than other families in the community. This investment in Brazil nuts and rice agriculture necessarily detracts from their

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investment in other resource utilization strategies, such as hunting. In contrast, the ***Kioshe*** extended family participate in brazil nut harvesting only superficially, have fairly small rice fields, yet invest considerable time in hunting and fishing.

As a ***sonené kwiñaji*** on the other hand, a ***Biaeja*** or ***Kioshe*** speaks a dialect of Ese Eja distinct from that of ***bawaja kwiñaji*** for example, the Ese Eja of the Tambopata river and its tributaries. Linguistic differences between these two Ese Eja dialects are mainly phonological, but also account for variation in nomenclature of some plants and, especially, animals.

Finally, the label of ***na'ai kwiñaji***, implies subsistence in an ecological and social environment- that of the Madre de Dios river- which differs from that of the ***bawaja kwiñaji*** on the Tambopata or the ***kwey 'ai kwiñaji*** on the Beni. Broad differences in subsistence patterns, degree of contact with markets and external agents such as development projects, missionaries and conservation units are all defined largely by an individual's geographical placement, and so account for much of ongoing variation in how Ese Eja from different communities interact with their plant resources.

Age and gender also define broad parameters of individual behavior and perceptions, both in terms of what an individual does, and the kinds of cultural knowledge s/he is exposed to. Boys, and sometimes girls, start fishing at a very early age for example, so that by the age of 8 they are quite knowledgeable on

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fish taxonomy and ecology, but much less so on other wildlife. Children are also exposed to a greater amount of cosmopolitan knowledge through schooling. Younger people tend to be more bi-cultural and have a greater involvement with markets and external agents than old people. Likewise, men and women have distinct, though at times overlapping roles, both socially and in terms of ecological relations. Men hunt, fish, gather brazil nuts, work timber, clear swiddens, and are involved in varying degrees in planting and harvesting. Women are more responsible for raising children, planting and harvesting and gathering of several forest products.

Figures 10.2 and 10.3 summarize the interaction of these different variables in facilitating inter-community and intra-community variation respectively. On the left column are the major socio-cultural variables that influence an individual's social and ecological role, and the degree and characteristics of contact with "internal" and "external" knowledge. The combination of all these factors leads to individuals developing particular subsistence strategies that are characterized by unique configuration of social, economic, ecological and political activities and relationships. These in turn influence individual ethnobotanical behavior and perception, both of which are dialectically interrelated, and associated with intra-cultural variation.

In terms of intra-cultural variation, these different socio-cultural variables operate at two distinct, though interrelated, levels of social organization. While linguistic

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affiliation and community membership are likely to characterize differences between communities and between Peruvian and Bolivian Ese Eja, age, gender and kinship affiliation are more significant in the context of intra-community variation.

Clearly, the greater the differences between the ecological or social environments of the communities in question, the greater the likelihood for significant differences in resource perception and interaction to develop. In these cases, intra-cultural variation is also associated with temporal isolation. Separation of Panare communities in Venezuela (Henley,1982, cited in Meggers, 1995) and Suya (Seeger, 1981: 229) communities in Brazil for example, has led to variations in language, ritual behavior and material culture.

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Fig. 10.2 Socio-cultural variables and inter-community variation

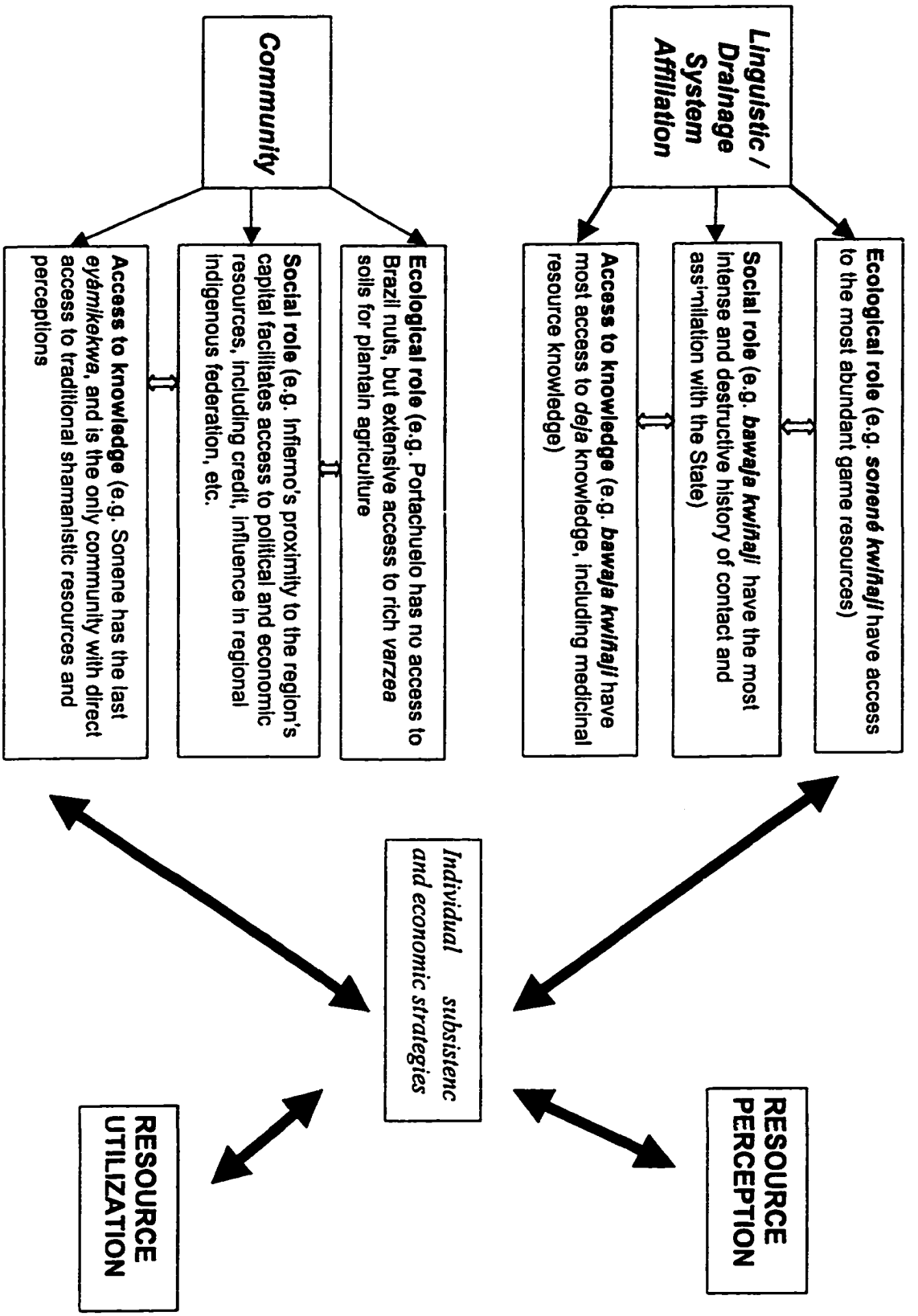

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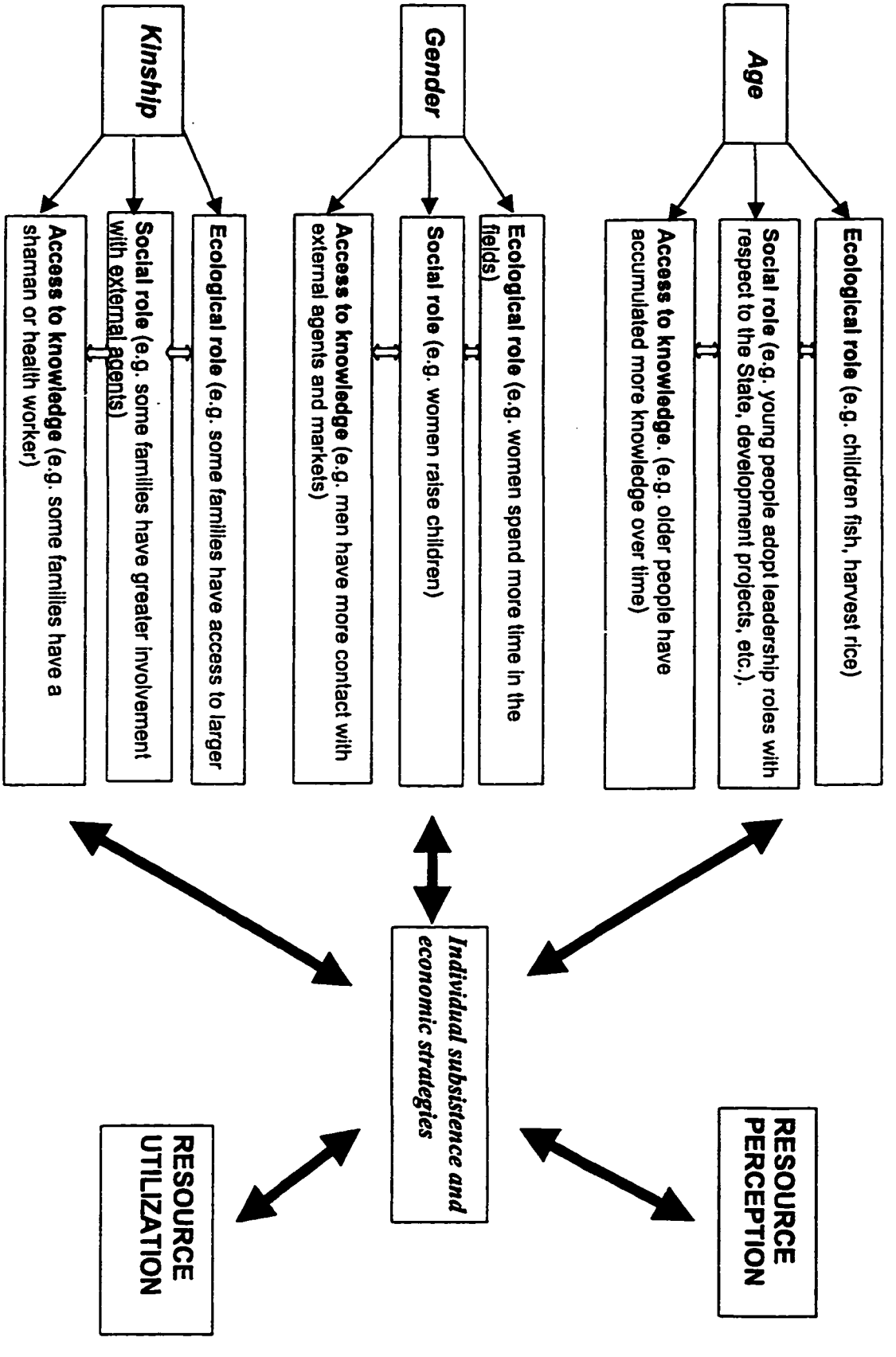
Fig. 10.3 Socio-cultural variables and intra-community variation



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Inter-community variation

Most reports of ethnobotanical intra-cultural variation have been noted in the context of differences between communities of the same ethnic group (Berlin, 1974; Milliken et al.,1986; Plotkin, 1986). Inter-community variation among the Ese Eja is facilitated by:

- dispersal of communities over a large, ecologically diverse area.
- relative isolation between communities, particularly between those at the extreme ends of the distribution range of the Ese Eja, such as between Portachuelo and Infierno.
- political and historical differences between different communities, in terms of economic, ecological, and State relations.

Table 10.1 compares the characteristics of responses to the ethnomedical interviews from two communities, Sonene and Portachuelo Bajo. Portachuelo Alto and Villanueva, the two other communities included in the study, were excluded from this analysis because their sample sizes were too small. Furthermore, even though Portachuelo Alto is geopolitically part of Portachuelo Bajo, Portachuelo Alto is composed principally of a disjunct group of ***Sonené kwiñaji*** who migrated into the area in the 1960's, and who therefore speak a different dialect to the Ese Eja in Portachuelo Bajo.

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Because the samples of respondents included in the ethnomedical census was biased towards women, the sub-samples used in this analysis were balanced for gender. This was done by removing the data from 3 and 14 randomly selected women respondents from the of Sonene and Portachuelo data sets, respectively. This was done in order to ensure that any observed differences between Portachuelo and Sonene are not due to the different gender ratios in each sample, given that gender is potentially important in accounting for intra-cultural variation. That is, by normalizing the two data sets in terms of gender, I hope to identify variations related to linguistic and community affiliation.

Table 10.1. *Distribution of medicinal knowledge in two Ese Eja communities: Sonene (Rio Heath, Peru) and Portachuelo Bajo (RioBeni, Bolivia).*

	Percentage of Reports		**Number of Species**	
Activity Context	Sonene	Portachuelo	*Sonene*	*Portachuelo*
Gastrointestinal	22%	39%	28	20
Skin infections	21%	12%	42	10
Fever	10%	6%	22	7
Reproductive	10%	7%	22	5
Traumas and body aches	7%	2%	21	3
Respiratory infections	8%	11%	18	5
Eye, ears	5%	6%	12	5
Teeth	5%	7%	9	3
Panacea	4%	1%	20	1
Animal bites	3%	1%	15	1
Child care	2%	5%	7	1
Miscellaneous	3%	2%	19	4

Sonene:
Total Reports: 664
Total No. of Species: 140
Informant Sample Size: 22

Portachuelo Bajo:
Total Reports: 170
Total Number of Species: 46
Informant Sample Size: 18

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Distribution frequencies of reports are tabulated as percentages of totals, in order to facilitate comparison of data sets, since the total number of reports elicited from the informant pool in each community are different. While the most salient activity contexts in both communities are gastrointestinal and skin infections, the former is nearly twice as salient in Portachuelo as compared to Sonene. Gastro-intestinal ailments tend to become more prevalent at higher population densities (see chapter 11), which are typical of Portachuelo. One possibility therefore, is that the higher salience of gastro-intestinal categories in Portachuelo reflects higher pressure from this ailment. Unfortunately, our analysis of morbidity data is incomplete at this time.

Aside from differences in how medicinals are or perceived, there appear to be marked differences in the degree to which medicinals are actually employed. The presence of a mission clinic in Portachuelo means that manufactured medicines are an accessible and frequently used resource in this community[2]. Differential access to cosmopolitan medicine and manufactured drugs may thus account for some differences in the utilization of plant medicines between communities. Our direct observations, though not quantified, clearly indicate that the Sonene Ese Eja, and particularly women, use plants in health care more frequently, readily and consistently than Portachuelo Ese Eja. Milliken and Albert

2. Although the clinic is run by the mission, treatments are dispensed by mission-trained Ese Eja health workers. Additionally, a credit system allows patients to receive treatment even if they have no money. The economic and cultural accessibility of pharmaceuticals in this community, coupled with the fact that the clinic is well-stocked and almost permanently staffed, contrasts sharply with most government health posts in other Ese Eja communities.

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(1996) have noted a similar inverse correlation between access to pharmaceuticals and use of herbal medicines for the Yanomami.

The lower dependence on medicinals in Portachuelo, as compared to Sonene, is supported both by the overall lower salience of medicinals, and lower number of species registered in the former compared to the latter. We recorded 664 reports and 140 medicinal species in Sonene, as opposed to 140 reports and 46 species in Portachuelo.

Differences in gender

Women are ascribed a greater role in the possession and use of medicinal resource knowledge among several groups, including the Yanomami (Milliken and Albert. 1996), Garifuna (Coe, 1994), and Caribs (Girón et al., 1991). Amorozo et al. (1988), noted the tendency for *caboclo* women in Pará to be more familiar with medicinal plants associated with fields and fallows, while men are more familiar with forest plants, though there are several exceptions. Table 10.2 shows the relative salience of different activity contexts for comparable samples of male and female Ese Eja informants.

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Table 10.2. *Distribution of medicinal reports for men and women in Sonene (Rio Heath, Peru).*

ACTIVITY CONTEXT	RESPONSE RATE (%)		NUMBER OF REPORTS	
	women	*men*	*women*	*men*
Gastrointestinal	100	100	79	69
Skin Infections	100	82	78	62
Reproductive	100	91	42	22
Fever	91	91	40	29
Traumas And Body Aches	82	45	30	18
Respiratory Infections	82	82	28	22
Teeth	82	45	23	13
Eye, Ears	82	55	22	12
Child-Care	55	27	8	6
Panaceas	45	45	8	16
Animal Bites	36	36	5	15
Miscellaneous	64	45	8	14
Total	100	100	371	298

men:
Sample size: 11
Species reported: 117

women:
Sample size: 11
Species reported: 89

Table 10.3. *Number of species reported by men and women in Sonene (Rio Heath, Peru).*

ACTIVITY CONTEXT	MAX # SPP/ INFORMANT		MEAN SPP/ INFORMANT		TOTAL SPECIES	
	women	*men*	*women*	*men*	*women*	*men*
Gastrointestinal	12	9	6.5	5.7	23	22
Skin Infections	11	12	6.9	6.9	28	32
Reproductive	8	5	3.9	2.2	16	15
Fever	9	8	3.9	2.9	15	19
Traumas And Body Aches	11	5	3.3	2.6	14	12
Respiratory Infections	6	4	2.9	2.0	14	9
Teeth	3	4	2.1	2.4	9	7
Eye. Ears	5	4	2.8	2.0	9	8
Child-Care	2	3	1.3	2.0	4	4
Panaceas	4	10	2.0	3.0	7	14
Animal Bites	2	4	1.3	2.3	4	11
Miscellaneous	2	8	1.2	2.8	7	14
Total					89	117

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The pooled results of male and female informants suggest that gastrointestinal and skin infections are the most salient categories for medicinal utilization, and hence suggest intra-cultural agreement, at least with respect to gender. Predictably, treatments associated with reproduction are associated with higher salience among women. The data also suggests that fever, traumas and body aches, tooth ache and eye and ear infections have greater salience among women. The treatment of fever is certainly associated with child-care, though other activity contexts related to child-care do not show marked differences.

In general, response rates and number of reports were greater among women. These results match observations indicating that most instances of medicinal use involve women. This is consistent with their primary role as caretakers of children, among whom most illness episodes occur. In contrast, men reported a larger number of species, particularly with regards to the use of medicinals for animal bites, panaceas and miscellaneous categories. This may reflect in part greater concern with these activity contexts, but also greater exposure to external knowledge.

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Chapter 11.

Medicinal Resources and the Chemical Ecology of Culture Change

Introduction

Throughout earlier chapters, I suggested proposed that Ese Eja subsistence strategies have been profoundly shaped by the interrelated processes of increased contact with the nation state and the market economy and sedentism, particularly over the last 100 years. During this period, there has been an unequivocal transition from small, and mobile bands subsisting from hunting, fishing, gathering and plantain-based agriculture, to more sedentary, agriculture-based and market-driven subsistence strategies[1]. The settlement of Ese Eja groups around missions, trading posts and routes, "barracas", and more recently, titled communities with access to centralized education and health care, have all resulted in larger population densities, more stable residences, less diversified subsistence activities, and an increasingly stressed resource base. The impacts of these ubiquitous processes upon the health of indigenous societies have been extensively documented among tribal societies world-wide, suggesting a clear

1. This transition has not been uniform or constant: it has been frequently interrupted, and has taken place earlier and more consistently among certain groups of Ese Eja than others. However, the tendency toward increased sedentism has been unequivocal and increasingly generalized over time, particularly in the last 50 years.

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tendency toward increased pressure from infectious diseases and nutritional stress (e.g. Kroeger and Barbira-Freedman, 1982; Wirsing, 1985).

I have also suggested that plants have become in Ese Eja health care, both as symbolic objects in healing and shamanistic discourses, and as resources to treat specific symptoms and ailments. In chapters 8 and 9, I indicated that over half of all medicinal plants inventoried to date, have been incorporated in the recent historic past, as a result of direct and indirect contact with other Amazonians. This figure is even higher, among the most widely utilized species.

In this chapter I explore the possibility that these two processes, the changes in health conditions following increased sedentism, and the recent incorporation of a significant repertoire of medicinal resources, may be related. Certainly, the potential adaptive value of medicinals is very likely, given the empirical basis of their use and selection, and their unquestionable status as pharmacodynamic objects.

Health and culture change

There is considerable ethnohistorical, demographic and epidemiological evidence to suggest that contact and incorporation of aboriginal societies into larger socio-economic systems has generally been characterized by an increase in the prevalence and intensity of existing infectious diseases and parasites, as well as by the introduction of new pathogens. That is, culture change among

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aboriginal populations has produced a shift in the balance between hosts and parasites, both qualitatively and quantitatively. Rather than review the voluminous literature documenting this process, an enterprise that exceeds the scope of this discussion, I will summarize some of the mechanisms whereby sedentism and a shift toward agriculture-based subsistence, adversely impact health.[2]

Repeatedly, the first consequence of contact, both direct and indirect, between Amerindian aboriginal populations and colonists of European descent is the repeated outbreak of epidemics, leading to demographic collapse and in some cases total extinction. The extreme vulnerability to small pox, measles, influenza, para-influenza and rhinoviruses have consistently placed Amerindians at a tremendous disadvantage in their interactions with Europeans (Cook, 1998; Crosby, 1982; Hemming, 1987). Epidemics began to decimate indigenous populations almost immediately after the arrival of the first European settlers to the Americas (e.g. Ramenofsky, 1987) and continues to this day (e.g. Zarzar, 1987). Measles, smallpox and other epidemics ravaged the Ese Eja population during the first half of the 20th century, driving neighboring groups, such as the Toyeri, to extinction. Most Ese Eja over the age 60 vividly remember the horror and devastation as the corpses of entire families were left unburied,[3] as survivors

2. Excellent reviews of this subject are provided by Cohen (1989) and Wirsing, (1985) . For evidence on the health and nutritional status of isolated populations, see also Wadsworth (1984).

3. Normally, the Ese Eja would dispose of the dead by burying them on sand river bars. Today, the dead are buried together, in an area set at a distance from the village referred to as "panteón".

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escaped upriver. As late as 1962, a measles and small pox epidemic reduced the population in the community of Palma Real from 250 to 80 (Zeleny, 1976:88). The Ese Eja population has only recently begun to recover demographically, and the population of several hundred compares starkly to the thousands reported earlier this century (see chapter 4). ***Chihi*** and ***wo'o***, as measles and smallpox are known, are still dreaded, and recur as powerful images during shamanistic healing rituals.

In addition to these major killers, contact with African and European populations has also led to the introduction of a large number of other diseases in Amazonia, including malaria, yellow fever, polio, tetanus, rubella, and tuberculosis (Black, 1975). Some of these, especially malaria and tuberculosis, have reached epidemic levels in some areas (e.g. Colchester, 1985). The introduction and diffusion of new diseases is an ongoing process. Diseases such as onchoceriasis and schistosomiasis are expected to become endemic in the future (Hern, 1994), while the potential impact of AIDS among tropical forest populations is not fully understood.

A common and temporarily effective response to epidemic outbreaks is to disband into small groups and retreat into isolation. Early contacts between the Ese Eja and the nation state were marked by outbursts of epidemics, which led to temporary disbanding and retreat to the headwaters.. Hence, the characterization of native Amazonians as semi-nomadic, hunter-gatherer or

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semi-nomadic swidden horticulturists frequently needs to be qualified within a historical context (e.g. Balée, 1994). As I discussed in chapters 4 and 5, it is possible that the characteristics of Ese Eja settlement and subsistence patterns at the turn of the century reflected adaptation to the social, as well as ecological environment of the time. Certainly, the highly mobile lifestyle and opportunistic subsistence was well suited to a frequently hostile social environment, as well to a natural environment which contained multiple resource "windows of opportunity", following the decimation of neighboring ethnic groups. Likewise, it is possible that the lifestyle that characterized the Ese Eja at the beginning of the colonization process, also reflected the consequences of demographic collapse and dislocation resulting from earlier epidemics and warfare.

Semi-nomadic lifestyles, low population densities and the relative isolation characteristic of the Ese Eja at the time of direct intensified contact with missionaries, traders and rubber tappers, are known to curtail the prevalence of certain infectious diseases (Coimbra, 1988). For one thing, some diseases are unable to persist in small groups: measles for example, requires a population of 200,000-1,000,000 persons to keep the virus circulating in a population (Black et al., 1971). Furthermore, mobility and village relocation limit both prevalence and intensity of fecal-orally transmitted diseases (Dunn, 1968; Polunin, 1967). This is because periodic re-location limits the build up of human waste in the soil and water. Moreover, the probability of re-infection by parasites with a part of their life-cycle in the soil is significantly reduced (Neel 1971). Thus, prevalence and

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levels of infestation of such parasites as *Ascaris*, *Ancylostema* and *Necator*, and the impact of diseases such as Schistosomiasis and malaria, are curtailed by nomadic and semi-nomadic lifestyles (Cohen, 1988: 41).

The ecological complexity and bionomic isolation typical of the subsistence and settlement patterns of small indigenous groups tend to favor co-endemicity of many parasitic and infectious diseases, but at low intensities (Dunn, 1968). This follows from a basic ecological tendency, whereby parasitic infections in more complex ecosystems tend to be characterized by a wide prevalence of infection by multiple species, but at low intensities[4]. Dunn (1972) has provided quantitative evidence to suggest that as ecosystem complexity decreases, parasitic infections occur with fewer species but at higher levels. This has been further substantiated by field observations among extant hunter-gatherers (Larrick et al., 1979).

The health implications of these dynamics are quite significant, since high prevalence of infestation does not necessarily create health problems[5]. Rather, it is the high intensity of helminthic infestation, particularly of *Ascaris*, that associated with sedentism, and which is correlated to anemia, malnutrition, gastrointestinal disorders, and lowered resistance to other diseases (Blumenthal and Schultz, 1976; Layrisse et al., 1967; Stephenson, 1980; Tripathy et al.,

[4] Prevalence of infestation refers to the proportion of subjects infected, intensity of infestation refers to the parasite load on the hosts.

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1971). Thus, while the most common helminthic parasites, *Ascaris*, *Trichuris*, *Ancylostema* and *Strongyloides*, have been widely reported among a wide range of aboriginal populations, there appears to be a link between sedentism and the higher, more pernicious, intensity of infestation (Takemoto et al., 1981).

Larger population sizes and densities, associated with sedentism and market-based agriculture, all increase direct and indirect transmission of air-borne, vector-borne and fecal-oral diseases (Cohen, 1988: 48), leading to a sharp increase in gastrointestinal and respiratory infections. Prevalence and intensity of fecal-orally transmitted diseases is also increased by such practices as raising domestic animals, including chickens, ducks and pigs, all associated with a sedentary lifestyle. Insect and rodent populations, which include disease vectors and hosts, grow rapidly as crops provide new food supplies, and as human waste accumulates (Goodland and Irwin, 1975).

Nutritional and dietary changes, associated with sedentism, create additional health problems. Sedentism and culture change are frequently associated with a decrease in dietary diversity, increasing the likelihood of specific nutritional deficiencies (Behrens, 1986), or reducing protection against certain infections (Ross et al., 1996). The correlation between dietary impoverishment and dependence on the market economy has also been noted for peasant

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5. Prevalence is also a poor of intensity of infestation (Dunn, 1968), yet frequently is the only measure of parasitism provided by many surveys. Unfortunately, data regarding actual rates of infestation is scarce and frequently not comparable (Strongin, 1982).

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communities during the shift from subsistence to commercially-driven agriculture (DeWalt,1983; Dewey, 1981).

Sedentism may eventually lead over-exploitation of local forest resources, particularly game, with a consequent impact on nutrition (Hames, 1980; Colchester, 1981; Lizot, 1976b). Resource degradation is further exacerbated by access to technology such as fishing nets and firearms, by the transformation of game and fish into commodities, which are traded or sold in order to purchase manufactured goods, and by the competition over resources with immigrants and colonists (Stearman, 1990). Malnutrition and infectious diseases, including parasitism, act synergistically (Solomons, 1984; Tripathy et al., 1971).

Shifts in dietary preferences following introduction of new cultigens and commodities also affect the health status of indigenous populations. The introduction of cane sugar for example, is associated with deterioration in dental health (Abbie, 1960). Poor dental health is generally correlated with degree of acculturation (e.g. Donnelly et al 1977, but see Larrick et al. 1979, for an exception). Likewise, use of bottled milk, increasingly prevalent among the Ese Eja communities, is associated with higher incidences of gastrointestinal disorders and higher rates of infant mortality (Jelliffe, 1962).

Changing in housing styles and residence patterns exacerbate the health problems associated with crowding and increased direct transmission of

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infectious diseases (Kroeger, 1980). Permanent shelters attract vermin and disease vectors. One simply has to recall the impact of the plague- transmitted by rats- on Europe's population in the middle ages, to note the significance of this factor (McNeill, 1989). Similarly, urban yellow fever and dengue, are transmitted by a mosquito living almost exclusively around water stored in dwellings (Desowitz, 1980, Johnson, 1975;).

In short, the transition toward a sedentary, agriculture-based lifestyle is associated with a number of epidemiological, ecological and social processes, whose synergistic effect is that of increasing the pressure of infectious agents upon the human population. These processes not only facilitate the reproduction, transmission and re-infection of pathogens and parasites, but also reduce the resistance to disease through nutritional stress. This latter factor appears to be key, and may explain why some acculturating indigenous groups have been able to maintain good health (e.g. Flowers, 1994; Holmes, 1985). The decline in health conditions is thus not due to culture change itself, but the onset of ecological and socio-political changes which ultimately undermine indigenous access to natural resources (Schmink and Woods, 1984). That is, culture change and insertion into market systems often sets in motion a series of interrelated social and ecological changes, which in turn impact health conditions. Hence the repeated observation that degree of contact and culture change is associated with lowered nutritional and health status (Bennett, 1990;

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Dricot-D'ans and Dricot, 1978), including higher rates of infant mortality (Kroeger and Barbira-Freedman, 1982).

The tendency for indigenous peoples to be drawn into broader political and economic systems under conditions which favor increased social, economic and ecological marginality, explains why patterns of morbidity in acculturating indigenous communities are shared by the World's poor and disenfranchised. For example, 70% of the 14 million children who died in 1987, died from diarrheal diseases, malaria, measles and acute respiratory infections (Rubinstein and Lane, 1990). Diarrhea alone accounts for 5 million deaths a year, half of which are among children less than 5 (Donowitz et al., 1990). These health problems are both directly and indirectly related to poor sanitation, malnutrition and poverty.

The link between sedentism and the rise in infectious diseases is neither recent nor restricted to aboriginal populations; rather, it seems to be a critical aspect of much of human history (Hassan, 1975). Cohen (1989) suggests that throughout human evolution, the transition from hunting bands to agricultural societies has been accompanied by an increase in the prevalence and intensity of infectious diseases. Moreover, this has taken place independently of the introduction of new diseases. Indeed, there is evidence to suggest that the emergence of those very diseases which wreaked havoc among the population of the Americas- smallpox, measles, rubella, rhinoviruses and influenza viruses- are recent, and

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related to the expansion of agriculture and animal raising in the Old World (ibid). That is, the shift towards agriculturalism and large population densities associated with the development of state societies in the Old World, created the appropriate conditions for the evolution and development of large numbers of infectious diseases.

These changes would, under most circumstances, create a tremendous pressure, favoring the diffusion of effective medical resources. One might anticipate that an increase in pressure from diseases would lead to an increase in the use of pharmacodynamic substances, particularly if these are readily accessible and effective. This indeed appears to be the case among the Ese Eja.

Medicinal resources and indigenous adaptations to sedentism

In his discussion of the origins of human diet and medicine, Timothy Johns (1990) examines the evolutionary implications of diet and agriculture on health and medicine. Johns suggests that humans have developed an evolutionary dependence on toxic secondary compounds, identified as unpalatable through the chemosensory perception of bitterness. According to this model, hominids were coincidentally exposed to plant secondary compounds from the beginning of their omnivorous existence, through the consumption of wild plant foods,

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subsequently becoming dependent on them to maintain a balance with surrounding parasites and pathogens. Intense selection pressures on plants during the domestication process, and the increased dependence on agriculture as a subsistence activity, could have led to a concomitant decrease in the intake of pharmacodynamic compounds as part of human dietary intake. In order to compensate for this loss, and following increased presence of diseases associated with greater population densities, humans began to directly ingest plant secondary compounds, in order to compensate for the decline of these compounds in diet.

Johns' chemical ecology model is useful in that it provides an evolutionary context to understanding the role of medicine with respect to diet and the evolution of agriculture. As a model, it would seem to have great potential in explaining, or at least suggesting, a similar process, at a smaller scale, in the post-contact history of tribal indigenous groups. Theoretically at least, it supports the notion that widespread use of medicinal agents may be a historically rather recent tendency among many Amazonian groups. Earlier (see chapter 8), I suggested that the Ese Eja themselves identify a link between contact with external agents and disease. Likewise, they maintain that plants have become increasingly important in health care, and that much knowledge of medicinal plants is the product of contact ***deja***: other Amazonians and people brought into the area during the rubber boom. Hence, there is considerable circumstantial and

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indirect evidence to suggest that medicinal plants may have played an important adaptive role in the process of contact and sedentism.

The data presented in chapter 9 suggests that gastrointestinal and respiratory disorders are the most salient activity contexts associated with Ese Eja medicinal plant knowledge. Because a significant number of these treatments appear to have been recently incorporated and because these ailments are associated with the ongoing transition in Ese Eja subsistence and settlement patterns, it would seem that Ese Eja medical thought and behavior is adaptive and dynamic.

The case of intestinal parasitism and the use of plant antihelminthics illustrates what may be an ongoing transition in Ese Eja ethnomedical and ethnobotanical perceptions and behavior. I have already noted how the Ese Eja regard intestinal worms as normal, and only treat this condition in severe cases, a tendency that has been also noted for other Amazonian groups (Hansson et al., 1986; Strongin, 1982) and other societies[6]. These views are somewhat substantiated by data which indicates that it is intensity of infection, coupled with malnutrition that render the condition deleterious to health, as opposed to simple prevalence or presence of parasites (see above discussion). In any event, most Sonene Ese Eja treat parasites only rarely, even though most adults are aware of available plant remedies. The widespread use of plant antihelminthics by Ribereño and some indigenous populations (Berlin and Markell, 1977) may suggest an

6. In fact, among the Thonga of Africa, intestinal parasites are seen as a necessary ingredient for digestion (Ackerknact, 1946).

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adaptive response to the higher intensity of infestation associated with more permanent settlements. This notion is supported by the medical efficacy of plant-based antihelminthics (Hansson et al, 1986), and the fact that periodic de-worming of children can lead to improved growth and development (Stephenson, 1980). The Ese Eja view of antihelminthics as a ***deja*** activity context further lends support to the notion that specific medicinal resources are associated with health changes brought about by sedentism.

Few ethnobotanical studies have examined the relation between contemporary medicinal resource utilization and recent changes in patterns of infectious disease. Brooker and Cooper (1962, cited in Johns, 1996) and Te Rangi Hiroa (1970, cited in Johns, 1996) note that Maori ethnobotany was substantially expanded following the introduction of diseases during European contact. Posey (1994), suggests that the deculturation process among the Kayapó and the widespread death of shamans through epidemics, led to the emergence of many "plant knowers" who specialized in the curative properties of certain plants. Likewise, Davis and Yost (1983b) report that a group of Waraoni who had remained relatively isolated from the effects of direct contact until recently, possessed a relatively simple and limited pharmacopoeia. These authors were the first to make an explicit link between Amerindian acquisition of knowledge of medicinal plant resources and intensified contact with nation states following the rise in infectious diseases. Most of the 35 plants collected by Davis and Yost, were used to treat bacterial and fungal infections, snake and insect bites, fevers,

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pains, traumatic injuries and dental problems. Aside from the latter, these are the kinds of health problems associated with small, mobile and isolated populations of hunter-gatherers and which are thought to have prevailed among hunter-gatherer groups prior to extended contact. Indeed, the types of infectious diseases reported for most Amazonian groups, including bacterial and parasitic infestations appeared to be rare among the Waraoni.

While many authors have noted the ease with which plant knowledge and materials are diffused (e.g. Bennett, 1992b:603), the process has not been systematically examined. I suspect that its importance, particularly with regard to medicinal plants, may have frequently been underestimated. Milliken and Albert (1996, 1997) for example, note that the Yanomami repertoire of medicinal plants includes a number of treatments associated with recently introduced diseases, including malaria. The authors suggest individual experimentation and diffusion as possible explanations for the development of "new" ethnobotanical knowledge[7].

I have already noted the ease with which ethnobotanical knowledge is exchanged between the Ese Eja, as well as between the Ese Eja and other

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7. Interestingly, earlier ethnobotanical reports indicated that medicinal resources played a minor role among the Yanomami (Biocca, 1979, cited in Milliken and Albert, 1996; Plotkin, 1993; Prance, 1972). While noting that medicinal resource utilization has been largely supplanted by allopathic medicines, Milliken and Albert have rectified these early impressions to the point of suggesting that Yanomami pharmacopoeia might "...in time be one of the most diverse recorded [among Amazonian indigenous groups]" (ibid, 1997:272). The authors suggest that the near-disappearance of ethnobotanical knowledge due to recent epidemics, coupled with gender bias among male researchers may explain this discrepancy in observations.

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Amazonians. Given the observation that other indigenous groups seem equally eager to incorporate ethnobotanical knowledge (Milliken and Albert, 1996:23), one might well expect this process to be widespread and highly significant elsewhere in Amazonia. Posey for example, notes that plants "remain one of the most common gifts exchanged between Kayapó visitors from different villages" (Posey, 1994:278). The trade of arrow poisons among lowland peoples in Amazonia is well documented (Bennett 1992b). Considering how widely, rapidly and effectively plant domesticates, cultigens and other anthropogenic objects have been distributed, exchanged and incorporated in pre- and post-Columbian history, it is not unreasonable to suppose that knowledge has been at least equally shared and diffused.

I am not implying that the Ese Eja have only recently started to "use" medicinal plants. Rather, I suggest that the role and relative importance of such resources appears to have changed in recent historic times, and that these changes are in turn associated to broader ecological and socio-cultural processes. Specifically, the more prominent role of medicinals may be related to the general increase in the prevalence and intensity of infectious diseases, and may have been favored by a post-colonial contact and exchange between Amazonian groups. Certainly, there is considerable epidemiological and ethnographic evidence to suggest that this might frequently have been the case.

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Conclusions

Human-plant interactions are complex, multi-dimensional and dynamic processes. On the one hand, plants have distinct physical and chemical properties, and these form an important basis for their use in medicine, diet, agriculture and technology. There is an empirical basis to ethnobotanical knowledge, the origins of which may well trace back to our hominid ancestry. The utilitarian dimensions of human-plant interactions have been of particular interest to economic botanists and to those informed primarily by adaptationist perspectives.

Reducing human-plant interactions to a utilitarian perspective however, fails to embrace some critical and theoretically challenging aspects of the roles that plants play in human society and culture. For one thing, all sensory perception, including chemo-sensory perception, is ultimately interpreted, transmitted and employed in cultural contexts, and according to specific cultural expectations and needs. While some of these processes recur fairly consistently in different cultural settings, at other times there is a high degree of specificity, and both of these outcomes may reflect important aspects of both the plants and the society in question.

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While the existence of culture is no longer thought to be the exclusive domain of humans (e.g. Bonner, 1980), there is no question that the degree to which culture shapes human thought, perceptions and behavior is by far unparalleled. As Professor Eric Wolf once commented in a class lecture, "humans are strange symbol-creating animals". The degree to which human thought and experience are structured in abstract, symbolic terms introduces yet another level to the complexity of human-plant interactions. Abstract realms of experience, including awareness of self, others and of death, are often constructed and communicated to others using tangible objects and relations as frames of reference. Plants and human-plant interactions are often "used" as the building blocks for metaphorical representations, and the nature of such representations reveal much about deeper social and ecological processes and concerns.

The properties of plants are the product of dynamic and variable interactions. Plant secondary compounds for example, are often produced in response to specific environmental interactions, conditions and stresses, including competition, predation and reproduction. Because the nature and intensity of these interactions vary in time and space, so do the responses they elicit. Moreover, humans intentionally and unintentionally manipulate the properties of plants through artificial selection and management. Thus, human-plant interactions have complex evolutionary and ecological dimensions.

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The form and intensity of human-plant interactions not only reflect the properties of the plant taxa in question, dynamic and variable as these are, but also the needs of the human society. Human needs in turn are conditioned by a broad range of factors, including the characteristics of the environment, the structure of economic relations and social organization, and access to technology. Human-plant interactions are thus embedded in a matrix of social, cultural and ecological relations and processes.

In this study, I have attempted to acknowledge and integrate these different aspects of human-plant interactions within the context of health and healing. My experience with the Ese Eja suggests that plants indeed play multiple roles, and that these roles are often interrelated and embedded in a fabric of social and ecological relations. In addition, I suggest that contemporary Ese Eja ethnobotanical interactions are inextricably linked to historical processes associated with colonization, and to the specific experience of contact with market agents.

Plants and Ese Eja society

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The use and importance of medicinals

Medicinal substances are an important health resource for the Ese Eja. Unlike other ethnic groups, much medicinal plant knowledge is not associated with specialized roles: rather, most medicinals fall largely within the realm of the household knowledge and behavior. In total, I have inventoried 190 plant species and about 50 animal species, used for a wide range of conditions or activity contexts. The range of activity contexts included by the Ese Eja category of medicinal does not fit squarely with cosmopolitan notions of medicinal plants. For the Ese Eja, medicinals are substances used to manipulate an individual's physiological, social or ecological environment. Some medicinals are used to effect changes in other humans, as well as domestic and wild animals. The ability of medicinals to effect or manipulate change lends them an ambivalent aura. Some medicinals may in fact harm people, either through the action of a person or the willful intent of the vital force, **eshawa**, embodied by the medicinal.

Medicinals are generally selected according to the visible symptoms of illness, as opposed to a diagnosis of the presumed causes. Diagnosis, in contrast, is usually effected retroactively. Failure of a medicinal to eliminate specific symptoms is first interpreted as the need for a "stronger" medicinal. Failure of successive treatments suggests a more serious condition, which may eventually require treatment by a specialist.

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Medicinals are chosen according to a number of criteria, of which efficacy and accessibility appear to be the most important. The importance accorded to each varies according to the duration and intensity of the symptoms treated and the characteristics of the patient, notably age and vigor. Accessibility, a function of the plant's abundance and distribution or habitat range, is generally a more important consideration in earlier treatment attempts. Only if the first treatments fail does efficacy become a primary criterion. Some of the most highly esteemed, but not accessible, remedies are thus used only occasionally.

The cognitive salience of activity contexts and medicinals, as evidenced by the relative frequency with which they are reported by a sample of Ese Eja informants, is quite variable. This variability appears to be determined, or at least influenced, by a broad range of factors and processes, which in turn relate to the multiple roles of medicinal resources as pharmacodynamic, ecological and symbolic objects. Medicinal knowledge is thus spatially and temporally dynamic and variable. Aside from a considerable degree of idiosyncratic knowledge, about 40% in my data set, there also appears to be a degree of patterning in the way knowledge is distributed.

Ese Eja ethnobotany and culture change

Overlaying the diversity of landscapes and vegetation types in Amazonia, is a complex history of human migrations, displacement and culture change.

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Although cultural and ethnobiological configurations in Amazonia had already undergone dramatic changes before the arrival of the first Europeans, colonization triggered a wide range of processes whose complex interactions led to the development of "new societies with novel relationships to the flora and fauna of particular regions" (Balée, 1995).

Demographic collapse, one of the earliest consequences of the European arrival to Amazonia, radically transformed the characteristics of Amerindian social and ecological relations. The fragmentation of indigenous societies into smaller, mobile groups appears to have been a widespread response to the earlier onslaught of epidemics (Posey, 1994). Unfortunately, there is very little data on Ese Eja subsistence before the early 20th century. The fairly small, highly mobile trekking bands typical of the Ese Eja at this time could reflect adaptations not only to a biological environment, and specifically to the temporal and spatial distribution of protein resources, but also to the social and political environment of the time.

Prior to large-scale colonization of the area, several bands of Ese Eja had established themselves along the Madre de Dios river (Aza, 1934), far away from the headwater regions typically associated with the Ese Eja, and in forests once populated by what appear to be non-Tacana groups[1]. One possible scenario is that Tacana groups, thought to have originated in Eastern Bolivia- close to

1. These groups were most likely Arawak, Harakmbut or Panoan.

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Llanos de Moxos- (Lathrap, 1970), began to migrate northwest along the foothills of the Andes either before or shortly after European conquest in the 16th century. It is quite possible that these early societies underwent considerable re-organization, particularly if they suffered significant demographic collapse in any way analogous to those in other parts of Amazonian (e.g. Posey, 1994).

Dramatic depopulation through internecine warfare and epidemics during the early 20th century may well be linked to changes in social organization, including the demise of ***etii***, or headmen, as well as that of ***eyámikekwa*** shamans. The social and ecological reconfiguration of the Ese Eja was also compounded by the growing dependence on external agents- missionaries and "patrones", which required new types of subsistence strategies, political alliances and social structures. In the last 30 years particularly, there has also been increased direct contact between the Ese Eja and the nation state, in the form of schools, health care, development programs and land reform agencies.

The specific circumstances and characteristics of contact between the Ese Eja and the nation state are strongly conditioned by the nature of the physical environment. Living at the intersection of two important ecological gradients, one altitudinal and one latitudinal, the Ese Eja inhabit an ecologically diverse landscape. The inaccessibility of the rugged headwater region was consistently used by the Ese Eja as a means to mediate contact with Europeans during the 19th and 20th centuries. The process of increased contact and assimilation into

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the nation state entailed a net migration down river, away from the piedmont and toward urban centers. In a sense there is an overlay between history and landscape, so that rivers flow across a symbolic time-space continuum.

The isolated and uninhabited headwater regions represent one end of this continuum. The headwaters are a place of mythic origins, spirits and ancestors, of ***eshawa***, ***emanokwana*** and ***edósikiana***. These supernatural agents are in turn closely associated with game, the forest and the ***eyámikekwa***. In contrast, the lower portions of the rivers are associated with ***deja***, urbanization, and numerous other signifiers of modernity.

The migration of the Ese Eja toward the mouths of the rivers also embodies an economic, social and historical transition. The physical location of most Ese Eja between the headwaters and the mouths of rivers is overlaid has important social and ecological connotations. Each pole in this spatio-temporal continuum of Ese Eja historical experience is characterized by a cluster of resource utilization practices. The headwaters are associated with semi-nomadic lifestyle, characterized by the central importance of game, and complemented by plantain agriculture. The view of the Ese Eja, as a "traditionally" fauna-oriented society is evidenced in Ese Eja mythology and ethnotaxonomy.

In contrast, the lower reaches of the rivers are associated with less game, and more intense interactions with all that is ***deja***, such as centralized government

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services, markets, and manufactured objects. Sedentism tends to deplete local game and wild resources, and favors an increased dependence in agriculture as a subsistence strategy. Most interactions with the market revolve also around the commercialization of plant products, both wild and domesticated. Rubber-tapping, brazil nut harvesting, collection and weaving of *Geonoma* palm thatch, logging and the sale of agricultural products are or have been the most important sources of income and barter.[2] That is, the process of socioeconomic and ecological change following increased contact with the nation state is overlaid by a shift towards plant-based subsistence activities. The symbolic importance of this relationship is underscored by the fact that many market-related plant products, including rubber, Brazil nuts and rice are from the lowlands, or have been, introduced from the outside.

The Ese Eja also classify medicinals in terms of their "origin". Those plants whose resource status reflects contact with ***deja*** are referred to as ***dejaha***. In contrast, plants native to the headwater regions or whose use is attributed to the ***etiikiana***, are identified as ***etiikianaha***. Through the projection of social categories and historical experiences, plants become powerful images of contact and inter-cultural relations. Medicinals are thus not used merely as pharmacological objects to treat particular symptoms, according to local

2. In chapter 5, I noted how plantains are the most important cash crop for Portachuelo Ese Eja. Although plantains dominated Ese Eja agriculture in the past, Portachuelo Ese Eja spend more time as a whole in agriculture today than in the past, and so the relationship between contact with markets and increased contact with plants holds there as well.

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conceptions of efficacy and action: they are also symbolic objects through which individuals position themselves socio-politically.

Medicinals appear to have adopted a more prominent role in Ese Eja ethnomedicine in recent history. Oral statements to this effect are supported by the fact that 17% of the 190 medicinals inventoried to date are introduced (exotic) species, and another 45% are native species whose use is explicitly identified as introduced through contact with ***deja***.

Data from other case studies suggests that the transition from high mobility and low population densities to a more sedentary, crowded existence is accompanied by an increase in the prevalence and intensity of infectious diseases. In the case of indigenous peoples, the increased pressure from diseases has been facilitated the introduction of new diseases and the consequences of social, economic and ecological marginalization.

The changing role of medicinals in Ese Eja ethnomedicine may thus be related to changes in the pressure and types of infectious diseases. Although I was not able to conduct any pharmacological tests on Ese Eja medicinals, there is indirect evidence to suggest an adaptive potential for these resources. About 75% of the medicinals inventoried among the Ese Eja are used in similar ways by other human groups. This figure is even higher when only the most salient or frequently medicinals are taken into account. Such consensus in medicinal plant

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utilization is widely considered an indicator of clinical efficacy. There is also substantial pharmacological and phytochemical evidence to suggest that these resources are biologically active and hence potentially adaptive.

Plants and shamanism

The Ese Eja cosmos consists of interrelated yet autonomous spheres or "spaces" which are arranged both vertically and horizontally. The "ground", "underground", "sky" layers, together with the forest, water bodies, headwaters, river mouths and ***kweyhana*** are some of the "spaces" of the universe in which Ese Eja society is embedded. For the Ese Eja, all these "spaces" are social spaces in that they are believed to be inhabited by human and extra-human beings whose lives are structured and organized in ways that mirror that of the Ese Eja. This worldview is distinctly ecological in that it emphasizes the interdependence between these different spaces and actors. Thus, just as the Ese Eja depend on killing game to survive, the "masters" of game, the ***edósikiana***, depend on killing humans to survive. Illness and death are seen as the consequences of predatory or retaliatory attacks on behalf of the ***edósikiana***. Hunting, in which the survival of an organism is contingent on the demise of another, serves as an important model to describe cosmological relations.

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Cooperation, next to predation, is another critical form of exchange and expression of the interdependence between the societies of the world, including that between nature and the Ese Eja. Alliances, based on mutual exchange and reciprocity are essential for survival. While such alliances are most intense and secure within one's kin or community, they necessarily branch out into more dangerous social spaces, including forests, rivers and cities, which inevitably places the individual at greater risk.

Collaboration, and its opposite, predation, represent two sides of the same coin. Both reflect the recognition of a deep interdependence between different agents in the universe, though in each case the dependence is expressed in opposite ways. As individuals, Ese Eja seek to position themselves in ways that maximize the benefits accrued from collaboration with other actors, and minimize their exposure to risks to predation, be it ecological, social or economic. The prevalence of illness and the inevitability of death however, attest to the fact that ultimately, as hunters, the Ese Eja are also prey.

Abundance of game and manufactured objects are seen as the product of a successful exchange with the forces that control these resources, ***edósikiana*** and ***deja*** respectively. Conversely, lack of game, "natural" disasters, illness and war are all expressions of predation. The ***edósikiana*** and ***deja*** thus have critical and parallel roles in Ese Eja worldview. While the ***edósikiana*** embody relations

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with the world of the forest and "nature", ***deja*** embody the world of the national society and the market.

In my discussion, I have suggested that different aspects of Ese Eja shamanism address these different domains of Ese Eja economy and society. Moreover, I suggest that the decline of the ***eyámikekwa*** shaman and the emergence of ayahuasca are related to broader shifts in the relationship between the Ese Eja and their natural and social universe. While the scope of action and logic of ***eyámikekwa*** shamanism is closely related to the forest, the ***edósikiana***, game and hence the past, ayahuasca shamanism is in turn associated with ***deja***, modernity and plants.

Views of nature, and more importantly, views of human-nature interactions, are expressed through shamanistic symbols and ritual. In this shamanistic worldview, I suggest, plants, and most specifically certain tree species characteristic of lowland forests, are used as symbols of ***deja*** and contact with ***deja***.

Culture change and ethnobotanical processes: theoretical implications

Evidence for substantial historical and ongoing changes in ethnobotanical processes, including diffusion of ethnobotanical knowledge, should hardly be

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surprising. After all, anthropologists and ethnohistorians have for quite some time provided substantial evidence to suggest the existence of complex and extensive trade routes and contact between different Amazonian societies, and between piedmont and Andean societies (e.g. Gade, 1972; Lathrap, 1981; Myers, 1983; Saignes, 1981). These systems of exchange have included exchange of shamanic knowledge (Harner, 1973) and plants (e.g. Ford, 1998; Hawkes, 1998; Kvist and Barfod, 1991; Stone, 1984; Yen, 1998). Likewise, large-scale human migrations have been documented, at different time-scales, for several ethnic groups, including, among others the Yagua (Chaumeil,1981), Secoya (Casanova, 1980), and Napo Quechua (Mercier, 1985).

The adaptability and capacity to incorporate new knowledge and undergo culture change may be particularly marked for oral societies without a written tradition to fix such cultural institutions as language and oral histories. For example, Henley (1982:11ff., cited in Meggers, 1995) reports variations in kinship terminology, material culture and ritual behavior as a result of less than a century of separation among Venezuelan Panare communities. While the diffusion of plants, objects and even technology can be traced through a number of techniques, tracking the diffusion of ethnobotanical knowledge is much more difficult. At the same time however, one can only assume that knowledge is diffused as readily, if not more so, than technological or biological artifacts.

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The adaptiveness and ability to dynamically respond to changes in ecological, social, and political forces is epitomized by ribereños and caboclos, who have incorporated and assimilated a broad range of techniques and concepts, devising ingenious means to adapt to the biological, economic and social environments of the varzea (Frechione et al. 1989; Parker, 1985; Padoch and de Jong, 1990, 1992).

Given the above evidence, it is somewhat surprising that so little attention has been paid to the evolutionary and historical aspects of medicinal resource utilization. The disregard for historical influences in contemporary ethnobotanical processes and patterns is identified by Roosevelt (1994) as part of an intellectual legacy in which today's native cultures are seen as ancient traditional adaptations to tropical forest environments "without reference to the many marked changes that have taken place in indigenous lifeways [...] in the last 500 years" (ibid:11).

Ethnobotanical and ethnomedical knowledge has frequently been assumed to be "ancestral", and accumulated over millennia (e.g. Plotkin, 1986: 377). As a corollary to this, extensive ethnobotanical knowledge is equated with cultural isolation, particularly from the effects of "westernization" which is seen as the inevitable agent of knowledge loss and cultural erosion.

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The possibility that Ese Eja ethnobotanical knowledge incorporates and reflects recent historical experiences, including contact with numerous external agents, challenges this simplified generalization. More specifically, the concept of "acculturation" needs to be carefully evaluated in the context of ethnobotanical processes. Certainly, many of the practices and objects held by many societies as emblematic of their culture and traditions can be seen to be the product of contact, often times recent, with other human groups. Some of the best examples of this can be found in diet. I have already noted that plantains, which available evidence indicate where introduced into the Americas as part of the Columbian exchange, are considered by the Ese Eja to be the most "traditional" cultigen. The ritual and symbolic importance of plantains in Ese Eja is unparalleled, particularly in the context of the ***eyámikekwa*** shamanism rituals discussed in chapters 6 and 7.

There are many other examples of post-Columbian exchanges that radically altered the eating habits of the world: the potato, tomato, chilies, and maize have become the key ingredients of "national" dishes in a matter of generations.

These observations challenge the generalized view that tropical forest indigenous medical systems and ethnobotanical knowledge are largely the product of ancestral knowledge that has survived the onslaught of contact. Instead I suggest that indigenous herbal pharmacopoeias reflect historical processes, including widespread acculturation and formation of the Amazonian

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peasantry (see for example, Amorozo and Gély, 1988; Furtado et al, 1978). Clearly, the extent and form to which these historical processes inform different ethnobotanical interactions needs to be evaluated on an individual basis.

Such a statement does not contradicted the large number of specific and dramatic observations of cultural erosion and loss of ethnobotanical knowledge among indigenous groups following direct contact with the nation state(Milliken and Albert, 1996; Posey, 1994: 276). The point is not that historical processes, and most notably colonization, have not led to erosion of knowledge, but rather, that at certain times during the process of contact, considerable amounts of knowledge have been exchanged and incorporated, at least by certain indigenous groups.

My experience suggests that although cultural and technological change does indeed have an impact on ethnobotanical knowledge and processes, the impact cannot be reduced to a simple case of genetic or cultural erosion. As human needs and technological capacities change, human-plant interactions are re-configured. Perceptions, technical knowledge, subsistence practices, and plant varieties all change as new relationships are forged with native and introduced biological organisms.

The dynamic, fluid nature of knowledge does not mean that all forms of knowledge are equally dynamic however. Marcus and Flannery (1978) for

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example, found that among valley Zapotec, classification of plants have remained largely unchanged since colonial times. Hence, it is quite likely that some types of knowledge are more conservative than others.

A unidirectional view of history whereby indigenous people are inevitably and invariably destroyed and culturally impoverished through the process of contact, is not only over-simplistic, but denies Amazonians a key element of their humanity: The remarkable capacity to adapt, reconfigure and define themselves socially, culturally and ecologically. An important question therefore, would be to identify the conditions that facilitate, as opposed to hamper, this process. In the context of ethnobotany, one might wish to examine the factors which have led to the exchange of and incorporation of knowledge as opposed to those which have lead to erosion of knowledge, exploring how knowledge is transferred and appropriated in different contexts.

The dynamism, variability and adaptability of human-plant interactions suggest that ethnobotanical processes be examined in ways akin to how Moran suggests resource-utilization strategies be viewed, through "...a process-oriented ecological approach that incorporates political economy and historical trajectory in its assessments of adaptive change" (Moran, 1995). In contrast, statements which automatically draw parallels between contemporary patterns of resource utilization among "uncontacted" or "isolated" groups and pre-historic populations need to be, at the very least, qualified. At another level, these questions

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problematize the scientific value of such statements as "traditional", in so far as resource utilization practices (see for example Schmink and Padoch, 1992).

Ahistorical views and representations of indigenous societies and ethnobotanical knowledge belie a naïve and powerful assumption: that cultural evolution is unilinear and directional. Europe's experience of cultural development and the emergence of modern states has been consistently and inappropriately, albeit often implicitly, used as a model with which to evaluate and judge other societies. Hunter-gatherer or agricultural societies were, and still are, seen as primitive in that their subsistence, social organization and level of technological development resemble in some aspects those of industrialized nations in the past.

This, together with the isolation of these areas from the more overt influences of industrialization and modernity, prompted the widely held view that indigenous societies have remained unchanged for thousands of years.

The notion of indigenous peoples as safe keepers of vast knowledge, and especially of medicinal plant knowledge, is a powerful image that has been used by ethnobotanists, the media, activists and indigenous leaders to advance specific agendas. Brosius (1997) for example, discusses how the media and activists have coopted and transformed ethnobotanical accounts in ways that highlight the role of medicinal plants and the knowledge that the Penan have of these resources. These representations in turn have affected how the Penan

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portray themselves. Brosius suggests that although the Penan clearly have a considerable amount of ethnobotanical knowledge, the interest and emphasis in medicinal plants is recent, and largely a political response to external representations of Penan ethnobotany,

A similar process may be taking in Madre de Dios. Thus, although in the past Ese Eja have repeatedly asserted that their ancestors "knew little about medicinal plants", this perception may be changing among some of the younger indigenous leaders. Ethnobotanical knowledge has become an important aspect of ethnic identity, and as such is entering the indigenous political discourse.

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Appendix Ese Eja Medicinal Resources

FAMILY	GENUS SPECIES, AUTHOR	SPANISH	ESE EJA	SYMPTOMS TREATED	A	B	D	F
Acanthaceae	*Sanchezia tigrina* Leonard	none reported	none reported	rheumatism[5]	[rt,ext]	I-C	Hg	MA0974
Alliaceae	*Allium cepa* L.	cebolla(b,p)	*seboto*	coughs[60]	[tu,int]	I-C	Hg	obs.
Anacardiaceae	*Anacardium occidentale* L.	cayú(p), marañón(p)	*manayo', ejajá joshi ba'e*	diarrhea,[21] skin fungal infections[23]	[lvs,bk- dr] [lvs,sd, ext]	C	Fa, Fi, Hg	MA1047
	Mangifera indica L.	mango(b,p)	*shaweyo*	coughs[24, 28]	[lvs,dr]	I-C	Fa, Fi, Hg	MA880
	Spondias venosa Mart. ex Colla, ined.	cedrillo(b), ubo(p)	*diji*	diarrhea, [24] menstrual hemmorhaging,[62] post-partum hemmorhaging[24]	[bk,dr]	W	Fo, Fa	MA0488, VP051
Apiaceae	*Eryngium foetidum* L.	culantro(b), sacha-culantro(p)	*sie-sie*	vomiting[24, 59]	[lvs,dr]	I-C	Hg	obs.
Apocynaceae	*Geissospermum reticulatum* A. H. Gentry	cafecillo(b), quina-quina(p)	*akwi pase*	fever,[57] malaria[46]	[bk,dr]	W	Fo	obs
	Himatanthus tarapotensis (K.Schum. ex Mgf.) Plumel	bellaco-caspi(p)	*akwi heemo'*	body aches[5]	[lat,ext]	W	Fa	VP109
	Tabernaemontana sp.	arco-sacha de monte(p)	none reported	skin fungal infections,[59] shingles[13,30]	[lvs,ext]	W	Fo	MA0422

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Araceae	*Dieffenbachia sp.*	patiquina(p)	*ta'a*	chronic ulcers,[38] insect bites[30,41]	[lvs,ext]	W	Fo,Fa	MA0416, VP31
	Dracontium sp.	jergón-sacha(p)	*see*	snake bite,[5,21,57] abscess[5]	[tub,ext/ dr]	W-A	Fo, Fa,Vi	VP5
	Heteropsis oblongifolia Kunth	miti(b), tamishi(p)	*picheme*	snake bite[18,21]	[lvs,ext] [rt,ext]	W	Fo	MA1136
	Philodendron exile Bunting	none reported	*ta'a iña sisi*	love charm [16a]	[lvs,ba]	W	Fo	MA0418, VP50
	Philodendron krukovii Gl.	none reported	*sokwe 'ana sisi*	love charm [16a]	[lvs,ba]	W	Fo	MA0672
	Philodendron lechlerianum Schott	itininga(p)	*baweya*	insect bites,[24] snake bite[18,21,24]	[st,ext]	W	Fo	VP30
Arecaceae	*Attalea maripa* (Aubl.)Mart.	motacusillo(b,p), shapajilla(p), almendrilla(p)	*sakaná-sopowi*	hair care[49]	[sd,ext]	W	Fo	MA1253, MA1292
	Euterpe precatoria Mart.	asaí(b), huasaí(p)	*yisa*	urinary infection, kidney ache[35]	[rt,dr]	W	Fo	MA154, MA201, MA469
	Oenocarpus bataua Mart.	májo(b), ungurahue (p)	*majo*	coughs[27]	[frt oil,dr]	W	Fo	obs
	Scheelea butyracea (Mutis ex L.f.) Karst ex	motacu(b), shapaja(p)	*hememe*	diarrhea,[49] hair care[49]	[rt,dr] [sd,ext]	W	Fo,Fa	MA982
	Socratea exorrhiza (Mart.) Wendl.	pachiuba(b) cashapona (p)	*shakaka*	skin fungus[5]	[st,ext]	W	Fo	MA364
Asteraceae	*Acmella ciliata* (H.B.K) Cass.	botoncillo(p)	*eséshijaji.*	toothache[33,62,67]	[lvs,ext]	I-C/A	Ri,Vi, Hg	MA1014
	Pseudolelephantopus spiralis (Less.) Cronquist	lengua de vaca(p)	none reported	venereal disease[22]	[rt,dr]	I-A	Vi	VP043
	Tagetes erecta L.	rosa sisa(p)	*sie-sie*	diarrhea due to "fright"/soul loss[5]	[lvs,int]	I-C	Hg	MA1012

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Asteraceae	*Vernonia patens H.B.K*	ocuera, tabaquillo, chica(p)	*chaja wawi**	conjunctivitis[24]	[st,ext]	W-A	Fo	MA973, MA1048
Bignoniaceae	*Crescentia cujete* L.	tutuma(b), tutumo(p)	*akwi tepe*	abscesses[47,66]	[frt,dr]	C	Fi,Fa, Hg	MA1106
	Mansoa alliacea (Lam.) A. H. Gentry	ajosacha(p), pusanga de gallinazo(p)	*bojóshicuiji, be'oha pusanga*	abscesses,[24] headaches[40]	[lvs,ext]	W-A	Fo,Fa	MA0688, MA1143
	Martinella obovata (H.B.K) Bureau & Schuman	yuquilla(b,p)	*jawákishi.*	conjunctivitis[24]	[tu,ext]	W-A	Fo,Fa	MA1140
	Mussatia hyacinthina (Standl.) Sandw.	chamairo(p)	*jono bikia*	diarrhea[13]	[bk,dr]	W	Fo	MA1184
	Tabebuia incana A. H. Gentry	tawarí amarillo(p), tajibo (b)	*akwi dojo tewe*	teacher plant in ayahuasca shamanism[42]	[bk,dr]	W	Fo	MA1025
	Tanaecium nocturnum (Barb.Rodr.) Bureau & Schuman	cucaracha-huasca(p)	*behe, jono shie*	love charm[24]	[lvs,ba]	W	Fo	MA1167
	Tynanthus schumannianus (O. Ktze.) A. H. Gentry	none reported	*shie-shie, jono shie*	love charm[24]	[lvs,ba]	W	Fo	MA0579
Bixaceae	*Bixa orellana L.*	urucú(b), achiote(p)	*apo'e*	conjunctivitis,[1, 24] thrush and mouth sores[11, 24, 57]	lvs,ext] [sd,ext]	C	Fa,Fi, Hg	MA988, VP177

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Bombacaceae	*Ceiba sp.*	mapajo(b), lupuna(p)	*wechi*	"teacher plant" in ayahuasca shamanism[42]	[bk,dr]	W	Fo	MA948
Burseraceae	*Protium fimbriatum* Swart	none reported	*saka'bo*	body aches, aching joints[57]	[lat,ext]	W	Fo	MA833
	Protium rhynchophyllum (Rusby) ined.	isidro(b), copal(p)	*saka'bo*	body aches, rheumatism[57]	[lat,ext]	W	Fo	MA1317
Caesalpinaceae	*Copaifera paupera* (Herzog)Dwyer	copaibo(b), copaiba(p)	*akwi na'*	cuts[48], scabies, skin sores, skin fungal infections[62]	lat,ext	W	Fo	VP02
	Senna reticulata (Willd.) I. & B.	retama(p)	none reported	calm crying babies[6]	[lvs,ba]	C	Fi,Hg	VP208
Capparidaceae	*Capparis prisca* Macbr.	nina-caspi(p)	*sosewi*	aching joints, rheumatism[34]	[bk,ext]	W	Fo	VP65
	Capparis sola Macbr.	nina-caspi(p)	*sosewi*	aching joints[19],	[bk,ext]	W	Fo	MA18, MA647, MA1125, VP056
Caricaceae	*Carica papaya* L.	papaya(b,p)	*esle*	gut parasites,[24] ear ache [71]	[flr,ext][sd, int]	C	Fi,Hg	obs.
Cecropiaceae	*Cecropia membranacea* Trécul	ambaibo(b), cetico(p)	*kaoje*	sting-ray sting,[5,8] urinary infection [8,20]	lvs,ext	W-A	Fo,Ri, Fa	MA1097
Chenopodiaceae	*Chenopodium ambrosioides* L.	caré(b), paico(p)	*sie-sie,iwi-iwi*	gut parasites,[28] skin eruptions,[24] cuts [5]	[lvs,dr] [lvs,ext]	C	Hg	obs.

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Combretaceae	*Combretum laxum* Jacq.	tambor-huasca(p)	*tamo ta'a*	panacea[34]	[frt&rt, int]	W	Fo	MA0151, MA0453, VP198
Commelinaceae	*Dichorisandra* cf. *ulei* Macbr.	piri-piri de vibora(p)	none reported	snake bite[10]	[lvs,ext/ ba]	W	Fo	MA1011, VP45
Convolvulaceae	*Ipomoea batatas* (L.) Lam.	camote(p)	*kwaeyo*	skin fungal infections[15]	[lvs,ext]	C	Fi,Hg	obs.
Costaceae	*Costus acreanus* (Loes.)Maas	caña agria(b), caña-caña colorada(p)	*po'o po'o wo'o*	skin fungal infections, sores,[13,24] fever,[24, 45] headaches[16a]	[lvs,ext]	W	Fo,Fa	VP53
	Dimerocostus strobilaceus O.Kntze ssp. *appendiculatus* Maas	caña agria(b), caña-caña blanca(p)	*po'o po'o*	fever, diarrhea[41]	[lvs,ba], [st,lvs,dr]	W-A	Fo,Fa	MA1054
Crassulaceae	*Kalanchoe pinnata* (Lam.) Pers.	hoja de burro(p), oreja de burro(p)	none reported	swellings, blows, "lisiado"[62]	[lvs,ext]	I-C	Hg	MA975
Cucurbitaceae	*Momordica charantia* L.	balsamina (b)	*dopopo, popoé*	scabies[16,55]	[lvs,ext]	A	Fi,Hg	obs
Cyperaceae	*Scleria secans* (L.) Urban	piña del monte(p)	*sachichi 'ai*	coughs[68a]	[lvs,dr]	W	Fo	MA438, MA600, MA1206
Erythroxylaceae	*Erythroxylum coca* Lam.	coca(b,p)	*koka*	fever[34, 53] diarrhea[24]	[lvs,dr]	I-C	Fi,Hg	MA1112

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Euphorbiaceae	*Croton sp.*	sangre de grada, sangre de drago	*eshápe, jata akwi*	skin fungal infections,[5] sores,[57] cuts[5, 24, 40]	[lat,ext]	W-A	Ri,Fa	obs
	Euphorbia chamaesyce L.	chanca piedra negra(p)	*sosó teteji, sosó mayaji*	botfly larva removal[38a]	[lat,ext]	A	Vi	MA1052, MA1120
	Hura crepitans L.	ochoo(b), catahua(p)	*shi'be*	snake bite, sting ray sting[5]	[la,ext]	W	Fo	obs
	Jatropha curcas L.	piñón(b), piñon blanco(p)	*wapa-wapa(b), chihíshikwiji(p)*	skin sores,[21, 28] thrush,[39, 72] fungal infections[5]	[lat,ext]	I-C	Hg	obs.
	Jatropha gossypiifolia L.	piñón(b) piñón colorado(p)	*wapa-wapa(b), chihíshikwiji(p)*	fever,[62] cuts, skin sores, thrush, fungal infections[5]	[lvs,ba], [lat,ext]	I-C	Hg	obs.
	Phyllanthus stipulatus (Raf.)Webster	chanca piedra blanca(p)	*sosó ma'yaji, soso shijaja*	"mal de riñón" (kidney aches)[24]	[lvs,dr]	A	Fi,Hg, Vi	VP100
Fabaceae	*Dipteryx alata* Vog.	almendrillo(b), shihuahuaco(p)	*mawi*	"teacher plant" in ayahuasca shamanism[22]	[bk,dr]	W	Fo	MA757
	Dipteryx micrantha Harms	almendrillo (b), shihuahuaco(p)	*mawi*	"teacher plant" in ayahuasca shamanism[22]	[bk,dr]	W	Fo	VP57
	Erythrina berteroana Urban	amasisa blanca (p)	*kwaso*	fever[24]	lvs,ba	I-C	Hg	MA1218
	Erythrina dominguezii Hassler	amasisa colorada(b)	*kwaso*	fever,[29] skin eruptions, skin fungus,[70] sting ray sting,[28] panacea[6a]	[lvs,ba] [bk,ext]	W	Fo,Ri	VP218
	Hymenaea spp.	paquiyú(b), azucar guayo(p)	*asaja*	coughs[17]	[bk,dr]	W	Fo	obs.
	Myroxylon balsamum (L.) Harms	estoraque(p)	*yohímoshicuiji*	body aches[24, 59]	[lat,ext]	W	Fo	MA830
	Tephrosia sinapou (Buc'hoz) A. Chevalier	barbasco (b,p)	*asa*	scabies[16b]	[st,ext]	W/C	Fo,Fi, Fa,Hg	MA913

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Flacourtiaceae	*Mayna odorata* Aubl.	none reported	*chihlshikuiji*	skin eruptions, skin fungal infections [30]	[lvs,ext]	W	Fo	MA0651
Gentianaceae	*Irlbachia alata* (Aubl.) Maas	habas-habas(p)	*páse-páse*	scabies [62]	[lvs,ba]	A	Fi,Fa	MA1102
Gesneriaceae	*Drymonia semicordata* (Poepp.) Wiehl.	pusanga de maquisapa(p)	*bia kia paeji*	skin fungal infections [11]	[lvs,ext]	W	Fo	MA15, MA978, MA1150, VP54
Iridaceae	*Eleutherine bulbosa* (Mill.) Urban	cebolla brava(b,p), yahuar piri-piri(p)	*seboto wo'o, eshihii iñaja*	diarrhea, dysentry [24]	[tu,dr]	I-C	Hg	MA218, VP221
Lamiaceae	*Melissa officinalis* L.	toronjil(p)	none reported	vomiting[24]	[lvs,dr]	I-C	Hg	obs.
	Ocimum micranthum Willd.	albaca(p)	*shie-shie*	fever,[8, 62] conjunctivitis[62]	[lvs,ba] [sd,ext]	I-C	Hg	MA1013
Lauraceae	*Nectandra membranacea* (Sw.) Griseb.	moena(p)	*akwi shie*	fever[24]	[lvs,ba]	W	Fo	MA126
	Persea americana Mill.	palto(b), palta(p)	*panta*	diarrhea[8,24] vomiting[43]	[lvs,bk, sd,dr]	I-C	Fa, Fi, Hg	obs
Lecythidaceae	*Bertholletia excelsa* Humb. & Bonpl.	almendra(b), castaña(b)	*shiwi jaja*	abscesses and infected cuts[4]	[lat,ext]	W	Fo	obs
	Couroupita sp.	ayahuma(p)	*jajá ewewe*	skin fungal infections[24]	[frt,ext]	W	Fo	obs.
Loranthaceae	*Phthirusa retroflexa* (R & P) Kuijt	suelda-que-suelda(p)	none reported	bruises, dislocations, fractures[24]	[lvs,ext]	W-A	Fo	MA362,VP 52
	Psittacanthus corynocephalus Eichler	suelda-que-suelda(p)	none reported	bruises, dislocations, fractures[30]	[lvs,ext]	W-A	Fo	MA0499

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Malpighiaceae	*Banisteriopsis caapi* (Spruce ex Griseb.) Morton	ayahuasca (b,p)	*jono*	hallucinogen in shamanistic divination and cure[42, 62]	[st,dr]	W/C	Fo,Fa ,Hg	DL1
	Stigmaphyllon sp.	none reported	*mahii jono*	Swellings[17]	[tub,ext]	W-A	Fa,Vi	MA1219
Malvaceae	*Gossypium barbadense* L.	algodón(b,p)	*wapehe*	diarrhea,[41] ear ache,[70] skin fungal infections,[5, 57] birth aid[5, 44]	lvs,dr] [frt,ext] [flr,ext]	C	Fa,Fi, Hg	MA1006, MA1221
	Malachra barbadense L.	malva(p)	*showé*	colds, fever[21, 29] birth aid[5, 8]	[lvs,bath] [lvs,dr]	C	Hg	MA1005
	Malvastrum coromandelianum (L)Garcke	malva(p)	*showé*	diarrhea[68] fever, colds[62]	[lvs,dr] [lvs,bath]	A	Fi,Vi	MA1207
Marantaceae	*Calathea sp.*	platanillo(p), bijao(p)	*kwi shaja*	cuts, sores[57, 72]	[lvs,ext]	W-A	Fa,Fi, Vi	MA1118
Menispermaceae	*Abuta grandifolia* (Mart.) Sandw.	para-para(p)	*yisakwi*	male aphrodisiac[24]	[lvs,dr]	W	Fo	MA691, VP47
Mimosaceae	*Acacia tenuifolia* (L.) Willd.	cari-cari(b), pashaco(p)	*saki*	diarrhea, [72] vomiting, stomach aches [68b]	[bk,dr]	W-A	Fo,Fa	VP78
	Calliandra angustifolia Spruce ex Benth.	bobinsana(p)	*shawi*	Panacea, Protection against colds [5, 19]	[rt,ba]	W	Ri	obs.
Monimiaceae	*Siparuna bifida* (Poepp. & Endl.) A.DC	none reported	*sodo'*	fever, [22] hunting charm for dogs [24]	[lvs,ba]	W	Fo	MA1186, MA1305, MA1306, MA1325
	Siparuna cuspidata (Tul.)A.DC.	palo de agua(p)	*sodo'*	colds, [21] fever [18, 57]	[lvs,ba]	W	Fo	MA1230, MA1287

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Moraceae	*Artocarpus altilis* (Park.) Fosb.	pan de arbol(p)	*shiwi jaja soaja*	bruises, swellings, fractures [5]	[lat,ext]	I-C	Fi,Hg	VP83
	Maclura tinctoria (L.) Steudel	mora(b,p)	*ki'ano*	tooth ache [13, 27]	[lat,ext]	W	Fo,Fa ,Hg	MA1314
	Ficus caballina Standl.	renaquilla, quina-quina(p)	*wipe jono*	bruises, fractures, dislocations, [8, 24, 62] body aches, rheumatism [24]	[lat,ext] [bk,ext]	W	Fo	VP128
	Ficus insipida Willd.	ojé(b,p)	*etona*	gut parasites [21, 31]	[lat,dr]	W	Fo,Ri	obs.
	Ficus killipii Standl.	renaco(p), ojé negro(p)	*etona tewe*	skin eruptions and fungal infections [8]. "teacher plant" in ayahuasca shamanism [5]	[lat,dr]	W	Fo	MA432
Musaceae	*Musa X paradisiaca* L.	plátano(b,p)	*ejawi*	thrush, mouth sores [5, 30]	[lat,ext]	C	Fi,Hg	obs.
Myristicaceae	*Iryanthera juruensis* Warb	sangre de drago del monte, cumala(p)	*chihIshikuiji*	skin sores and ulcers [18, 62] mouth sores [57]	[lat,ext]	W	Fo	MA0495
	Otoba parvifolia (Mgf.) A. H. Gentry	cumala colorada(p)	*so'wo'o, chihIshikuiji*	skin fungal infections [19] skin sores, [62] thrush, mouth sores [57]	[lat,ext]	W	Fo	MS142, MA685, VP17
	Virola peruviana (A.DC.) Warb.	cumala colorada(p)	*dana*	skin sores, cuts [18, 57, 62] thrush, mouth sores [57]	[lat,ext]	W	Fo	MA45, MA276, MA407, MA959

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Myrtaceae	*Calyptranthes densiflora* Poeppig ex O.Berg	yayo(p)	none reported	"teacher plant" in ayahuasca shamanism [5]	[lvs,ba]	W	Fo	MA1160
	Psidium guajava L.	guayaba(b,p)	*esajo*	diarrhea, [8, 30, 32, 70] conjunctivitis [8, 70]	[lvs&frt,dr] [lvs,ext]	C	Fa,Fi, Hg	obs.
Phytollaceae	*Gallesia integrifolia* (Spreng.) Harms	ajo-ajo(b,p), ajosquiro(p)	*yopa*	to counter sorcery and bad luck [24]	[bk,ba]	W-A	Fo,Fa	MA0406, VP25
	Petiveria alliacea L.	sacha-ajos(p)	*asha*	"saladera" (bad luck, jinx), fever [28]	[rt,ext]	W-A	Fo,Fa	MA1144
Piperaceae	*Peperomia sp.*	none reported	none reported	panacea for children [26a]	[lvs,ext]	W	Fo	MA1261
	Piper asterotrichum C.DC.	none reported	*biashi(sp?)*	relief of blackfly & mosquito bite [41]	[lvs,ext]	W	Fo	MA0611
	Piper callosum R. & P.	guayusa(p)	*meshljeeyo*	fever [41, 50, 67] coughs, colds [25]	[lvs,ba]	W-A	Fo,Fa ,Fi	MA1039, MA1252
	Piper hispidum Sw.	matico(p)	*hawawa*	cuts and sores [26, 57] fever, colds [26]	[lvs,ex] [lvs,ba]	W	Fa,Fi	VP039
	Piper lanceolatum R. & P.	none reported	*jono shie*	love charm [26]	[lvs,ext]	W	Fo	MA0620
	Piper longifolium R. & P.	matico(p)	*hawawa*	fever [26]	[lvs,ba]	W-A	Fo,Fa	VP32
	Piper peltatum L.	sipo-sipo(b), santamaría (p)	*kwi'o shaja 'ai*	abscesses, swelling [20, 41] conjunctivitis [5, 54] to aid toddlers sleep [5]	[lvs,ext] [st,ext]	A	Fi,Fa, Vi	VP27
	Piper sp.1	none reported	*shepapa*	panacea [26]	[lvs,ba]	W	Fo	MA0604
	Piper sp.2	caripé(b)	*iñawewa wishiaji*	hunting charm for dogs [47]	[lvs,int]	W	Fo	MA1128

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Poaceae	*Cymbopogon citratus* (DC.)Stapf	paja cedrón(b), hierba luisa(p)	*loisa iña*	coughs, fever [21, 28]	[lvs,dr] [lvs,ba]	I-C	Hg	obs
	Oryza sativa L.	arroz(b,p)	*anoso*	diarrhea, skin eruptions [17]	[frt,dr] frt,ext]	I-C	Fi	obs.
Polygonaceae	*Triplaris americana* L.	palo santo(b), tangarana colorada(p)	*biñani*	diarrhea [24]	[bk,dr]	W	Fo,Fa	MA21, MA286
	Triplaris poeppigiana Wedd.	palo santo(b), tangarana negra (p)	*biñani*	diarrhea [24]	[bk,dr]	W	Fo	MA583, MA863
Portulacaceae	*Portulaca oleracea* L.	verdologa, orina de dios(p)	*diosja wiyiya*	fever [37]	[lvs,ba]	I-A	Fi,Vi, Hg	VP4
	Talinium paniculatum (Jacq.)Gaertn.	none reported	*tona-tona*	swellings, abscesses [4a]	[lvs,ext]	A	Fi,Vi	MA1214, MA1323
Rubiaceae	*Calycophyllum* aff. *spruceanum* (Benth.)Hook	guayabochi (b),capirona (p)	*majo sewe, nawa nlshi*	cuts [13]	[bk,ba,ext]	W	Fo	VP215
	Genipa americana L.	manzana(b), huito(p)	*akwisho, kwikwisho*	female contraceptive [5, 12]	[sd,dr]	W/C	Fa,Fi, Hg	obs
	Psychotria viridis R. & P.	chacruna (b,p)	none reported	admixture for ayahuasca allucinogen [62]	[lvs,dr]	W	Fo	MA1127
	Randia armata (Swartz.) DC. var. *aramata*	huitillo(p)	*sewiwi*	fever [18]	[lvs,ba]	W	Fo	MA413
	Uncaria sp.	uña de gato(b,p)	*akwisha sewiwi*	"mal de riñón" (kidney ache) [5]	[st,int]	W	Fo	MA1191, VP217

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Rutaceae	*Citrus aurantifolia* (Christm.) Swingle	limón(b,p)	*nimo'*	diarrhea, dysentry, [5] stomachache, [13, 24] colds [8] headache, [28] fever, [5, 28] earache, [52] buns, [8] vaginal discharge [5, 52]	[frt,dr,ext]	I-C	Fa,Fi, Hg	obs.
	Citrus sinensis L. (Osbeck)	naranja(b,p)	*nanaja*	fever, [8] diarrhea, drunk for sorrow [5]	[lvs,flr,dr] [bk,dr] [lvs,dr]	I-C	Fi,Fa, Hg	obs
	Zanthoxyllum sprucei Engler	limoncillo(p)	*joakwa*	cuts and wounds [7, 57]	[bk,ext]	W	Fo,Fa	MA1037, VP46
Salicaceae	*Salix humboldtiana* Willd.	sauce(b,p)	*esiikwiji, besiikwiji*	diarrhea, fever [5]	[lvs,dr], [bk,ba]	W	Ri	MA1095
Sapindaceae	*Paullinia alata* (R. & P.) G. Don	abuta colorada(p)	none reported	cuts, wounds [5, 51]	[st,ext]	W	Fo,Fa	MA1046
	Paullinia bracteosa Radlk.	abuta colorada(p)	none reported	cuts, sores [5, 51]	[st,ext]	W	Fo,Fa	MA253, MA568, MA900
Scrophulariaceae	*Scoparia dulcis* L.	nucñu pichana(p)	*tee-nee, eteekwiaji*	stomach ache, gut cramps [36, 41]	[lvs,ext/ ba]	W-A	Hg	obs.

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Solanaceae	*Capsicum chinense* Jacq.	aji(b,p)	none reported	menstrual and post-partum hemmorhaging [34]	[lvs,dr]	C	Fi,Hg	MA1216
	Datura suaveolens Humb. & Bonpl.	flor de tohe, tohe (p)	none reported	headache [1, 8]	[lvs,ext]	I-C	Hg	MA1007,
	Nicotiana tabacum L.	tabaco(b,p)	*shawano, tamako*	colds and flu [41], snake bite [62], "teacher plant" in ayahuasca shamanism [62]	[lvs,int]	I-C	Hg	obs.
	Physalis angulata L.	mullaca(p)	*shimomo*	fever, [29] scabies [26a, 40, 16]	[lvs,ba]	A	Fi,Fa, Vi	MA920, MA1324, VP28
	Solanum caricaefolium Rusby	mata-chacarero(p)	*popoi*	scabies, [18, 24], stomach ache, [67] destroy damaged teeth [34]	[lvs,ext] [lvs,frt,dr	A	Fi,Fa, Vi	MA1020, VP38
Sterculiaceae	*Theobroma cacao* L.	cacao(b,p)	*kwahe*	birth aid [48, 65, 69]	[bk,dr]	W/C	Fo	MA459, MA843, MA958, MA1060
Ulmaceae	*Trema micrantha* (L.) Blume	piricho(b), chubil(b), atadijo(p)	*somi*	abortive [8, 34]	[lvs,dr]	W-A	Fa	VP62
Urticaceae	*Urera caracasana* (Jacq.)Gaud. ex Griseb.	pica-pica(b), ishanga(p)	*shapóna*	fever [24, 72] panacea [72]	[lvs,ba]	W-A	Fo,Fa	MA967, MA1241
Verbenaceae	*Stachytarpheta cayennensis* (L.C.Rich.)Vahl	rabo de ratón(p)	*bahuicho hua'o*	fever [29, 64] sting ray sting [3]	[lvs,ext]	A	Fa,Vi	MA1215

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Viscaceae	*Phoradendron* aff. *bathyoryctum* Eichler	suelda-que-suelda(p)	none reported	bruises, dislocations, fractures[24]	[lvs,ext]	W-A	Fo	MA0500, VP075
Vitaceae	*Vitex sp.*	tarumá(b), aceituno(p)	*kijeshi*	diarrhea [58]	[bk,dr]	W/C	Fo,Hg	MA1193
Zingiberaceae	*Curcuma longa* L.	guisador(p), palillo(p)	*hawa-hawa*	measles[34]	[tu,ext]	I-C	Hg	obs.
	Zingiber officinale Rosc.	ajijiño(b), jengibre(b,p), ajengibre, quión(p)	none reported	stomach ache, diarrhea,[24, 41, 67] aching joints [24]	[tu,int] [tu,ext]	I-C	Hg	VP194
Fern	*Adiantum latifolium* Lam.	sorrapilla(p)	*shashai*	dysentry, stomachache[24] cuts [5]	[lvs,dr] [lvs,ext]	W	Fo	MA1050
	Lomariopsis sp.	yarinilla del monte(p)	*shashai*	diarrhea [5]	[rt,dr]	W	Fo	VP123

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Appendix: Notes

1. (b) refers to the spanish name in Bolivia, (p) in Peru.

2. Symptoms are listed in English. Superscript numbers refer to the citation in which the same use has been documented for the same genus, and in some cases species. Authors are listed in numerical order below.

3. **Column A:** Plant parts used and the mode of administration.
A comma (,) between plant parts means that either or both plant parts may be used. The use of the symbol "&" between plant parts means both plant parts are used together. The following abbreviations are used for plant tissues.

bk: Bark
fl: Flower.
frt" Fruit. Includes exocarp and/or mesocarp.
lat: Exudates. Includes latexes and resins.
lvs: Leaves
rt: Roots
sd: Seeds
st: Stem (includes pith)
tu: Storage organs: includes rhizomes, tubers and corms

The following abbreviations are used for modes of administration.

ba: Baths.
dr: Preparation drunk.
ext: Other external application, e.g. poultices, compresses, rubbing directly
int: Other internal administration, e.g. inhaled, enema

4. **Column B:** Management status of species

A: Agrestic
C: Cultivated
I: Introduced
W: Wild

5. **Column C:** Habitat where resource is most commonly collected

Fa: Fallow
Fi: Field
Fo: Forest
Hg: Home garden
Ri; Riparian

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Vi: Village

6. **Column E:** Botanical collection Number.

MA: Miguel Alexiades collection numbers.
VP: Victor Pesha collection numbers.
Obs. Field determination.

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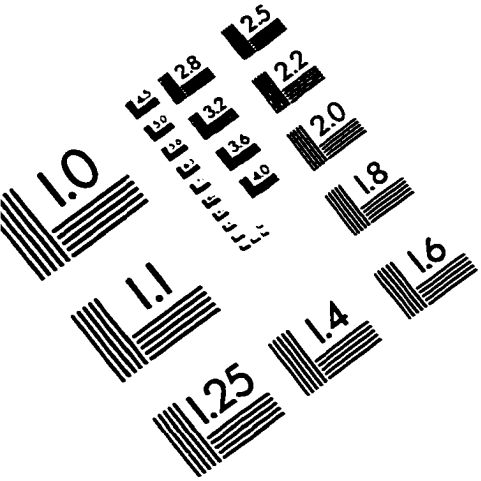

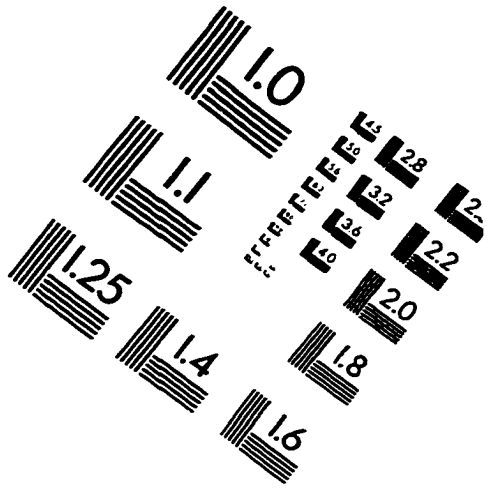

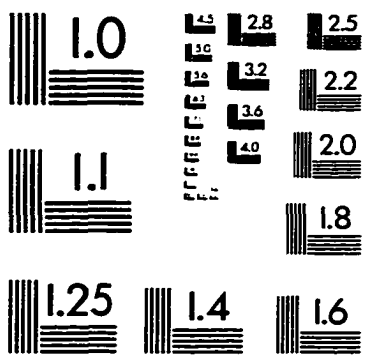

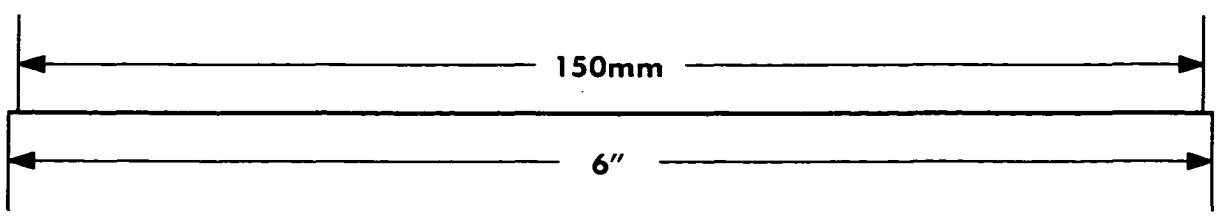

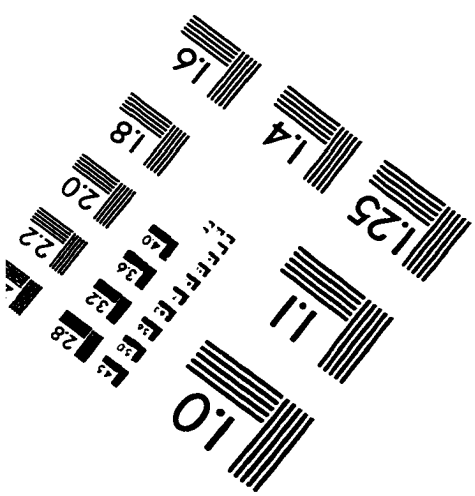

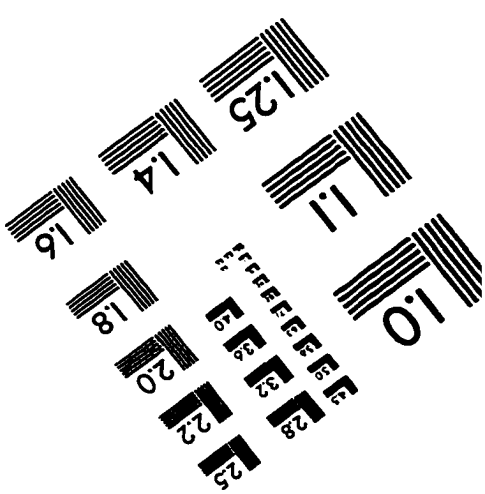

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