This is to certify that the

thesis entitled

"And Never the Twain Shall Meet: A Study of Research and Policy on Coca Chewing in Peru."

presented by

Ruth Eugenia Scott

has been accepted towards fulfillment
of the requirements for

Master's degree in Anthropology

Arthur J. Rubel
Major professor

Date 5/2/79

AND NEVER THE TWAIN SHALL MEET: A STUDY OF RESEARCH AND POLICY ON COCA CHEWING IN PERU

By

Ruth Eugenia Scott

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Anthropology

1979

ABSTRACT

AND NEVER THE TWAIN SHALL MEET: A STUDY OF RESEARCH AND POLICY ON COCA CHEWING IN PERU

By

Ruth Eugenia Scott

This thesis examines complex relations between research and policy formation concerning the use of the coca leaf among the indigenous Quechua population of Peru. A major argument of the thesis is that governmental policy reflects certain types of interests and is justified by selective use of the available research. A second argument is that research findings are affected by the sources of funding, biases and values of the researchers. International intervention is also examined for its impact on policy and research.

The development of the debate on coca chewing is traced through available historical materials, and a sociology of knowledge approach is employed to provide an understanding of past and present attitudes toward coca use. The views of the national government and the indigenous population continue to be in conflict on the coca issue. To date, the peasant perspective on coca chewing has been largely neglected.

ACKNOWLEDGEMENTS

The writing of a thesis is an opportunity for tremendous growth, both personal and academic. This thesis is largely the product of library research, but many people have contributed greatly to its formulation, organization and completion. I am indebted to many people for their encouragement, criticism and understanding during the course of this work.

To the chairman of my committee, Dr. Arthur J. Rubel, I owe many thanks for much time spent in discussing and clarifying my initial research problem and the final conclusions. Dr. Scott Whiteford, my other committee member, was of invaluable help in all the most vital moments, and provided the critical perspective necessary to the creation of a cognizant thesis. To them both I am grateful for allowing me to follow my interests fully, and the flexibility to help me develop the ideas and arguments in this thesis.

I very gratefully acknowledge the time and inspiration provided by Dr. Joseph Spielberg, and his unfailing support of my topic and perspective.

Dr. David Dwyer has provided interesting insights and criticisms of this work, and I thank him for his support and curiosity.

I would also like to thank Dr. Robert Hahn for his critical reading and his constant encouragement of this effort.

Dr. Duane Metzger and Dr. Christine von Glascoe, of the University of California at Irvine, provided the initial spark for this thesis, through their research and encouragement. With their help, I spent two months in Peru, in the Fall of 1978, sponsored by a grant from the InterAmerican Foundation. To the Foundation, I am also sincerely grateful.

While in Peru, many people were of tremendous help to me and to all of them I am indebted. I am especially indebted to Ernesto Vargas P. for his unfailing inspiration and support in the field and his tremendous insight into Peruvian society. Dr. Marco Ugarte provided a much needed critical perspective on policy-making and coca chewing, and a much valued friendship. Dr. Luis and Marta Davila and their children provided me with the warmth and comfort of a family throughout my stay in Cusco. To all of these people I am profoundly grateful.

I owe a tremendous debt to Christopher Edick for his patience, support and intellectual stimulation throughout my graduate career.

My greatest debt, however, is to my family for their love and encouragement, sharing all the joys and difficulties of my life.

The support and encouragement of faculty, friends and family is so important to continued intellectual searching and so often goes unthanked. I consider myself fortunate to be so greatly indebted, to so many.

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

This thesis will examine the complex issue of coca chewing in Peru. It will focus primarily on the interrelationship of governmental policy and existing research on the effects of coca chewing. A major premise of this thesis is that governmental policy reflects certain types of interests, and is justified by selective use of the available research. This thesis will examine past and present governmental policy and attempt to clarify the forces which influence its formulation. Various factors also influence research orientation and conclusions, such as source of funding, and intellectual training of the researcher, and these factors will be analyzed.

The chewing of coca leaves (*Erythroxylon coca*) affects the lives of several million inhabitants of the Andean region (90% of the Indian population chews coca). Coca chewing is said to be a work aid for the Indians, giving them strength, and staving off hunger and thirst (Burchard 1976, von Glascoe et al. 1976, Lobb 1974). Coca is attributed medicinal and spiritual powers by the indigenous population (Gagliano 1976, Lobb 1974). The chewing of the coca leaf has been the center of debate in Peru since the Conquest (Gagliano 1963).

The debate on the effects (phsyiological, psychological and cultural) of coca chewing provides the framework for an examination of the interrelationship of policy and research. The purpose of this thesis is not to decide the complex issue of whether coca chewing is detrimental or beneficial to the consumer or the nation, but to emphasize the complexity of the debate surrounding the issue of the effects of coca chewing. The biomedical research cited in this thesis is examined not to prove whether coca chewing is detrimental or beneficial to peasant health but rather to illustrate that the whole issue is highly inflammable and that the debate continues despite the fact that policy has already been decided on what is claimed to be scientific, indisputable evidence (Ricketts 1954: 125).

This paper will begin with a historical overview of the evolution of policy and attitudes toward coca chewing from the Conquest to the present. Following this, the research on coca use will be outlined and evaluated, particularly in regard to its impact on policy formulation. Critical analysis will illustrate the shortcomings of current research and policy. It will also demonstrate the neglect of Indian attitudes toward coca chewing and its importance in their lives. This all too frequent lack of awareness of the functions of indigenous systems of symbols, integration and interaction has been at the root of numerous failures in policy designed to affect positively Indian life (Davies 1974, Donahue 1978). Finally, this thesis

will conclude with suggestions for necessary future research on coca use, and a statement of the need for further integration of research findings and policy development.

THEORETICAL PERSPECTIVE

This thesis will, in part, utilize the theoretical perspective of the sociology of knowledge, as it will illustrate that intellectual and scientific endeavors are in large part determined by existing problems or social issues and general intellectual orientations. This will be illustrated by examples of selective funding and application of research.

Social policy is not created in a vacuum, and does not represent rational, empirical wisdom. It is, in fact, developed from a subjective assessment of existing data, and often policy is based on partial, highly selective information. The "truths" of a society are rooted in the historical and social situation from which they are derived and, therefore, their context must be carefully examined.

> "Men do not confront the objects of the world from the abstract levels of a contemplating mind as such, nor do they do so exclusively as solitary beings. On the contrary they act with and against one another in diversely organized groups, and while doing so think with and against one another" (Mannheim [1929-1931] 1954: 3).

This thesis will examine the groups (political, economic and social) significant to the formulation of

both research and policy on coca leaf chewing, both national and international. The ongoing debate between these factions will be outlined.

The controversial nature of the research examined lends itself to analysis utilizing the theoretical perspective of the sociology of knowledge. Striving for a critical analysis of the policy-making process

> "involves the tracing of the bases of social judgements to their specific interest-bound roots in society, through which the particularity and hence the limitations of each view will become apparent" (Mannheim 1936: xxvi).

A sequential analysis of policy at given historical periods clarifies the situations which give rise to particular modes of thought and attitudes. The issues of ethnocentrism, class and racial discrimination must be delineated and discussed as important factors in the molding of societal attitudes and consequent policy-making action.

Research that has been done on coca chewing in Latin America, due to the established social order, has been carried out by the dominant sector, or ladinos. This fact complicates the issue of objectivity of the researcher in contributing scientifically "pure" empirical research. Coca is perceived in Peru as an Indian drug and carries with it the stigma of ethnic prejudice. The "Indian Problem" in Peru is a complex, sensitive issue, complicated by prejudices, biases and strong economic and poliical vested interests which will be examined below.

Within the scientific community of researchers, biases and prejudices exist despite the frequent claim of "objectivity" (cf. U.N. report, 1950). A discussion of the areas of controversy which make up the debate on the "coca problem" will not provide a solution to the problem, but will provide a more realistic perspective:

> "It is not to be assumed that the mere revelation of these divergent angles of vision will automatically cause the antagonists to embrace one another's conceptions or that it will result immediately in universal harmony. But the clarification of the sources of these differences would seem to be precondition for any sort of awareness on the part of each observer of the limitations of his own view and at least the partial validity of the views of others. While this does not necessarily involve the holdings of one's interests in abeyance, it does make possible at least a working agreement on what the facts in an issue are, and on a limited set of conclusions to be drawn from them" (Mannheim 1936: xxvi).

The controversy surrounding coca chewing lacks definition of the problem, or any established "facts", clearly proven facts about coca chewing. It has been variously perceived as a "health problem", a stumbling block to modernization, an obstacle to the assimilation of the Indian, and as an international "drug problem." Burchard discusses these various definitions of coca chewing and the mythology which surrounds them.

> "There can be little doubt, as Fabrega and Manning (1972:247) point out, that much of the research on coca leaf has in fact been motivated by 'essentially correctional intentions stemming from a preoccupation with the plants' active ingredient', or at least, what is widely believed to be such, i.e., cocaine. It is also clear, however that just as some researchers are so preoccupied with the fact

> that coca leaf is the source of cocaine alkaloids, other researchers have been preoccupied with trying to avoid the subject completely. Neither position has taken us too far beyond the sixteenth century in our understanding of the significance of coca leaf in highland peasant culture in Peru. In fact, as I shall argue, in many cases both positions have institutionalized more myths of the 'sacred' leaf than they have clarified" (Burchard 1976: 6-7).

Ideally, scientific research seeks to remain objective, and to avoid the polemics of politics and economics. But rarely is this ideal achieved (Taussig 1978: 119), and as Burchard describes, the research on coca chewing reflects the biases of the researchers. As Mannheim explains (Coser 1968: 430), "all knowledge, all ideas, although to different degrees, are 'bound to a location' within the social structure and the historical process."

CHAPTER I

THE DEBATE IN PERU

THE "COCA PROBLEM"

Coca has been condemned as detrimental to the national goal of assimilation of the highland indigenous population. And conversely, coca has been glorified as a major factor mitigating against the disappearance of the highland Indians, the victims of harsh high altitude living conditions (Gagliano 1976, Grinspoon and Bakalar 1976). Coca has been viewed as contributing to the marginality of the highland Indians, and as their salvation.

The pharmacological and behavioral effects of coca chewing are, therefore, the object of much debate and the subject of substantial research. The United Nations Commission of Enquiry of the Coca Leaf advised, in 1950, a gradual phasing out of the production and sale of the coca leaf over a twenty-five year period. The Peruvian and Bolivian governments opposed this plan for some years. Recently, however, in 1962, they accepted the Commission's recommendation (Grinspoon and Bakalar 1976). Complex economic, social and political factors are involved in this decision. These will be explored in depth in an

attempt to discover the framework used in the formulation of public policy on coca chewing.

THE "INDIAN PROBLEM"

The research theories presented on coca chewing reflect the bias of an upper sector of Peruvian society (the highly educated scientists and physicians) toward the indigenous population. Policy, in turn, reflects the bias of yet another upper sector, that of the politicians and lobbyists. They do not represent empirical research, removed from time and place. When research professes to be "unbiased" and to provide "the" answer to a problem, then social scientists must draw back and cautiously assess the situation. For though no group can completely transcend its "location", social science can strive for the most unified perspective attainable, always aware of the dangers of simplistic explanation.

> "The very fact that each thinker is affiliated with particular groups in society--that he occupies a certain status and enacts certain social roles--colors his intellectual outlook" (Coser 1968: 430).

The ladino society in Peru has long cultivated its privileged position. The institutionalization of the encomienda system assured the upper classes of their power position by taking away the Indian land base, and hence their livelihood, and creating a dependency situation which despite the Agrarian Reform of 1968, remains a major issue in Peru today (Guillet 1978). Gamonalismo, as Mariategui, an outspoken indigenista and Peruvian

socialist reformer of the early 1900's, called it, was a form of parasitism, the rich living off the labor of the poor and giving next to nothing in return. This inequity has been nurtured since the Conquest, with little concern for the Indian population itself, or legislation concerning them.

The indigenous population has always represented a problem to the administrators of Peru. Davies, in *Indian Integration in Peru,* outlines the problems and solutions which have been perceived in the period from 1900-1948. The work illustrates the perpetual attempt to assimilate the Indian population. This population, largely isolated geographically, socially, economically and linguistically from the ruling sector of Peruvian society, has alternately been ignored, exploited and the subject of various attempts at integration from education programs to religious conversion. But as Mariategui argued early in the century, and as many continue to argue today (Stavenhagen 1975), lack of land is the most critical issue and no real structural change or improvement in sierra conditions will occur until extensive land reform has been enacted (Behrhorst 1976). But the obstacles to land reform are numerous and complex (see Guillet 1978).*

---

*For a more detailed discussion of the myriad socio-economic problems facing the indigenous populations of Latin America, see Behrhorst 1975, Donahue 1978, Guillet 1978.

There are various conceptualizations of the "Indian Problem", however, each perceiving a different cause.

> "Most political leaders and many indigenista writers felt that one or more reforms within the society would result in the immediate integration of the Indian population. Simon Bolivar's panacea was to transform the Indian into a yeoman farmer. Others such as Manuel Pardo, Oscar Benavides, and Manual Prado viewed Indian education programs as the answer. Augusto B. Leguia, Benavides, and Fernando Belaunde Terry argued that improved transportation and communication systems would bring Indian integration, while still others held that military service would break down barriers. Some reformers maintained that the solution lay in ending coca and alcohol addiction and generally improving health and sanitation facilities among the Indians" (Davies 1970: 161).

Politicians and policy-makers have in the past tried to conceptualize the social ills, prejudices and inequities suffered by the Indian population as a single issue, one problem that needed to be addressed, rather than the multi-faceted problem that it is, demanding many solutions (Davies 1970: 160). Coca chewing represents one aspect of the "Indian Problem." By choosing to see coca chewing as the source of the social ills of the Indian population, politicians and policy-makers allow themselves to concentrate on a problem that seems more manageable, more easily addressed than the major issue of land reform or correcting an exploitative social system.

The issue of coca chewing clearly illustrates the class conflict apparent in Peru (Ugarte 1978). In dealing with drug studies, one aspect the researcher must remain aware of is the sensitivity of the issue, the attitudes and

biases which are attached to drug policy. Grinspoon and Bakalar discuss this problem in terms of cocaine and cannabis in the United States; their words of caution are also applicable to the case of coca in Peru.

> "With other drugs, as with cannabis, the problem is often the attitude of those who do not use the drug toward those who do. . . .The point is that such attitudes have never been based on anything as naively obvious as a dispassionate examination of the physiological and psychological effects of the various substances" (1976: 240).

Thus in Peru, the ladino attitudes toward Indians in general must be analyzed before a real understanding of the policy on coca, its relationship to research, and political connotations can be understood. For as the analysis in this thesis demonstrates, the research is not as one-sided as the policy. There are important factors which have caused policy-makers to selectively utilize available research. For prohibitionary policy to be created, the detrimental research has been focused on and the positive findings minimized.

In my opinion and that of others (Burchard 1976, Davies 1974, Ugarte 1978), prejudice and racism have played a large part in influencing research and the creation of policy. Recognition of the fear of Indian revolt among ladinos and their contempt of the Indian and "Indianness" is very important to the understanding of government policy and attitudes toward coca chewing.

> "We have written of drug abuse in general and cocaine abuse in particular as though they were at least potentially clearly conceived

> problems with common sense answers. Even so, we have been unable to avoid repeated hints that the drug problem may be a misconception, that to center one's interest on drugs, drug users, and the prevention of drug use is to mislocate the issues, and that even those who worry most about drugs are often really concerned about something else. . . .The real issue is often not the chemical substances but blacks, of hippies, or the Establishment, or musical preferences, or sexual habits, or attitudes toward work" (Grinspoon and Bakalar 1976: 239).

Applied to Peru and coca, the real problem seems to be what to do with the indigenous population. The problem of coca chewing is only one aspect of a much larger problem of national unity. Viewed from a sociology of knowledge perspective, and having traced the historical formation of the "coca problem", the interconnections between ideas and situation become clear.

The lack of the Indian perspective on the coca issue and in the policy-making demonstrates the one-sidedness of research and policy in Peru. A single perspective on a subject is often a dangerous vantage point if equity and social justice are the end goals. But very often in societies which maintain a dependent sector and an elite sector, we must not assume social justice as an ultimate goal. Bodley, in *Victims of Progress*, discusses the ethnocentrism evident in the economic development program created by British planners for the Azande of the Sudan. He describes its creation as follows:

> "Outsiders applied their own ethnocentric judgements on what should constitute progress, prosperity, decency, and amenities, and then proceeded to impose this blueprint on a totally different culture, assuming that the noble ends justified the apparently drastic means" (1975: 137).

And as is unfortunately often the case where indigenous groups are concerned, "of course, no one thought of consulting the Azande themselves" (1975: 135). Policy-makers assume a great deal when legislating and planning for indigenous people, because the people themselves rarely have any access to political powers; judgments are made for them, using a foreign cultural program, morality and often incredible ethnocentrism.

Indigenista stances on coca chewing have tended to be divided into reformers and defenders. Coca chewing has been attacked by Marxist thinkers among others, as a tool of subjugation and exploitation (Ugarte 1978), maintaining the indigenous population in a state of intoxication or stupor, which prevents them from fomenting revolution (Mariategui 1959: 27). Anthropologists and social scientists have defended coca chewing as an important indigenous custom which should not be stamped out because of white or ladino values and attitudes to the contrary. But the Indian perspective is lacking. Without this perspective, policy becomes the vehicle of ethnocentrism, racism and consequently policies are often doomed to failure (Davies 1974: 161). Until the government finds out what the Indians perceive to be their problems and possible solutions, they will continue to fail (Donahue 1978).

This thesis does not address the vast area of possible solutions to the problems of Indian integration and national unity in Peru. But it hopes to provide a more productive

perspective from which to view the problems of the indigenous population and particularly one aspect of the "Indian Problem", that of coca chewing.

CHAPTER II

HISTORICAL PERSPECTIVE

This chapter will provide a historical perspective on coca use, attitudes toward it, and the formation of policy concerning coca chewing. Grinspoon and Bakalar (1976) have commented, in their major work on cocaine, on the serious lack of scientific information, and the ignorance and apprehension on which public and scientific beliefs are based:

> "The most extensive work on the botany, ethnography, and medicinal uses of the coca leaf was published in 1901; the most important medical and psychiatric studies of cocaine abuse were made in the 1920's; most work done on the effects of coca leaf chewing on mood and behavior was done in the 1940's" (Grinspoon and Bakalar 1976: 3).

Consequently, it is crucial to gain an understanding of attitudes toward coca chewing in the past, when most of the research on which present scientific knowledge and policy is based was carried out. Public opinion and scientific knowledge are constantly changing. Paradigms are set up and discredited, and certain myths are popular and then fall out of favor. Burchard (1976) discusses the "Myths of the Sacred Leaf", referring to all the misinformation and biased research surrounding the "coca problem."

A historical perspective allows one to see the basis of the prejudices and attitudes toward coca chewing and policy concerning it.

The "coca problem", it must be emphasized, is only one part of a much larger problem which has concerned administrators since the Conquest. The "Indian Problem", the problem of what to do with the millions of indigenous inhabitants of Peru, has been a major subject of policy debates (Davies 1974). There have been various approaches and successive "solutions" throughout the centuries (Service 1955). As will be demonstrated in this historical review, the Indians have been alternately viewed as a potential labor force, souls for the Catholic Church, subjects for domination and taxation, and the symbol of Peru's glorious past and strength as a nation.

The attitudes toward the Indians have gone through many changes from the Conquest to the present. And with these changes in attitude came related changes in attitudes toward coca and its uses, the "Indian" drug (Grinspoon and Bakalar 1976: 221). Various forces, economic, political and social, affect and create these attitudes and opinions on the "Indian Problem" and, within that context, the "coca problem."

Controversy has surrounded coca chewing since the Spaniards first came to the highlands. Prohibitionists and defenders of coca chewing have argued its dangers and virtues for centuries. The controversy has continued unabated through the present.

EARLY USE OF COCA

Pre-Incaic Period

Evidence of coca use has been documented from as early as the late Preceramic Period on the south central coast of Peru (the site of Asia I, radiocarbon dated 1314±100 B.C.). Remains of coca leaves and lime have been found in burial sites along with other articles of ritual significance and daily use, i.e., jewelry, baskets, textiles (Lanning 1967: 72, 74).

Incaic Period

During the Incaic Period the use of coca continued. The Inca Empire was complex and highly stratified. The Inca and nobility were urban dwellers, and these cities became the centers of power. Rural areas were carefully controlled; villages were created and linked with the urban centers. The Inca system of roads stretching across Peru facilitated the movement of crops and goods throughout the Empire. In times of famine, stricken areas could be sent goods and foods from other productive areas, thus maintaining the welfare of the Empire (Cieza de Leon 1959: 261-263).

The role coca played in Inca life was manifold. The use of coca was limited to the nobility, according to most early reports (Jose de Acosta, 1874). The Inca religion required the use of coca leaves in almost every ritual, to be offered to the gods and thrown to the four corners

of the earth (Mortimer 1901: 53). Inca religion believed the Sun to be the elder brother of the Inca. The Sun was the ruler of the heavens, as the Inca was the ruler of the Earth. The Sun was a creation symbol as it represented growth, birth and life.

> "It was in this same spirit that coca was considered as the divine plant, because it was the means of force and strength as well as a stimulant to reproduction" (Mortimer 1901: 56).

The powers of coca were recognized in its curative role. It was taken as an infusion for stomach ailments, used as a poultice in skin ulcers. It is believed that coca was used to drug patients during operations such as trepanning and amputation (Baudin 1961: 165; de Acosta 1894: 381).

Coca played an integral part in religious rituals. Offerings of coca were made to the idols and gods, along with chicha, a ritual alcoholic drink made from fermented corn.

> "Coca was the divine plant, the sacred leaf of their gods, of the sun, the offering in their sacrifices. It was burned at the fiestas accompanying death, and dedicated to the deities (*auquis*) of the mountain tops, of the rapid streams of the hill, and of the rocks. There was no sacred ceremony without the sacrifice of coca" (Bues 1935: 7).

The nobility carried small pouches filled with the coca leaves and lime as a symbol of manhood and strength. During the ceremony of knighthood, after successfully completing the events, each youth was presented with his pouch and coca (Mortimer 1901: 70). Coca was also used in divining

rites and rituals of the dead of the nobility. Coca bags were laid across the deceased body to give strength and ease the crossing into the otherworld.

Coca was generally forbidden for common use, but a gift of coca was sometimes given as a reward for acts of bravery or good citizenry (Jose de Acosta, 1570). The cultivation and production of coca was controlled by the nobility on "cocales", or plantations owned by the Inca State (Cieza de Leon 1959: 259-260). Coca was grown in the lush tropical climate of the montana region, but during the time of the Inca and their sophisticated system of roads and transportation, coca was transported throughout the Empire.

> "Within a given region, there was a smoothly functioning trade between different ecological zones: fish for farm produce, high altitude crops for low. Some plant and animal products traveled farther. Coca was traded from the montana to the highlands and coast cotton moved uphill, alpaca wool moved downhill" (Lanning 1967: 186).

Conquest and Colonial Period

The Conquest caused vast changes in every aspect of Indian life: the social structure, labor systems, religious practices--everything felt the impact of a new and dominant culture. The Spanish conquerors were interested in creating a productive, efficient colony in Peru. Their interests did not often take into account the existing culture of the Inca. Land, precious metals, and a vast source of cheap labor were foremost in the minds of

the conquerors. The policies and laws created during the Conquest and early colonization reflect these priorities (Davies 1974).

The Incas had developed a communal landholding system around the "ayllu", generally defined, a plot of land worked communally by an extended family group (Baudin 1961: 46). The Spanish conquest completely interrupted the indigenous structure of life. Indians became forced labor in mines and in the fields. The Spanish concept of private land ownership resulted in the creation of institutions such as the "encomienda" and later the "hacienda" (Service 1955).

The attitude of the Spanish conquerors toward the Indians was to view them as another resource to be exploited. And the labor systems they created clearly displayed their lack of interest in Indian rights or culture. Land represented to the Indians not only their livelihood but was in itself sacred; by usurping the land, the Spaniards undermined the Inca social system.

With this disruption of food production and the political and religious authority of the Inca came an increase in the use of the coca leaf (Gagliano 1963: 43). The status of coca changed with the changes caused by the Spanish in Incaic society. The breakdown of the Inca religious restrictions and the state restriction of coca for the nobility allowed coca to become available to the general populace (Grinspoon and Bakalar 1976: 10).

The use of coca by the workers in the mines and on the plantations of the conquerors was encouraged by the

owners. The value of coca as a stimulant to hard work was recognized early by the enterprising Spaniards. Pedro de Cieza de Leon, an early chronicler of highland life, marveled at the ability of coca to stimulate the Indians to labor for hours without food or drink (1959: 259-260). The granting of encomiendas in 1534 as payment to the conquistadors granted a certain amount of land and the use of the Indians on that land to the recipient. In return for the Indians' services, the owner was obliged to care for the spiritual well-being of the Indians. This system resulted in such widespread abuse of the Indians and decimation of their population that it was phased out with the death of the original beneficiaries (Van Den Berghe 1977: 41). But in the meantime, Indians suffered from such hardships, overwork, malnourishment and spiritual oppression that coca became a mainstay of their diet. In the ensuing debate over coca use, the strongest lobbyists for the coca cause were the mine owners and plantation owners. Coca helped sustain their workers, allowing long periods of work. And the Indians would often accept coca as payment for producing gold and precious metals, which astonished the Spaniards (Zarate 1555: 15, as cited in Gagliano 1975: 50).

The Catholic Church, a power in colonial politics, was divided in its opinion of coca use. The primary purpose of the Church in Peru was the conversion of the Indians to Catholics; therefore, their spiritual well-being was of utmost importance. One faction of the Church

felt that coca perpetuated pagan attitudes and rituals. Because of the religious significance of coca to the Indians, it was viewed by this faction of the Church as a severe impediment to Christianization. Coca was also feared to have been linked with the devil, because of its use in witchcraft and sorcery rituals. Thus, some factions of the Church felt that coca use must be outlawed and petitioned the Crown for destruction of the coca plantations (Arriaga 1968, Gagliano 1963).

Other missionaries recognized the Indians' need for coca as a stimulant and nutrient due to their impoverished social conditions. But they criticized the conditions under which the Indians were forced to work on the coca plantations. Disease was rampant in the lowland areas and the overworked, underfed Indian workers succumbed at appalling rates.

> "Bartolome de las Casas, who never visited Peru, was one of the first to take up the cause of the camayos (workers). Although he did not wish to see coca prohibited, since the miners relied on it as stimulant, he appealed for an improvement in the working conditions of the camayos. With his usual hyperbole, he asserted that there never had been a pestilence which killed more people than had died in the cultivation of coca. Censuring the enormity of human waste, other humanitarians placed the annual death rate as being between one-third and one-half the total number of laborers in Andes Province" (Gagliano 1963: 45).

The labor systems in practice during the Colonial Period illustrate the attitude toward Indians at that time. The Indians were useful to produce wealth for the conquerors.

> "By the seventeenth century, the ravages of diseases became more localized and less sweeping Nevertheless, depredations, exactions and epidemics continued to deplete the population of colonial America through the eighteenth century, and letters and reports from the viceroys to Spain continuously lamented that 'se estan acabando los indios' (the indians are being finished off). Spanish colonialism is best characterized as plunder rather than exploitation" (Van Den Berghe 1977: 37).

Laws such as the "Laws of the Indies" were passed for the protection of the Indian, but the Crown had no way of enforcing its laws in such a distant land.

> "The humanitarian laws regulating the treatment of natives were not actually hypocritical, as they have so often been judged, but they were politically expedient and intended to be effective. It might also be added that Indians were viewed by the Crown as a 'natural resource' which it was important to protect by conservation measures rather than allow them to be destroyed by shortsighted exploitation" (Service 1955: 415).

The Crown made its long deliberated statement on coca use in 1569. The King of Spain, Philip II, decreed that coca should be maintained as a source of payment/stimulant for hard work but that its use in pagan rites and superstitious practices should be discouraged (Gagliano 1963: 50). Thus, the Crown recognized the economic value of coca and yet sought to pacify the clergy by encouraging their Christianization efforts against paganism.

Factions of the secular Church, according to Grinspoon and Bakalar (1976)

> "eventually found it possible to condone the cultivation of coca while outlawing its religious uses; taxes on coca actually provided the sixteenth century bishops and canons of Cuzco with much of their revenue" (1976: 10).

Republican Period

> "Spanish attempts to deal with the Indian population were politically, economically, and legally distinct from those of the republican era. Measures developed to maintain colonial status were different from those formulated by an independent nation seeking to unite itself" (Davies 1974: ix).

Peru declared independence from Spain in 1821. The colonial years were ended, but for the Indian, a pawn of the colonial system, independence was an empty word. Change did occur in republican Peru, but it was chaotic and confused. Governmental strategy concerning the Indian population was superficially liberal and aimed at integration, but the legislation was poorly implemented (Davies 1974: 19).

The first leaders of Peru after Independence were anxious to destroy the colonial systems of exploitation. San Martin and Bolivar were influenced by the independence movements in other parts of the world, i.e., the French Revolution, and adopted the foreign strategies of human rights and equality. Bolivar abolished the "Indian tributes", a source of substantial revenue for the government in colonial times. The "mita" and the "encomienda" were both abolished. But Peruvian society was not ready for these radical measures; the economy could not withstand the loss of the "Indian tribute", and it was reinstated and abolished alternately throughout the nineteenth century in Peru. But attempts continued to end feudalism and to establish an economy which included the Indian as a participant rather than a vassal.

> "These decrees were liberal, even radical, but they were not obeyed. Most members of Peruvian society had been reluctant to end colonial rule and certainly were not prepared to relinquish exploitation of the Indians. Since San Martin's government lacked the means to enforce its decrees, the state of the Indian remained unaltered" (Davies 1974: 20).

In the above quote is stated the central problem of the republican period. Although the legislation was created, there was no enforcement of it, no implementation of the paper ideals. The situation of the Indian, in fact, may be seen to worsen during this period (Van Den Berghe 1977). Bolivar, in his eagerness to abolish feudalistic systems, dissolved the Indian "comunidades", on the grounds that they were interfering with the productivity of Indian agriculture, and that the Indians deserved to own private plots of individual land. Hacendados were quick to steal the Indian lands by obtaining the deeds or by other trickery which the Indians, unfamiliar with the concept of private ownership, failed to comprehend. This Western ideal, imposed on a population to whom it was completely foreign, resulted in the loss of the Indian land base and a further reduction of their power. This lack of understanding of Indian needs, complicated by governmental chaos, was to continue through the 1900's (Davies 1974: 19).

During the eighteenth century, interest in coca began to increase. Colonization was occurring throughout the Third World during this period, and many nations were searching for ways to ease the discomfort of the colonizers and to increase the productivity of the natives through the

use of drugs to combat tropical diseases. The history of quinine, used in the treatment of malaria, parallels the excitement over coca and its possible uses (see Vietmeyer 1978).

The recognition of the medicinal value of coca was slow, due to the extreme racial prejudice toward anything Indian in colonial Peru, the unpleasant taste of coca, and the fear of its pagan associations (Garcilaso de la Vega, El Inca [1941-46], II: 56-59). But during the eighteenth century, European botanists, travelers, and entrepreneurs braved the Andes of Peru and began to report on the remarkable powers of coca.

Coca was ascribed various curative qualities and was recommended as a tonic for longevity, a cure for toothaches and caffeine addictions, and a remedy for melancholia. An Italian physician, Paolo Mantegazza, wrote glowing reports of coca as "the true treasure of the New World" (Gagliano 1975: 58). Thus, coca gained importance in Peru as an export commodity, and became increasingly more acceptable among white society.

The nineteenth century brought an important discovery concerning coca. In 1859, Niemann succeeded in the isolation of cocaine from coca leaves (Burchard 1976: 55). This discovery had a profound impact on subsequent research and policy concerning coca chewing. During the nineteenth century, cocaine was heralded as a panacea, the "wonder drug" of the century (Grinspoon and Bakalar 1976: 35-36).

In 1884, Karl Koller introduced the use of cocaine as a new form of anesthesia. The topical application of cocaine revolutionized ophthalmology, and provided a local anesthetic which allowed the patient to remain awake for delicate surgery but feel no pain. Cocaine was quickly adopted for many kinds of surgery (Grinspoon and Bakalar 1976: 23).

During the nineteenth century coca and cocaine became available to the public in many forms: cigarettes, alcoholic beverages, sprays and injections. One of the most popular medicines of all time was a wine of distilled coca distributed by Angelo Mariani, and called "Vin Mariani." It was considered a health tonic, a cure-all, taken by such famous figures as Thomas Edison, U. S. Grant, the Czar of Russia and Pope Leo XIII. Another famous drink which began from coca is the ubiquitous Coca-Cola. Invented by a chemist from Georgia, Coca-Cola was first marketed as a medicine and sold in drugstores at the soda fountain as:

> "a headache remedy and stimulant that contained the 'wonder drug' of those years, coca, as its main active principle. Pemberton had registered a trademark for a brew he called 'French Wine of Coca, Ideal Tonic', possibly in imitation of Mariani, in 1885. In 1886, he removed the alcohol, added kola nut extract (which contains caffeine) and some citrus oils for flavor, renamed the product and began to advertise it as 'the intellectual beverage and temperance drink.' In 1888 he replaced ordinary water with soda water, which was already associated with mineral springs and health" (Grinspoon and Bakalar 1976: 28).

The cocaine content of Coca-Cola was replaced with caffeine, and only coca flavoroids, free of any traces of cocaine, were being used by the time the Pure Food and

Drug Act was passed in 1906. This Act marked a change in public sentiment and scientific knowledge, in regard to cocaine and coca.

Cocaine had proven useful as a topical anesthetic, but new, safer drugs had since been found and were becoming more and more popular. Freud's experimentation with cocaine in the treatment of morphine addiction had failed, and caused great medical concern in Europe and the United States. Suspicions as to harmful effects of cocaine and coca began to increase. By the turn of the twentieth century, the popularity of coca and cocaine, in Europe and the U.S., as a "wonder drug" had passed.

By 1914, both coca and cocaine could only be obtained by prescription and importers of the drug were registered with the government in the United States. Medical study became much more rigorous, and physicians began to demand closer regulation of pharmaceuticals (Flexner report 1910).

Pressure was put on Europe to create similar laws regulating the possession and use of coca and cocaine. Since the 1914 Harrison Act, penalties for possession and use of cocaine have continued to increase, and both drugs continue to be included in the narcotics category, although this is much disputed (Grinspoon and Bakalar 1976: 40-43).

Peru, during the height of popularity of coca and cocaine abroad, was occupied with exporting the coca leaf and seeking new uses for coca. Peru established a Commission for this purpose in the 1880's and its recommendation was to emphasize the usefulness of coca as a stimulant for

factory workers, miners, and laborers (Gagliano 1975: 60). Despite the growing polemics in Europe and the United States, many Peruvian scientists still felt that coca was the most beneficial medicine for the people. In 1901, W. Golden Mortimer published his monumental work on the "Divine Plant of the Inca", in which he defends the curative powers of coca. A United States physician, Mortimer aimed his work at encouraging the use of coca among his U.S. medical colleagues. But the sentiment toward coca and cocaine had already shifted to concern and rapidly to disapproval of the two drugs.

Late Republican Period

The 1900's in Peru brought a shift in economic power to the coast. The coast, with its large industrialized plantations of sugar and cotton, began to reap the benefits of its export potential. The highland hacendados began to lose their firm grip on the power system and the government was faced with the rising political consciousness of the wage labor force on the coast. Social reform became an issue discussed in government circles, and with this renewed concern for the masses came a renewed interest in Indian reforms.

President Eduardo Lopez de Romana, president during the transition period (1899-1903), demonstrated, however, that concern does not translate into understanding of the problems of the Indian in the early 1900's.

> "His messages to Congress made few references to the Indians; when he did mention them, he demonstrated a complete failure to understand their problems. In 1900, he attacked the evils of alcohol and the debilitating effects it had on a large portion of the population. The high incidence of Indian alcoholism was cited, with no indication that Lopez de Romana realized why Indian alcoholism was so prevalent" (Davies 1974: 44).

This governmental concern with the superficial aspects of Indian problems has continued into the twentieth century. Symptoms of oppression such as alcoholism, coca chewing, and poor hygiene have been cited and studied as the cause of the Indians' depressed state (Gutierrez-Noriega 1953, Zapata Ortiz 1970). The debate over coca chewing during the colonial period begins again in the late republican period and becomes progressively more heated in the twentieth century. The status of coca during the 1800's reflects its export value when it was widely accepted as the "wonder drug" of the West. As exports declined after World War II, and the international drug laws began to stiffen, coca became more and more the center of debate among physicians and policy-makers in Peru.

Public sentiment in Peru began to change in the early twentieth century. The Indian became the focus of social reform and increased attempts at assimilation (Davies 1974: 140). The classification of cocaine as a narcotic by the Western powers, and the international concern over the possible addictive qualities of the coca leaf, contributed to Peruvian debate. Coca began to be viewed as a real "social" problem, and a grave one. One of the earliest

activists in the Indigenista movement, Hermilio Valdizan, condemned the use of coca. He felt that

> "the use of coca was the gravest sociomedical problem of the Andes. The coca habit not only enhanced the cultural isolation of the highland Indians, preventing their assimilation into national life, but also led to racial degeneration, he insisted. He urged governmental action as rapidly as possible to prohibit the cultivation and consumption of coca" (Gagliano 1975: 60).

Thus, once again in the history of Peru, the eradication of coca chewing had become a prominent issue, as it had been during the Conquest period. Coca chewing was once again perceived as a "problem" in Peru and, now, internationally.

During the twentieth century, the controversy over coca chewing has reached full strength. Encouraged by international concern and pressure, members of the Peruvian medical profession, particularly, began to lobby for legislation to control coca production and restrict its use (Gagliano 1975: 60).

During the 1930's in Peru, Indian problems were not a national priority. The government was facing a major opponent in the form of APRA, an influential political group, strongly interested in the indigenista movement. The nation, caught in an economic slump, was besieged by political strife and struggling to maintain order. The 1940's brought an economic boom during the war years, and a lessening of political strife and hatreds. Thus, once again, the nation had time to return to the problems of integrating the indigenous sector. Manuel Prado, in power during this more peaceful period, supported a platform of

immediate Indian integration. He believed that education was the solution.

> "Prado believed adult education especially important and used Benavides Brigades de Culturazacion Indigena to promote it. Each brigade was to be composed of two normal school teachers (one man and one woman), one agricultural and stock-raising instructor, and a nurse, all of whom had to have degrees. In addition, an auto mechanic was to accompany each brigade. Prado sent brigades to Cuzco, Puno, Ayachucho, Junin and Cajamarca to teach adult Indians Peruvian history, Spanish, and improved agricultural methods. The brigades also offered classes in hygiene, food preparation, rudimentary law, and prevention of alcoholism and overuse of coca" (Davies 1974: 131).

During this period, research on coca began to increase. Carlos Ricketts, Luis Saenz and Carlos Paz Soldan were a few of the early critics of coca use and radical lobbyists for the eradication of coca. Through their efforts and increased international intervention, in 1949, a national Coca Monopoly was created to monitor and tax the cultivation and production of coca (Legislative Decree No. 11046). Production was to be restricted to medical needs and the ultimate goal was the eradication of coca cultivation during a twenty-five year period (U.N. report, 1950).

The efforts of the above researchers also contributed to the cooperation of Peru with the United Nations Economic and Social Council when, in 1950, they sent a Commission of Enquiry to research the coca problem and facilitate the U.N. in making recommendations toward the solution of the coca problem.

Another strongly outspoken critic of the use of coca was Carlos Gutierrez-Noriega. His research, along with

that of his colleague, Zapata Ortiz, on the psychological and physiological effects of coca, has contributed greatly to the formulation of policy on coca in Peru. The controversy over coca chewing became so heated in 1948 that Gutierrez-Noriega lost his position at the University of Lima after describing the use of coca as a food substitute as a "collective crime" and lambasting the producers of coca for their ruthless exploitation of the misery of the Indians, for their own personal gain (Grinspoon and Bakalar 1976: 12). In the same year, Gutierrez-Noriega, Ricketts and Saenz named coca as the "greatest obstacle to the improvement of the Indian's health and social condition" at the Second Indianist Congress in Cuzco (Grinspoon and Bakalar 1976: 219). Coca had come to be viewed as the cause of the poverty, suffering and isolation of the highland population by the coca critics.

As passionately as the coca critics argued, there continued to be others who maintained that coca was important culturally and medically to the highland Indians, and felt that the indigenous custom must be preserved. When in 1950 the U. N. Commission of Enquiry on the Coca Leaf determined that "coca-leaf chewing leads to genuinely harmful, closely related economic and social effects in both Peru and Bolivia" (U.N. 1950: 59), and recommended the gradual phasing out of the custom over the next twenty-five years, a Peruvian Commission for the Study of Coca Problem was formed to provide contrary evidence and a

rebuttal to the recommendations of the U. N. Commission (Lapeyre 1952: 24-130). Initially, the Peruvian government supported the indigenous commission, but under continued international pressure, Peru signed the Single Convention on Narcot Drugs in 1961, agreeing to the eradication of coca chewing and the majority of coca plantations within twenty-five years.

This decision has been hotly debated for many reasons. The Coca Monopoly (Estanco de la Coca), created in 1949 to control coca production distribution and taxation, reported that roughly 200,000 people would be unemployed as a result of the abolition decreed by the United Nations. Other sources of tax revenue would have to be sought and substitute crops provided (Estanco de la Coca 1962: 10).

The National Institute of Andean Biology has contributed to the debate. The Institute, set up

> "for the purpose of making a study of the Andean population and a physiological and pharmacological survey of coca within the biological framework, thus adopting a scientific approach to the study of the effects of mastication on the human body" (Estanco de la Coca 1962: 10),

was headed by Dr. Carlos Monge. Monge suggested that the highland population was perhaps biologically unique, the "Andean Man" hypothesis, and that coca chewing might be contributory to the successful adaptation of the sierra Indians to their hostile environment (Monge 1952: 14).

The Peruvian Government's acceptance of the Single Convention's position (1961) on coca chewing triggered skepticism and concern among many scientific circles and

other interest groups. Since the 1960's there has been an increase in research concerning coca use. This recent research will be examined in depth in the following chapter, devoted to the analysis of research on the effects of coca chewing.

A major force in the acceptance of the Single Convention position by the Peruvian government was international intervention and pressure. Because of Peru's unstable economic situation and tremendous national debt, it is extremely vulnerable to international economic and political pressures. Davies (1974: ix) points out that the year 1948 marked the beginning of significant international aid and influence in Peru. In 1948, when Manuel Odria established military rule, the Indian ceased to be viewed as a domestic problem, but rather became the focus of a worldwide attempt to assimilate indigenous populations.

According to Bodley (1975: 135), a worldwide campaign for rapid economic growth was initiated after World War II. Development experts were sent to underdeveloped areas in an effort to raise their economic production levels. Special emphasis was given to assimilation efforts.

> "'Backward' cultures were considered to be major obstacles to national and international economic goals. Elaborate programs were devised to bring unwilling tribal peoples fully into national economies, to further raise their agricultural productivity and per-capita cash incomes, and to promote whatever socioeconomic transformations deemed necessary to achieve these goals" (Bodley 1975: 125).

Coca chewing had been chosen by the Western world as one of the most significant problems of the indigenous

population in Peru. In 1948, the U. N. began preparations for their tour of Peru and consultation on the coca problem. The Peruvian government also began to welcome foreign aid in general, and the Cornell Vicos Project was also established to help solve the ills of rural Peru. But despite this international attention, the Odria government, like the 120 years of governments before it, failed to really address the problems of the sierra population; they remained poverty-stricken, exploited, and far from the mainstream of Peruvian society (Davies 1974: 155).

The majority of Peru's governments have focused their attention and efforts at modernization and Westernization, on creating industry and improving conditions in the coastal areas. Many promises have been made to address the problems of the indigenous people, but little real action has been taken. According to Davies' interpretation:

> "Aside from opportunistic proposals and demagoguery, the Indian integration record for the first century and a half of independence is poor. Though political parties incorporated Indian planks into their platforms and politicians climbed on the indigenista bandwagon, few of those in policy-making positions were sincere. Moreover, those leaders who did demonstrate some commitment to Indian reform were unable to effect lasting change, owing to several factors which hampered the implementation of Indian legislation" (Davies 1974: 159-160).

Various governments did design Indian legislation, as cited above, but they have consistently failed to understand the enormity of the needs of the highland population. The government has always been centered in Lima, with little or no representation in the provinces. Hence, even

when legislation is created, there is no governmental force to enforce in the highlands. This combination of lack of enforcement and distance from the central government has again and again conspired to allow for corruption and ignorance of new measures to subvert any efforts made to solve the problems of highland Peru.

The eradication of coca chewing appears to have become an issue symbolizing modernization and Westernization for the government of Peru and international interests. Governmental and business interests concerning coca have gone through various transitions described above since the time of the Conquest. But for the Indian, coca remains above all a work aid, something to stave off hunger (von Glascoe et al. 1976). Despite the fluctuations in ladino or Western research to the contrary or in support of this, the Indian response to why they chew coca has remained consistent. For the indigenous people it remains a remedy for many ailments, hunger, cold, fatigue and illness. But it is a pacifier for these ills, not a cure. And it is for this cure that the indigenistas, government of Peru and international aid agencies should be searching, not expending energy and resources on eradicating a mere symptom of a much larger disease, an exploitative and inequitable social system that has persisted for centuries.

The eradication of coca does not represent the solution to the "Indian Problem" any more than education, communication, land reform or health programs individually represent an answer (Behrhorst 1975). To grasp only one

corner of a large and nebulous problem and hope for change through legislation, policy or enforcement is a self-defeating approach. The real challenge lies in a reconceptualization of the problem in its full complexity, and a striving for solutions which will shake the existent social structure to its foundations. Land tenure, reorganization of the social structure, medical facilities, education are all problems which must be addressed simultaneously for any substantial change to occur. And the Indians' perceptions of their problems must be taken into account, rather than blindly imposing Western values, perceived needs or solutions. For the Peruvian Indian, there is no "coca problem"; there is social inequality, lack of land, poverty and, always, those who fail to recognize the complexity of the Indian situation: the elite, the policy-makers.

Revolution: Contemporary Period

In 1968, a military coup upset the social structure of Peru. The new revolutionary regime professed to end idle promises and make changes, real changes, by instituting Agrarian Reform, increased educational measures, and establishment of a government aimed at creating solutions for the problems of the masses of Peru. The days of the oligarchy were over (Fitzgerald 1976). The new social structure created since 1968 merits examination.

The social structure of modern Peru bears the marks of years of domination of the masses by the few. Many

forms of domination established in the colonial period continue into modern times. The wealthy and powerful continue to be located in the urban centers, and the coast remains the center of *criollo* culture, the remnants of Spanish culture transposed during colonization. The highlands remain in many respects isolated physically, culturally and economically from the national culture. An urban-based elite controls the government and the wealth of the nation. This urban concentration of technology, wealth and power has induced extensive rural to urban migration in the last decades, and Peruvian cities continue to burgeon.

The oligarchy, recently displaced in the military coup of 1968, formed the top of a pyramidal social structure with the peasants forming the large base and a small middle class serving as intermediaries between the oligarchy and the peasants. The peasant population displays varying degrees of "Indian" traits, specifically monolingualism in a native language, traditional dress, occupation (farmer), coca chewing (Van Den Berghe 1976: 117).* The mestizo class emulate more the aspirations and habits of the wealthy or elite through their ties with the wealthy landowning sector of society. Another category which is discussed in the literature on social stratification (see

---

*The definition of "Indian" is a highly controversial subject. Many researchers feel that it must be conceived of in terms of traits ranging on a continuum from more traditional to mestizo. For a more complete discussion of the issues involved in defining "Indian", see Van Den Berghe (1976: 117).

Bourque 1971, Uzzell 1974) is that of "cholo", an ambiguous term often negative in connotation, used to describe someone who exists in a category somewhere between Indian and mestizo. The process of cholification as discussed by Bourque (1971: 22-23) is:

> "a process of social mobilization at the upper limits of the peasantry in which the peasants located at this echelon through literacy, knowledge of Spanish, new occupations and new market relations begin to participate in the dominant society, in a strata that falls between the Indian and the mestizo."

The patron-client system is endemic in Peru: the forming of relationships between members of a lower and higher class for the purpose of establishing vertical alliances maintains the existing social structure. *Compadrazco* is said to perpetuate the lack of horizontal ties by encouraging vertical information flow and atomizing the social relations at the base of the pyramid (Long 1977: 77).

In discussions of the social stratification of Peru, many variables are pinpointed as the cause of the inequitable system of social relations. Topographical elements are often cited as influential. The sharp opposition of coast and sierra can partly be explained by the lack of communications. Some social scientists have come to view the underdevelopment of the highlands as a problem of disarticulation and have called for the integration of the hinterland population as the solution. But more recently others have criticized this dualistic interpretation and

have examined structural dependency more closely.

> "In contrast to the concept of a dualistic society which is defined by reference to its internal disarticulation, a plural society is defined in terms of a specific mode of articulation whose fundamental character is imprinted by the persistence of pre-industrial types of domination" (Fuenzalida and Alberti, as cited in Long 1977: 255).

Matos Mar is another contributor to this structural dependency interpretation of society.

> "Matos rejects the commonplace dualistic interpretation of underdevelopment. He argues that the rural-agricultural and urban-industrial sectors cannot be regarded as separate, opposed structures or social systems for they are mutually related to one another in a complex web of relationships. He proposes instead to use the concept of 'plural' society. This concept he believes emphasizes both the 'singularity' of Peruvian society, its unique history and persisting cultures, while also giving attention to the patterns of inequality and dependence which have emerged as a result of its incorporation into a wider system of international relations of an economic and political nature" (Long 1977: 255).

This complex web of relationships which join together the social structures is described by Fernando Fuenzalida by a class-based model similar to that accepted by the military regime now in power.

> "a tree-like branching system in which the units of each subordinate level are connected to one another through the mediation of a superior level (instancia). One finds an extremely centralized mode of articulation, in which the different power levels gradually assume greater capacity for decision making, control greater numbers of goods, and bring together more information as they approach the top. In the resulting structure, the lower levels are atomized, while the core levels (focus superiores) are inserted in a world system of mediation. The society is characterized by the predominant development of

> vertical communication, the atrophy, impoverishment, or absence of horizontal communication, and the excluding mediation without alternatives: it is a dominated or dependent society" (Fuenzalida 1970: 66-67, as cited in Guillet 1978: 2).

In 1968 with the takeover of the military junta, the existing social system was attacked and a major attempt at redistribution of wealth was launched. One of the initial assaults was made clear by Velasco in his announcement of the Agrarian Reform law in 1969.

> "Today, the day of the Indian, the day of the Peasant, the Revolutionary Government is making the best of all tributes to him by giving the whole nation a law which will end forever an unjust social order. . . .Today Peru has a government determined to achieve the development of the country by the final destruction of ancient economic and social structures that have no validity in our epoch" (Bourque and Palmer 1975: 179).

The Agrarian Reform law has met with heavy criticism since that lauded decree. The military has been reprimanded for its continued separation of political mobility from economic mobility. The Agrarian Reform was designed to integrate the peasant masses, to increase productivity and create a national market of consumers (Jaquette 1971: 222). The existing social structure stands, however, largely unchanged. The lack of a strongly developed revolutionary ideology, as in Cuba for instance, has been decried. The social structure has not altered sufficiently to allow for political mobilization of the peasant masses (Fitzgerald 1976: 97).

> "In 1963, Richard Patch described the AP-DC agrarian reform bill as the 'creation of an ideal system in which behavior is almost irrelevant.' The similarity with the Military's Agrarian Reform law is not accidental. Both are products of middle class technocratic thinking. The technical legitimization of the junta's reforms hides a very real fear of mobilization" (Jaquette 1971: 225).

The policy-making process remains out of the reach of peasant organizations. Reforms have been legislated without consulting those groups who will be most affected. The military continues to support controlled change, and solutions to major problems such as the Agrarian Reform continue to be imposed from above rather than allowing the peasants significant input in the policy-making process.

The government's solution of forming cooperatives which are created and regulated by the government pushes aside the voluntary peasant groups which formed prior to the military takeover. Rather than take advantage of this popular mobilization, the government has chosen to undermine it, coopt peasant leaders and establish government controlled organizations (Guillet 1978: 22; Jaquette 1971: 250).

The military government continues to eschew revolutionary rhetoric and to voice concern for the redistribution of land and wealth. But despite attempted changes, the continuities in the social structure are strong. Social goals continue to be sacrificed to productivity. Though land and power have changed hands, they remain out of peasant control. Guillet analyzes the impact of Agrarian

Reform in the government "showplace" of Pampa de Anta and reports the following:

> "Several reasons may be found to account for the continuities apparent in the social structure. First, the newly created producer's cooperative incorporated all of the major haciendas in the Pampa. In one sense, the replacement of several landholdings with several owners by one landholding with one owner--the cooperative--contributes to a more top heavy distribution pattern. It has not increased the land available to the small scale peasant. One could argue, as does the government, that the cooperative scheme spreads benefits in more subtle ways than simple redistribution of land. This is simply not the case as we have seen" (Guillet 1978: 26-27).

Thus, in terms of policy formulation, the peasant population remains divorced from the decision-making process. The military persists in concentrating on economic mobilization hoping to incorporate the peasant sector economically while ignoring or discouraging political mobilization.

> "The informal rules of the game are still clientelistic. The style of the regime has not been altered to that of a mobilization system nor, for that matter, to a true competitive pluralist system which would imply the existence of autonomous popular organizations participating in the policymaking process" "Jaquette 1971: 223).

The military has refocused concern over the "Indian Problem", a problem which has plagued Peru since the Conquest. By choosing a class perspective, the government has submerged the problems of the Indian into the problems of the agrarian sector as a whole.

> "One of the first rhetorical shifts of the military was to ban all references to 'Indian' in official discourse and legislation and to decree a reorganization of recognized 'peasant' communities (as opposed to the 'indigenous' community of prior legislation). The shift in government rhetoric is in line with the essentially class based view of Peruvian society held by the military" (Guillet 1978: 23).

The "Indian" has been incorporated into the agrarian peasant sector. The government will now focus its attention on peasant problems. But Indian or peasant, the perspective of this agrarian sector continues to be suppressed.

Contemporary Coca Policy in Peru

Because of the existing social structure and political and economic situation (described above) of Peru, international agencies continue to have a strong influence in contemporary policy concerning the use of coca. Since 1948, under Odria, when international intervention was encouraged and the U. N. Commission was invited to Peru, the U. N. has been instrumental in formulating eradication policy. Peru, due to its economic instability, is in a position of subjugation to the international powers. United States concern over rising multi-drug abuse, particularly involving cocaine, is tremendous (Grinspoon and Bakalar 1976: 170). Drug enforcement expenditures rise every year, and the U.S. has a very clear vested interest in stopping the production and sale of the coca leaf, the raw source of cocaine.

The International Narcotics Control Board has been an active party in the outlawing of coca chewing. The increase in drug abuse in the United States in recent years (International Narcotics Control Board 1973: 51) has generated concern sufficient to merit strong recommendations to source countries, and carefully designed programs of curtailment of production of raw narcotics, such as the coca leaf and the opium poppy. The recent rise in multi-drug abuse has provoked increased concern for the rapid elimination of availability of illicit narcotics.

> "In a number of countries private as well as official organizations have addressed themselves to particular aspects of the problem. On the world plane increased attention has been focused on the role of the United Nations' organs and other international bodies in the campaign against drug abuse. Intensified operations against the illicit traffic have achieved striking successes, often by national preventive forces acting cojointly with those of other countries. There has also been progress in concerted measures directed towards reducing raw materials, and governments are showing an increasing readiness to work together for this purpose in alliance with international organs. Scientific research, impressive both in scale and variety, is proceeding in several countries" (Report of the International Narcotics Control Board 1972: 51).

Peru and Bolivia, the major producers of the coca leaf, are, however, not a part of this concerted effort.

> "The situation in regard to these substances (coca leaf and cocaine) has undergone little marked change during the year and regrettably nothing has occurred to moderate international concern which is felt in regard to the extensive coca bush cultivation in the Andean region, especially in Bolivia and Peru. This concern rests firstly on the consumption of coca leaves by the inhabitants of

> the provinces where the bush is grown and adjoining areas, and secondly on the scope which the present overproduction offers the clandestine manufacture of cocaine and export into illicit channels" (Report of the International Narcotics Control Board 1972: 55).

The Control Board justifies its recommendations, citing the plight of the coca chewer, on "humanitarian grounds."

> "The debilitating, often demoralizing, effects of excessive coca leaf chewing, coupled with the fact that the practice is not infrequently associated with alcoholism, make it essential on broad humanitarian grounds alone that organized cultivation of the coca bush should be terminated as soon as possible. But this need acquires additional sharpness and urgency from the fact that the present over-production provides material for clandestine manufacture of cocaine to supply the illicit traffic. This outflow has expanded in recent times and present indications are that it will continue to grow in volume as cocaine becomes more and more a feature of multi-drug abuse" (Report of the International Narcotics Control Board 1972: 55).

The Board is basing its recommendations on research done prior to 1950, when the Report of the Commission of Enquiry on the Coca Leaf (1950) was established. At that time, Peru contested the findings and established its own Commission to investigate coca chewing, headed by Dr. Carlos Monge. But in 1962 Peru conceded its position, signing the Single Convention Treaty, which states the twenty-five year eradication plan (Commission on Narcotic Drugs 1963: 42). During the 1960's and 1970's research has accumulated which stresses the positive value of coca chewing, disputing the research of earlier years on which U. N. and Peruvian policy continues to be based (for

discussion see next chapter; Burchard 1976, Montesinos 1965, Bolton 1976).

Thus, the assumptions of "the debilitating, often demoralizing effects of excessive coca leaf chewing" need to be reexamined in light of recent research, rather than blanketly accepted as the basis for future or continuing policy concerning the coca leaf.

Although the international organizations for narcotics control generally recognize the environmental and economic hardships which exist in coca chewing areas, they persist in viewing coca chewing as the primary factor in peasant ill-health and economic insecurity. The INCB recognizes that coca chewing

> "is also a concomitant of poverty and under-nourishment and, considered from this standpoint, its elimination can hardly be looked for in advance of major economic and social reforms on a wide scale--reforms which would also have to take account of such periodic natural disasters as earthquakes and drought" (Report of the International Narcotics Control Board 1972: 55).

It must be recognized that the chief concern of these agencies is the suppression or reduction of the illicit use of narcotics both in Peru and in the United States. The illicit use of cocaine in the U.S. has increased in recent years despite negotiations with Peru and Bolivia to reduce production through the U. N. and other narcotics control agencies (Grinspoon and Bakalar 1976, R.I.N.C.B. 1972).

In 1977, the Peruvian government was discussing measures to prohibit the sale of coca leaves below 8,000 ft. (Duane Metzger, personal communication). In February

of 1978, the Peruvian government passed further legislation aimed at rapid eradication of cultivation and prohibiting any new cultivation of national lands (Ley de Represion del Trafico Illcito de Drogas, 1978). Thus, Peru remains committed to the reduction of coca production and coca chewing. The revolutionary government has instituted educational programs stressing the detrimental effects of coca chewing and other health issues (Tullis 1970: 9n). The large investment of time and money in the coca issue by international organizations and inquiries and Peruvian officials perhaps requires reassessment in light of recent research which supports the value of coca chewing. As has frequently happened with drug issues (Grinspoon and Bakalar 1976, Helmer 1975), the emotionality of the subject may have subsumed the initial concern with peasant welfare. In fact, the funds for drug control might better more profitably be applied to more pressing socio-economic problems such as rural health care systems, improved nutrition, peasant labor laws or agrarian reform.

The biomedical research currently available on coca chewing will be reviewed in the following chapter. The repressive policy presently directed at coca chewing should be considered in the light of the findings of this recent research.

SUMMARY

This historical overview has provided a framework in which the current research and policy on coca can be

analyzed. It has illustrated the ever-present debate on coca chewing, its effects and value or detriment to the population and other interest groups. And the role of coca as an integral part of another larger question, that of the "Indian Problem" in Peru, has been established.

By tracing the coca chewing debate from its origins in the time of the Conquest, we can follow the logic, prejudices and biases of some of the arguments which continue to be voiced today. A historical perspective illustrates the complexity of the coca issue, its development as a perceived "social problem", and the interest groups which have created the coca "problem."

CHAPTER III

BIOMEDICAL RESEARCH ON COCA CHEWING

INTRODUCTION

The pharmacological and behavioral effects of coca chewing continue to be the subject of much debate in the literature. In this chapter the differing views and research findings will be examined and evaluated. The nature of the research, source of funding and theoretical bias will be discussed in the following chapter, in an attempt to clarify the forces influencing biomedical research on coca chewing, and the disparate research findings which exist.

The research on the effects of coca chewing reflects several areas of debate among the researchers. There are those who feel the effects produced by coca are dangerous and degenerative (Saenz 1949, Gutierrez-Noriega and Zapata Ortiz 1948) and those who view coca as a beneficial stimulant at high altitudes and central to the Indian belief system (Monge 1952, Bolton 1976, Burchard 1976, von Glascoe et al. 1976).

This chapter will examine the negative findings which have contributed to political pressure for the eradication of coca, and the more recent positive findings which

contradict the older research and illustrate the need for more conclusive research and evidence before effective policy can be created.

RESEARCH FINDINGS

In the research claiming detrimental effects of coca chewing, coca is generally viewed as a causal factor in the poor health and living conditions of the indigenous population.* Other factors such as alcoholism, poor nutrition and geographical and social isolation are mentioned, but coca is seen as *the* important factor (Zapata Ortiz 1970: 291).

The positive research on coca chewing tends to view coca as one of several measures which help the Indians to cope with the hardships of high altitude, poverty and poor health.

The positive or negative role of coca in biocultural adaptation is still an open question in many ways; much important research is yet to be done, particularly pharmacological work on the cocaine content of coca and its metabolism. But while some researchers recognize this need for further research and evidence (Bolton 1976), others continue to feel that sufficient detrimental effects of coca chewing are known to justify the eradication of coca in Peru (Zapata Ortiz 1970, Buck et al. 1968).

---

*For a discussion of peasant health and the general health status of the highland Quechua, see Buck, Sasaki and Anderson 1968, Baker and Little 1978.

Early research on coca, done in the 1940's and 1950's, is still used to support this eradication position, the position of public policy in Peru, which is inherently negative toward coca chewing, and aims at diminishing production and the sale of coca leaves (U. N. report, 1950).

But due to a rise in world interest in drug problems, and the consequent availability of funds from agencies such as WHO and NIMH, a strong interest has developed in many aspects of coca chewing and research has increased in the 1960's and 1970's. Despite the positive and supportive findings of much of this recent research on the effects of coca chewing, policy continues to demand the eradication of coca. Scientific research has come to dispute coca policy; thus, all factors involved in the creation of policy (i.e., pressure groups) must be examined.

The reputed effects of coca chewing become very speculative when viewed in terms of possible compounding factors such as undernourishment, poor health conditions and heavy alcohol intake of the Andean rural population. Coca has become an easy mark for public sentiment, and its eradication seems more feasible than many other health, economic or political measures which are necessary to improve living conditions in the highlands. These problems, such as land shortage, contaminated water and poverty, illustrate the complexity of the problems of the highlands, and these problems have a much deeper cause than the simple use of a drug such as coca. The conditions of Indian

existence in Peru represent a formidable socio-economic problem.

But coca chewing has been focused on by national and international researchers as one of the major obstacles to change in the highlands, and this stance requires careful examination.

For the purposes of this thesis and clarity, the existent research on coca chewing and its effects will be discussed under the categories of 1) physical effects, 2) psychological effects, and 3) moral effects.

Physical Effects

When asked why they chew coca, the Quechua Indians invariably reply that it relieves hunger, suppresses thirst, and counteracts fatigue (Grinspoon and Bakalar 1976: 87). They do not report feelings of euphoria or addiction, nor do they discuss the symbolic aspects of coca chewing. But researchers continue to try to discover the scientific reasons for the continued chewing of coca among the Indians.

In 1948, Gutierrez-Noriega and Zapata Ortiz published one of the first systematic studies on coca chewing and its physical effects. In examining 500 "coqueros" they discovered serious signs of degeneration and disease, among them eye disease, anemia, weakness of muscles, and hyperthyroidism (Grinspoon 1976: 125). But this early study was done without controlling for other significant factors of causation of disease. Their results are hardly

surprising, as peasant health in the highlands tends to be generally poor due to limited, often insufficient, diet, unsanitary living conditions and indequate health care facilities. Coca chewing is only one of a multitude of factors which might affect peasant health.

In more recent studies conducted by Alfred Buck et al., the correlation between coca chewing and peasant health continues to be examined. A 1968 study tested three hypotheses drawn from the conclusions of the Commission of Enquiry on the Coca Leaf report: 1) coca contributes to malnutrition by satiating hunger, thus leading to a high rate of disease caused by nutritional deficiency; 2) coca chewing induces a state of indifference which leads to poor personal hygiene; and 3) coca chewers display lower work performance than non-chewers.

Their testing was carried out in a small montana community, pop. 492, altitude 2,400 ft. Their subjects consisted of migrant Quechuas from the highlands and resident mestizo chewers, matched for sex, ethnic group and age, with the control groups of non-chewers. Medical information was gathered for each group. The controls were found to have statistically significant levels of higher nutritional states.

Personal hygiene, determined by the presence of skin disease, rat bites and intestinal parasites, was found to be superior in the controls, with the exception of the intestinal parasites. The authors suggest that coca leaves may have amoebicidal properties because of the low

percentage of coca chewers infested with amoebae and the presence of infections with pathological potential in the chewers.

Coca chewers were found to have missed twice as many work days as the controls, due to illness; chewers were found to be suffering from severe anemia, hepatomegaly and lower hemoglobin levels, at a level twice as high as that of the controls (Buck et al. 1970: 25-31).

Thus, the results of the research support the hypotheses and the authors conclude that chronic coca chewing is *associated* with poor health. Their results are qualified, however, with a very significant statement:

> "Nevertheless, in the interpretation of the results of the study the complexity and the interactions of environmental and host factors which have to be considered become quite obvious. *The directions and sequences of causes and effects cannot be identified clearly because the conditions recognized by the study as probable disease determinants are arranged in a vicious circle*" [author's italics] (Buck et al. 1970: 31).

In addition, the study was conducted in a low altitude village where coca chewing is practiced by only a small percentage of the population. And significantly, the control groups were made up of many more Protestants, for whom the use of coca, alcohol and tobacco is forbidden. This conversion to Protestantism often represents a significant change in attitudes and lifestyle which would greatly affect work attitudes and personal hygiene. Thus, religion, not controlled for, may be a very important

factor affecting peasant life (Grinspoon and Bakalar 1976: 126).

Thus, even in this careful study with seemingly clear results, the research proves inconclusive. Coca chewing is one of many factors affecting peasant health, part of a cycle of disease in which the beginning and the end are not clearly visible.

Fabrega and Manning (1972), in their study of health maintenance activities among Peruvian peasants, discovered coca was a standard remedy for many health problems, among them hunger, poor spirits, and fatigue. The authors, in reference to the above research by Buck et al., state that:

> "Recent epidemiological studies conducted in Peru indicate that coca chewers tend to demonstrate a greater proportion of medical problems when compared to nonchewers. A number of additional social and cultural features that probably have medical implications distinguish chewers, however, so that the exact role of coca per se is undermined" (Fabrega and Manning 1972: 256).

Fabrega and Manning also make the point that the amount of cocaine ingested in the chewing of coca leaves is still uncertain (Fabrega and Manning 1972: 247). This is a very important point (Burchard 1975) and much debated in the literature, because it is largely the presence of cocaine, viewed as coca's active ingredient, which has caused such strong public sanctioning of coca chewing.

> "To a very large extent moralistic emphases have dominated descriptions of coca chewing: that is, essentially correctional intentions stemming from a preoccupation with the plant's active ingredient have implicitly entered into the analyses of the use of coca" (Fabrega and Manning 1972: 247).

The U. N. Commission of Experts states that coca leaf contains a high level of vitamin B^1, B^2 and C (U. N. 1950: 26). But they feel that cocaine content of the coca leaves overshadows any vitamin content, and the Commission recommends reduction and gradual phasing out of the production and sale of coca leaves.

Although the cocaine content of coca has not been determined, the U. N. experts recommend the extirpation of what may be an important source of vitamins for the highland population. Food supply is already scarce in the highlands, and coca leaves may provide a scarce resource.

A major debate surrounds the subject of the cocaine content of coca leaves. Early research on coca (Gutierrez-Noriega 1948, Zapata Ortiz 1949) views cocaine as the active alkaloid in coca. More recently, research has been published which questions that premise and suggests an alternate view.

The debate stems from the fact that there are at least 14 different alkaloids which have been isolated from the different varieties of coca leaves. These alkaloids belong to the tropane series, along with atropine and scolpolamine from the Solanaceous genera *Datura, Hyoscyamus, Atropa,* etc. The alkaloids which are found in coca are a combination of ecgonines, tropeines and hygrines. Included in the ecgonine derivatives are cocaine (methyl benzoyl ecgonine), methyl ecgonine and cinnomyl cocaine; in the

tropeines, tropeine and pseudotropeine, dihydroxypeine, tropacocaine and benzoyltropane; and in the hygrines, hygrine, hygroline and cuskohygrine (Martin 1975: 21). The sterosomers a- and b-truxilline have been isolated from coca leaves, and the presence of nitocine reported (*Ibid.*: 21).

Because of the isolation of cocaine alkaloids in coca leaves, scientific and public opinion has associated coca with cocaine, even to the point of failing to distinguish between the two drugs. This association is far from having been verified. But as Burchard comments in his article on coca chewing (1976: 467):

> "Since the isolation of cocaine alkaloids, both the pharmacological and behavioral effects of cocaine hydrochloride on humans and non-humans have served as *the model* for explaining coca use in Peru and elsewhere."

Burchard's research has focused on refuting the "cocaine-model" in research on coca, and directing research toward an "ecgonine-model." His research shows that it is probably ecgonine which is the central alkaloid activated in coca chewing, rather than cocaine (Burchard 1975: 464).

> "Several of the most cherished conceptions of the chewing of the coca leaf that we may have to put aside are that cocaine is in fact the central alkaloid in coca chewing, and that the "coquero" adds alkaline substances (cal, llipta. tocra, etc.) to the coca "bola" during the process of chewing to both facilitate the extraction of cocaine alkaloids and to potentiate their action" (Burchard 1975: 476).

Other researchers have long felt that the reason peasants chew coca is to extract the cocaine content, and the subsequent stimulation from the drug (Gutierrez-Noriega

1949). Consequently, the pharmacological and behavioral effects associated with cocaine have been used to condemn the use of coca. Many articles address the issue of the addictive properties of coca and there is frequent reference to the coca "addict" in the literature.

Euphoria is also an effect of cocaine which is attributed to coca. Gutierrez-Noriega (1952: 118) states

> "Thirdly, coca is chewed to produce a state of euphoria. The habituated chewers are, in general, depressed and apathetic, which in large part is a result of the bad diet and their chronic intoxication."

This theory also contributes to the moral degeneration effects of coca, to be discussed later in this chapter. But probably the most important (and damaging) effect of cocaine attributed to coca chewing is its reputed suppression of hunger.

This effect was first reported by the early chroniclers of the Conquest, as they described Indians able to walk and work for days without food, with only the aid of coca. "One of the most characteristic actions of coca and cocaine is the suppression of hunger and fatigue" (1949: 146). Because of this effect, Gutierrez-Noriega views coca as a dangerous contributor to malnutrition. In discussing coca's ability to suppress hunger, Gutierrez-Noriega postulates that:

> "The coca chewer, as a consequence, takes coca to suppress the disagreeable sensations that result from chronic inanition. But the use of the drug occasions, after some years, the loss of appetite. The habituated chewer *prefers the drug to food*. . . .From this, a vicious

> cycle is established; one begins to chew coca to suppress hunger but later the subject loses his appetite and eats little because he chews coca" (1952: 118).

This early research finding led to the hypothesis that coca causes malnutrition by acting as a food substitute for the highland people. The ability of coca to suppress hunber was attributed to the high cocaine content of coca leaves. The following statement by a former member of the U. N. Commission of Enquiry on Coca Leaf illustrates this hypothesis.

> "Cocaine has an inhibitory action on peripheral nerves and sensory nerve endings. It also has a specific action on the central nervous system, even in very low concentrations. . . .It abolishes the sensation of pain and also of taste and smell. An anesthesia of the stomach with cocaine takes away the sickish feeling in stomach disease. Mucous membranes after cocaine show a vasoconstriction. Stomach secretion is stopped. . . ." (Verzar 1955: 366-367).

Cocaine is assumed to be the active alkaloid in coca by Buck et al. (1970), in their first hypothesis, which states that coca chewing has a negative effect on nutrition and is associated with lower states of nutrition and nutritional deficiencies in coca chewers (1970: 31).

Lobb (1974) also comments on coca's ability to destroy the appetite, the low protein intake of the highland Indians, and the subsequent diseases, such as anemia, etc.

Hanna (1974) is skeptical in his view of the relation of coca to nutrition. He cites dietary studies which conclude that the Indian population is not suffering from severe hypocaloric intake (Mazess and Baker 1964;

Picon-Reatigui 1968). Because of these studies, Hanna feels that

> "the exact relationship between coca chewing and nutrition has not been established, but caloric deficiency does not seem to be the driving force in its use--except possibly during periods of acute hunger" (Hanna 1974: 290).

The debate on nutritional intake continues, but recently discussion of metabolic variables has become more controversial. Bolton (1972) hypothesizes that coca chewing may be beneficial in the regulation of low blood glucose levels, a problem recognized among Andean Indians (Bolton 1976: 631). Bolton stresses the point that generally it is the poverty of the highland Indians which limits their food intake, and the chewing of coca leaves helps to augment this intake by maintaining blood glucose levels. The foods available in the highlands tend to be high in carbohydrates, which is not conducive to maintaining glucose levels, as they are rapidly metabolized and glucose levels drop shortly after eating. Coca chewed after a meal stabilizes the glucose level for three to four hours, as would adequate protein intake (Bolton 1976: 632). Thus, Bolton hypothesizes that not only is coca *not* chewed as a food substitute but that it serves to enhance the food intake available. Fine (1960) also documents the fact that coca is often chewed in conjunction with or after a large meal.

Burchard (1975) comments that after chewing coca, Indians would often sit down to a large meal. Coca does not serve to make one "full" (as food does) but only to

assuage the feelings of hunger when food is unavailable. One of Burchard's informants commented, "Coca is good to chew but you have to eat food to live. All people have to eat food, no matter if they chew coca or not" (Burchard 1975: 478).

For Bolton (1976) the importance of coca lies in its ability to maintain glucose levels and thus to serve as a glucose homeostatic mechanism in the highland context. Although Bolton views coca chewing as having positive effects initially, by causing glucose stores to be transformed into available glucose, he feels "that it probably has long-term detrimental effects which complicate glucose homeostasis problems for the individual who chews" (Bolton 1973: 253).

Burchard disagrees with Bolton's implicit use of a "cocaine-model" explanation of coca use. Although Bolton admits that it is unclear how chewing coca leaves elevates blood glucose levels (1976: 631), Burchard suggests that Bolton would argue that it is

> "by cocaine stimulation of the sympathetic part of the autonomic nervous system, and the transformation of liver glycogen by increased levels of catecholamines (epinephrine and norepinephrine)" (Burchard 1975: 476).

In his 1976 article, Bolton states that the process is unclear, and proposes that

> "one of the alkaloids in coca may act on the adrenal medulla or in some other way may stimulate the process of gluconeogenesis" (Bolton 1976: 631).

Burchard's argument centers around an ecgonine-model as opposed to a cocaine-model of explanation of coca chewing. He argues that coca chewing, and the consequent metabolism of the alkaloid ecgonine, is important in the maintenance of glucose homeostasis, and that it contributes to the "normalization" of glucose levels (Burchard 1975: 476). Much of Burchard's research seeks to negate the cocaine-models predicated by early researchers (Gutierrez-Noriega 1949, Zapata Ortiz 1952). He carefully examines the degradation of cocaine reported by Montesinos (1965) and Nieschulz and Schmersahl (1969). The addition of an alkaline substance to the coca "bola" (quid) has long been cited as an example of the coca chewer trying to extract the most cocaine possible from the coca leaves (Verzar 1955). It is believed by some researchers that the alkaloid base frees the cocaine alkaloid so that it can be more readily absorbed directly into the blood stream, and act more effectively on the organism. Thus, the anesthetic powers of cocaine are activated (Verzar 1955: 366).

The research done by Montesinos (1965) and Nieschulz and Schmersahl (1969) confirms that an alkaline base contributes to the extraction of alkaloids from the coca leaf but also to the degradation of the cocaine alkaloid. Montesinos (1965: 13) observes that while alkaline solutions facilitate the extraction of cocaine, they do so only by breaking up the cocaine, or by hydrolysis.

> "If it is remembered that all the digestive juices take part in the hydrolysis, although each to a different degree of intensity, it must be supposed that the amount of cocaine passing into the bloodstream is insignificant in relation to the amount entering the organism" (Montesinos 1965: 14).

In light of this research, a statement by the Commission of Enquiry on the Coca Leaf (1950) that a coca addict ingests 50 grammes of coca leaf daily, in three doses, which equals 350 milligrammes of cocaine daily, requires reexamination and evaluation. This amount of cocaine surpasses the toxic level and yet chewers fail to exhibit toxic effects or even cortical stimulation (Montesinos 1965: 13; Grinspoon and Bakalar 1976). This discrepancy can be explained by the research findings on cocaine degradation and the hydrolysis of cocaine yielding benzoyl-ecgonine and ultimately ecgonine. Montesinos discusses the pharmacological action of ecgonine as ascertained by Vega Godoy (1960):

> "Ecgonine modifies the degree of blood pressure producing slight hypotension, has no influence on the salivary and sudiferous glands, slightly reduces the rate of breathing, produces slight myosis without altering the pupillary reflex, has no effect on the contraction of the striated muscle, and produces moderate relaxation of the muscles of the small intestine in the rat, while maintaining the peristaltic movements. . . ." (Montesinos 1965: 15).

Burchard reports that Nieschulz has discovered ecgonine to be

> "about 80 times less toxic than cocaine; that it has little or no central stimulating effect on the sympathetic nervous system; no anesthetic or euphoric properties; and

> that oral doses do increase the exertion capacity of mice, although less so than similar doses of cocaine" (1971: 285).

Moreover, Nieschulz demonstrates that the addicting, euphoric and anesthetic action of cocaine can only occur when the molecule is intact; therefore, cocaine is degraded into ecgonine. He states that the distinction between the chewing of coca leaf and "cocainism" is "pharmacologically supported" (Burchard 1975: 477).

According to the findings of this recent research, all other research employing a "cocaine-model" needs to be reexamined and evaluated. The strong prejudices and fears that center around cocaine are perhaps being mistakenly applied to the coca leaf and its use.

Burchard uses the term "ecgonine-model" to emphasize something other than cocaine, of the 14 alkaloids in the coca leaf. His model suggests that coca leaves may in fact be beneficial and "important in the control of problems of the malabsorption and too rapid transit of glucose" (Burchard 1975: 481). His hypothesis is supported by research on atropine (Gray 1973, Ritchie 1965). Ecgonine is closely related to tropine, an active component of atropine.

> "Therefore, the combination of ecgonine and the tropeine alkaloids also found in coca leaf may in fact be acting on the parasympathetic nervous system as opposed to the sympathetic, and a parasympathetic response has been reported (Risemberg 1950). Atropine also results in a rise in blood glucose (Berk et al. 1970). Moreover, atropine is among the drugs recommended by Miller and Keane (1972:461) 'to help control the symptoms of hypoglycemia.' Gray (1973:121)

> points out that malnutrition appears to play a role in the reduced capacity to digest and absorb carbohydrates. He writes: 'A study of atropine effect in man. . .showing an increased absorbtion of xylose (a sugar) suggests a possible mode of drug therapy that might be of benefit in patients with rapid intestinal transit of glucose.' He notes that atropine increases monosaccharide (of which glucose is the principal one) absorbtion by increasing the contact-time between carbohydrates and mucosa" (Burchard 1975: 480-481).

Consequently, Burchard recommends caution in generalizing from experiments using cocaine hydrochloride on humans and animals to the mastication of coca and its effects (Burchard 1975: 477).

Summary. The available research on the pharmacological and physical effects of coca chewing is contradictory and inconclusive. Although research demonstrates that coca chewing is associated with poor health and poverty, it has not proven that coca chewing is the cause of these conditions. The beneficial effects of coca are still unknown and largely unresearched. Research has centered around the cocaine properties of coca and the degenerative effects of coca chewing. Recent research questions the appropriateness of a cocaine-model explanation of coca chewing, supported by recent data on cocaine metabolism and degradation. Pharmacological and physical research is still in process on the coca leaf, and it appears from this review of the available literature that conclusive opinions on the effects of coca chewing must await the findings of this future research.

Psychological Effects

The psychological effects of coca chewing have been the focus of public concern and the basis for much research. The highland Indians, largely the chewers of coca, have been described by observers as apathetic, indolent, lazy and ignorant. These characteristics have been attributed to the Indian dependence on coca chewing. Other factors, such as poor living condition, lack of health facilities, social isolation and poor educational facilities, are recognized, but coca is considered by many researchers to be the most important factor in determining the psychological state of coca chewers (Zapata Ortiz 1952).

The methodological difficulties in demonstrating a causal relationship between coca and psychological deterioration are obvious in the literature. A multitude of environmental variables, unstandardized testing techniques, and no clear categories of mental health all contribute to very ambiguous findings, open to various interpretations. Unsubstantiated opinions abound in the literature. Coca is frequently described as euphoric, hallucinogenic and toxic without evidence to support these claims being provided. Particularly in the category of psychology, effects are difficult to measure and determine.

Despite the fact that the researchers recognize that coca can be given up easily, with none of the signs of withdrawal or pains of addiction, they persist in referring

to the coca "addict" (Zapata Ortiz 1952), which perpetuates the fears of the public and contributes to the viewing of coca as a "dangerous" drug.

In 1950, Gutierrez-Noriega and Zapata Ortiz conducted a study designed to explore the personality and intelligence of chronic coca chewers. Utilizing the Binet and Porteus maze tests for intelligence testing, and the Rohrschach tests for personality determination, they concluded that chronic coca chewing leads to subnormal intelligence, intellectual deterioration and an apathetic personality (as quoted in Grinspoon 1976: 127). Their study, however, was conducted in Lima, where coca chewing is practiced by a deviant minority, which calls into question their research findings.

In 1952, Zapata Ortiz published an article on the problem of coca chewing in Peru, in which he reiterates the dangerous, degenerative psychological effects of coca chewing.

> "No less important than the physiological changes are the psychological modifications which coca produces. The acute effects on mental activity are various. Large doses of coca produce changes in thinking, effectiveness, perception, etc. The chronic psychological changes are those which are of greatest interest and to which particular attention has been devoted" (1952: 29).

Zapata Ortiz makes special note of the close relationship between intelligence and duration of addiction. He states that the mental deficiencies from which coca chewers suffer begin with addiction to coca, and increase over time. The implication of this deterioration from chronic

intoxication is that it causes the coca chewer to willingly accept the poor living conditions of the highlands. Thus, coca is seen as responsible for the condition of the Indian in Peru (1952: 29).

> "It is undeniable that other factors may have an adverse effect on mental development, such as education, language, alcoholism, nutritional deficiencies, etc. In a previous publication we studied in detail the part played by each of these factors in the coca addicts' mental backwardness, and we believe that these factors are of secondary importance. The relation between the duration of addiction to the drug and mental deterioration shows that coca is the chief cause of the deficiencies encountered" (1952: 29).

The work done by Gutierrez-Noriega and Zapata Ortiz has been heavily criticized by more recent researchers (Grinspoon and Bakalar 1976, Andrews and Solomon 1975) for their failure to control for other variables, and their biased perspective on Indians. Nonetheless, their work has formed the basis for much later research. Gutierrez-Noriega himself, after concluding his research on the detrimental effects of coca chewing, stated that:

> "in order to support such assumptions (regarding the adverse effects of coca) it would be necessary to perform psychological tests on large samples matched on social, ethnic and geographical levels" (as quoted in Negrete and Murphy 1967: 12).

Following this approach, in 1967 Negrete and Murphy conducted a study concerning coca chewing and psychological damage. Their study was designed to look for specific brain damage caused by coca chewing. Their major question was whether coca chewing causes a psychological deficit sufficient to keep the chewers from utilizing important

social and educational opportunities if they were made available (Negrete and Murphy 1967: 12).

Their study was carried out in northern Argentina among sugar plantation workers. They excluded those workers with a history of head injury or any illness known to affect mental functioning, poor work records or excessive use of alcohol. The men designated as chewers chewed an average of 200 grams per week for a ten year period. Nonchewing controls ideally had never chewed, or at least never more than 10 grams per week (1967: 12).

Negrete and Murphy created a battery of tests attempting to measure brain damage in any part of the brain. They used such tests as the Seguin Form Board to test spatial and tactile memory and learning; figure completion and similarity recognition from the Army Beta scale; Knox cubes as an attention test; and a verbal intelligence test (1967: 13).

The test of verbal intelligence showed no significant differences between the chewers and controls. However, in all other areas the chewers scored poorly in comparison with the control group. The authors did not feel that coca chewers take up the habit because they are deficient initially or that they are less intelligent; they contend that this would have showed on the verbal intelligence test, which it did not. In further analysis, they found a relationship between duration of chewing and the memory, learning and attention test scores. No difference could

be observed during acute intoxication in the chewers' behavior, nor did any appear in test scores.

The authors conclude that long term coca chewing does have an adverse effect on the brain. It cannot be observed casually because the deficiencies are of a specific kind, not required in everyday normal social functioning.

In a later study designed to answer their initial question on the effects of possible psychological deficit on the ability of coca chewers to benefit from socio-economic opportunities if made available, Murphy, Negrete and Rios (1969) examined the effects of abstinence and retraining on coca chewers. Again in northern Argentina, in the same area, they chose 20 coca chewers and 10 controls to be confined to a hospital wing for ten days of testing and observation. Ten of the coca chewers were supplied with coca; the other ten abstained from chewing. A battery of tests designed from those in the previous study which most sharply differentiated between the coca chewers and nonchewers was administered every three days throughout the confinement.

The results were not affected by recent consumption or abstinence. The control group scored highest on the first testing, and all three groups improved with each testing. The authors feel this confirmed their findings of psychological deficit in their earlier study (1969: 43). Within the battery of tests, coca chewers, abstainers and nonchewers scored and improved differentially. The

coca chewers were able to catch up with the nonchewers in the tests requiring manual dexterity, no memorizing, and no requirement for abstract thinking.

Literate nonchewers scored very high on the memory and attention tests, the illiterate nonchewers scored low, while the coca chewers, literate and nonliterate, both scored poorly. From this the authors conclude that there is a type of learning developed only in formal schooling which is destroyed by coca chewing. Thus, the authors feel they have evidence that coca chewing does affect intellectual performance in a detrimental way.

> "Our results confirm that coca-users fall behind control subjects in some, though not all, of our tests, and that they are probably suffering from some form of brain damage. For public health and social planning in the Andes region it is of some importance to assess how great this damage is, and which mental functions it would interfere with in real life" (1969: 45).

The defect in abstract thinking found among the coca chewers is compared with that of lobotomized patients by the authors. The damage is generalized, affecting the whole brain rather than one particular system, in these patients. A description of patients suffering from the loss of brain tissue, as given by Dr. Goldstein, is similar to the description given of heavy coca chewers in the Andes: the patient with a deficiency in abstract thinking typically "appears passive, lacks initiative and decision, has great difficulty. . .in making a choice, in finding out the essentials of a situation" (as quoted in Negrete and Murphy 1969: 47).

Thus, the authors conclude that chronic coca chewers could handle concrete innovations, i.e., new farm machinery, etc., but could be expected to have some difficulty in grasping the abstract principles behind change and innovation (1969: 47).

The work done by Negrete, Murphy and Rios has been criticized on various points (Grinspoon and Bakalar 1976: 124). The most salient point is the causal relationship between test scores and coca posited by Negrete, Murphy and Rios. Because of the sheer number of environmental variables interacting along with coca, and the ambiguity of psychological testing, the results remain debatable and inconclusive.

By excluding excessive drinkers and men with poor work records, the authors created a biased sample, because men who may have had similar psychological tendencies but opted for coca were included in the chewer group. Nutrition, which has been cited as a cause of coca chewing in othe research, was only cursorily examined. The effects of malnutrition of poor diet may affect the psychological condition of coca chewers as much as or more than the chewing of coca leaves (Grinspoon and Bakalar 1976: 124).

Summary. The psychological effects of coca chewing are perhaps the most difficult to substantiate in the debate on the effects of coca chewing. The apathy, illiteracy and ignorance ascribed to the highland Indian population cannot be simply attributed to coca chewing.

Within the literature, many facile statements are made as to the damaging psychological effects of coca, its hallucinogenic qualities, or retarding influence (Blejer-Prieto 1965: 703). From these casual observations are formed offical opinions and government policy. Scientific researchers have an obligation to recognize the methodological difficulties in demonstrating a causal relationship between coca chewing and psychological damage. The complex environmental factors which affect the highland population and the ambiguity of the psychological tests available leave inconclusive the research done on the psychological effects of coca chewing.

Moral Effects

The moral effects of coca chewing are perhaps the least discussed in the literature in explicit terms, but in many respects they are of primary concern. Attitudes toward morality play a major role in shaping governmental policy, and what is deemed acceptable largely determines what becomes legal or illegal.

The assimilation of the Indian into the national social structure of Peru has been of key interest to the government since the beginning of the twentieth century (Gagliano 1976: 60). Coca chewing has long been viewed as an obstacle to this goal of assimilation. One early activist, Hermilio Valdizan, argued that coca was the most important sociomedical problem to be faced in the Andes. He felt that the use of coca perpetuated the

cultural isolation of the highland Indians, and that the use of coca led to racial degeneration (Gagliano 1976: 60).

This view of coca chewing is repeated by Blejer-Prieto, a physician, who states: "The pathological somatic effects of coca may be disputed but the psychological and moral deterioration which affects the chewer cannot be denied" (1965: 703). Researchers who share this view feel that coca chewing causes or strongly contributes to the lethargy, apathy and acceptance of their social position on the part of the highland Indian (Zapata Ortiz 1970). Coca is often regarded as a vice, which because of its reputed addictive or habituating qualities becomes progressively more powerful and creates the desire to only chew coca and feel its effects.

Coca chewing as the cause of immoral sexual behavior is another point of concern. Coca has become associated with increased sexuality, and tales of old coca chewers with special sexual prowess are repeated as evidence (Grinspoon and Bakalar 1976: 108). Cocaine also suffers from the public sentiment that drug use increases sexual drive and precipitates the breakup of the family, promiscuity and epidemic venereal disease. Cocaine as a central nervous stimulant does increase sensory stimulation initially, but eventually tends to inhibit sexual response.

Grinspoon and Bakalar (1976: 108) report Gutierrez-Noriega's finding that rarely do the Indians find coca to be sexually stimulating. Among the Kogi Indians of Colombia, coca is used in religious rituals by the men

only, to aid in fasting, staying awake and sexual abstinence. The women of the tribe feel they are in competition with coca, which they feel causes their men to eventually lose interest in sex and to become impotent (Grinspoon and Bakalar 1976: 16).

It is interesting to note the paradox in Indian attitudes and Ladino attitudes toward coca. Indians, according to the little data available on their perspectives, view coca as a stimulant; it helps when heavy work must be done. It makes work easier to do and more tolerable. It also helps one to stay awake and aids in easing hunger and thirst (Fine 1960: 20). The Ladino attitude, on the other hand, perceives coca to be the cause of lethargy, apathy, depression and moral degeneration. These two perspectives are in direct conflict, and they represent the conflict between the user and the researcher or policy-maker.

Indians feel that coca aids their lifestyle; in many areas it serves a medicinal purpose (i.e., as a poultice, tea or diagnostic tool), and in most areas it is viewed as a work aid.

Researchers who condemn coca use view it as a vice, as a cause of the poverty and deprivation existent in the highlands. The Indians contend that it is a tool to aid in their adaptation to a harsh environment and subordinate social position: an aid to their survival.

The morality of one sector of society is not necessarily interchangeable with that of another sector. The

decision to choose and enforce one morality over another is a complex and dangerous decision.

Summary. The moral effect of coca chewing is one of the most controversial and influential areas of interest in research and in policy-making. The data available are highly subjective and reflect class and ethnic prejudices. The Indian perspective has been little explored or documented. Researchers tend to use their own value systems and social perspective (or that of the dominant sector) to judge another, entirely different one. Morality is an especially elusive area for research and the current statements regarding the moral effects of coca chewing reflect highly judgmental subjective observations and little objective scientific research.

CHAPTER IV

CONCLUSIONS

In this study I have outlined and given evidence in support of two major hypotheses. First, that governmental policy reflects certain interests, economic, political and social, and is justified by selective use of the available research. Second, that research itself is subject to various biases: source of funding, intellectual bias of the researcher, ethnocentrism, and societal prejudices, particularly evident in research concerning minority groups.

One of the most influential factors affecting coca policy is that the policy largely deals with the Indian population. Thus, coca legislation falls within a central issue in Peru, the "Indian Problem." Policy, treatment of and attitudes toward the Indians of Peru have been outlined in the historical section of this thesis. The Indians have been the victims of various kinds of exploitation since the Conquest. Their place within the social structure has always been at the bottom, but intricately tied into the domination system of the encomienda, hacienda or cooperative. Attempts at integration and assimilation in the republican period failed due to a lack of

understanding of the Indians' most pressing problems, i.e., lack of land, poor legislation, lack of enforcement, and sheer neglect (Davies 1974). In contemporary times, statements have been made by the military government which promise understanding and change (Bourque and Palmer 1975). But the early stages of the Agrarian Reform program continue to manifest policy imposed from above, which inaccurately diagnoses the needs and realities of the sierra (Guillet 1978). Attention continues to be focused on initial passage of the reform, while the campesinos struggle with poor implementation, lack of enforcement of laws and protection of Indian rights. Like Agrarian Reform, coca policy is an area which reflects the attitudes of ladinos toward Indians. Ladinos make policy, not Indians. Coca chewing has been selected by Ladinos as one of the most pressing health problems in the highlands.

As discussed in Chapter III, research on coca chewing frequently describes coca as the cause of ill health, laziness, apathy and asocial behavior on the part of the Indians. As demonstrated in Chapter III, there is considerable research available to contradict or dispute these accusations. A central theme of this paper is that the behavior, health and psychological state of the Indians is, in fact, more a reflection of their subjugated position within the social structure of Peru, and would respond more promptly to changes in economic and social position than to the cessation of coca chewing. Coca chewing has provided an expedient, emotional issue for politicians and

policy-makers to play upon the public. By depicting coca, an "Indian" drug, as the evil of the highlands, successive governments have skirted the real issues of land tenure and protective labor laws in the highlands.

The issue of coca chewing, after reviewing the available biomedical research, needs to be much more carefully examined. The research as a whole is largely inconclusive. The pharmacological effects of coca chewing continue to be researched by Burchard and Bolton, among others. Their research points to possible beneficial effects of chewing coca, i.e., stabilizing blood glucose levels. Thus, the use of coca may be proven not to be detrimental to health but, in fact, beneficial.

The detrimental effects attributed to coca during the 1940's and 1950's, such as addictive qualities, moral degeneration and psychological damage, have largely been proven false in more recent research.* Claims of psychological damage resulting in illiteracy, lowered I.Q.'s,

---

*Much of the more recent research which supports the beneficial aspects of coca chewing in the highlands of Peru is, indeed, very recent. The effects of this research on relevant policy in Peru cannot be predicted. The work of Metzger et al. (1976), funded by N.I.D.A., and that of Burchard (1976), for example, has contributed to increased interest in the U.S. concerning the policy on coca chewing. In November 1978, the Council of the American Anthropological Association moved to "condemn the uniform policy position of the U.S. government and the United Nations toward the eradication of the production and use of coca in the Andes based on the ill-informed and out-dated 1950 data of the United Nations Commission of Inquiry on the Use of the Coca Leaf" (American Anthropological Association Newsletter, January 1979, Vol. 20, No. 1).

etc., are inextricably tied to prejudice against Indians and Ladino ethnocentrism. The notion of "moral degeneration" also reflects the biases of racism and ethnocentrism. The circular reasoning and unsubstantiated statements regarding coca chewing as the cause of psychological, physical, pharmacological or moral degeneration reflect the need for further, more controlled research on coca chewing and its effects.

The interconnections of coca with cocaine are vast and important for understanding coca policy. The problems of drug control in the Western world have increased since the 1940's. Enforcement has not proved successful in suppressing illicit traffic in narcotics. The West's interest in eliminating coca production has been discussed above. It is clear that eradication of the coca plantations would greatly alter the availability of cocaine.

Thus, coca is tied into the world drug problem. Drug abuse is a highly emotional issue in most countries; which drugs are tolerated and which forbidden and feared involve a complex decision. In the United States, alcohol is a highly accepted drug, as are cigarettes and coffee. This is despite the fact that there exists scientific research which demonstrates that cigarettes can lead to cancer and irreparable lung and heart damage. But a large percentage of the population chooses to ignore this research and to exercise their individual right to smoke. Cigarettes provide considerable tax revenue for the Federal Government, so there is little to encourage Federal agencies to press

for legislative reform. The use of cannabis, on the other hand, continues to carry a criminal penalty, despite the fact that there is research to support the medical value of cannabis in treating glaucoma. But cannabis is not a drug used by the majority; it has become a symbol of the counterculture, and that stigma may make legalization a very distant reality. As Grinspoon and Bakalar so clearly point out:

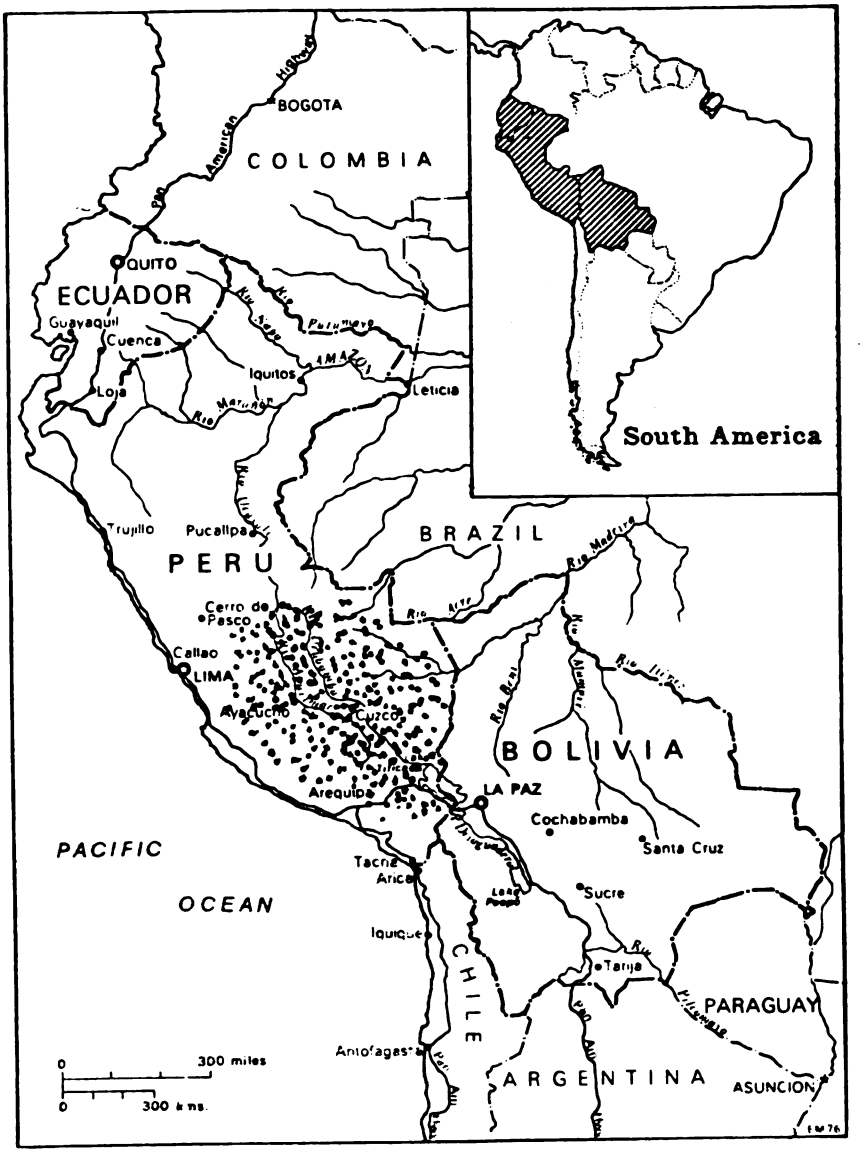
> "We have written of drug abuse in general and cocaine abuse in particular as though they were at least potentially clearly conceived problems with common sense answers. Even so, we have been unable to avoid repeated hints that the drug problem may be a misconception, that to center one's interest on drugs, drug users, and the prevention of drug use is to mislocate the issues, and that even those who worry most about drugs are often really concerned about something else. Common sense may be no more than the shared prejudices of a whole society or culture. Our own common sense, for example, makes it necessary for authorities to debate gravely whether possession of marihuana should be decriminalized, even though countless obviously more harmful and dangerous commodities are sold freely. *The real issue* is often not the chemical substances but blacks or hippies, or the Establishment, or musical preferences, or sexual habits, or attitudes toward work" (1976: 238).

Thus, the hidden concern behind the coca issue is the Indian. Alcohol is used in quantity in Indian communities, and it is reputed to cause liver and kidney damage, brain damage, loss of work days, family violence. But alcohol differs from coca in that it is an accepted drug, used by Ladino society. Much of the research on coca mentions alcohol use and some admits the difficulty in separating the damage of the two drugs. But coca is above all an

"Indian" drug, disdained by most mestizos and upper social segments of society in Peru. The Indian is backward, illiterate, apathetic; it is coca, the "Indian" drug, which causes the Indian dilemma. It is an easy connection, and an easy way out; the Indian in Peru is an exploited segment of society with serious problems. It is not in the interests of many in Peru (and internationally) to stop the exploitation, although some initial steps have been taken. By focusing on coca chewing rather than a radical change in the social structure of Peru, which would more directly affect sanitation, education, land distribution and national unity, the government professes concern for the plight of the Indian and yet succeeds in blocking any real structural change.

The time, money and manpower which would need to be invested to enforce the prohibition of coca might be more profitably invested in solving the real problems of the highlands, i.e., the enforcement of agrarian reform laws, improved education programs, and health care systems. But change in no *one* of these aspects alone will effectively ameliorate the situation of the Indian. One of the most valuable insights that can be distilled from this analysis of the "coca problem" is that the situation of the Indian in Peru is highly complex and interwoven into a system of domination which would not benefit from the extrication of the Indian. Solutions which may have an impact on the position and survival of the Indian will have to be multi-dimensional, for the problems are themselves multi-faceted.

No superficial change will affect the conditions of the sierra. The eradication of coca chewing will merely eliminate an Indian adaptation to the social, economic and physical environment. The most important function an examination of coca chewing and its effects can serve is as an indicator of the complex problems which the coca issue masks, the problems discussed above--the components of the "Indian Problem" in Peru.



Peru, Bolivia, and Ecuador

Figure 1. Distribution of Quechua speakers in Peru (adapted from Pike 1977 and Ruhlen 1975: 315).

BIBLIOGRAPHY

BIBLIOGRAPHY

Adams, Richard N.
1967 Nationalization. In *Handbook of Middle American Indians*, ed. Manning Nash. Pp. 469-489.

Andrews, George and David Solomon, eds.
1975 *The Coca Leaf and Cocaine Papers*. New York: Harcourt Brace Jovanovich.

Arriaga, Pablo Jose de
1968 *The Extirpation of Idolatry in Peru*. L. Clark Keating, trans. and ed. Lexington: University of Kentucky Press.

Ashley, Richard
1975 *Cocaine: Its History, Uses and Effects*. New York: St. Martin's Press.

Baker, Paul T. and Michael A. Little, eds.
1978 *Man in the Andes: A Multidisciplinary Study of High Altitude Quechua*. Stroudsburg, PA: Dowden, Hutchinson & Ross.

Baker, Paul T.
1969 Human Adaptation to High Altitude. Science 163: 1149-1156.

Baudin, Louis
1961 *Daily Life in Peru*. London: George Allen and Unwin, LTD.

Behrhorst, Carroll
1975 The Chimaltenango Development Project in Guatemala. In *Health by the People*, ed. Kenneth W. Newell. WHO: Geneva.

Bejarano, Jorge
1961 Present State of the Coca-Leaf Habit in Colombia. Bulletin on Narcotics 13: 1-16.

Blejer-Prieto, H.
1965 Coca Leaf and Cocaine Addiction - Some Historical Notes. Canadian Medical Association Journal vol. 93, pp. 700-704.

Bodley, John H.
1975 *Victims of Progress*. Menlo Park, CA: Cummings Publishing Co.

Bolton, Ralph
1976 Andean Coca Chewing: A Metabolic Perpsective. American Anthropologist 78: 630-634.

Bourque, Susan C. and David Scott Palmer
1975 Transforming the Rural Sector: Government Policy and Peasant Response. In *The Peruvian Experiment: Continuity and Change Under Military Rule*, ed. Abraham F. Lowenthal. Princeton, NJ: Princeton University Press.

Bourricaud, Francois
1975 Indian, Mestizo and Cholo as Symbols in the Peruvian System of Stratification. In *Ethnicity*, eds. Nathan Glazer and Daniel P. Moynihan. Cambridge, MA: Harvard University Press. Pp. 350-387.

Brecher, Edward M. and the Eds. of Consumer Reports
1972 *Licit and Illicit Drugs*. Boston, MA: Little, Brown and Co.

Buck, Alfred A., Tom T. Sasaki, and Robert T. Anderson
1968 *Health and Disease in Four Peruvian Villages: Contrasts in Epidemiology*. Baltimore, MD: Johns Hopkins Press.

1970 Coca Chewing and Health: An Epidemiologic Study Among Residents of a Peruvian Village. Bulletin on Narcotics, vol. XXII, No. 4, Pp. 23-32.

Bues, C.
1935 La Coca en el Peru. Boletin de la Direcćion de Agricultura y Canaderia 5: 3-72.

Burchard, Roderick
1975 Coca Chewing: A New Perspective. In *Cannabis and Culture*, ed. Vera Rubin. The Hague: Mouton Publishers. Pp. 463-484.

1976 Myths of the Sacred Leaf: Ecological Perspectives on Coca and Peasant Biocultural Adaptation in Peru. Indiana University, Ph.D. dissertation.

Cardenas, Martin
Psychological Aspects of Coca Addiction. Bulletin on Narcotics 4, no. 2: 6-9.

Chaplin, David, ed.
1976 *Peruvian Nationalism*. New Brunswick, NJ: Transaction Books.

Cieza de Leon, Pedro
1959 *The Incas of Pedro de Cieza de Leon*, ed. Victor Wolfgang Von Hagen. Norman, OK: University of Oklahoma Press.

Coser, Lewis A.
Sociology of Knowledge. In *Encyclopedias of the Social Sciences*. Pp. 428-435.

Cotler, Julio
1968 The Mechanics of Internal Domination and Social Change in Peru. Studies in Comparative International Development, Vol. III, No. 12.

Davies, Thomas M.
1974 *Indian Integration in Peru: A Half Century of Experience, 1900-1948*. Lincoln, NB: University of Nebraska Press.

Dobyns, Henry F.
1964 *The Social Matrix of Peruvian Indigenous Communities*. Cornell Peru Project Monograph. Ithaca, NY: Cornell University.

Dobyns, Henry F. and Paul L. Doughty
1976 *Peru: A Cultural History*. New York: Oxford University Press.

Donahue, John M.
1978 Health Delivery in Rural Bolivia. Paper presented AAA meetings, Los Angeles, CA, November 14-19, 1978.

Estanco de la Coca
1962 Ten Years of the Coca Monopoly in Peru. Bulletin on Narcotics 14: 9-17.

Fabrega, Horacio and Peter K. Manning
1972 Health Maintenance Among Peruvian Peasants. Human Organization 31: 243-256.

Fine, Norman Lowy
1960 Coca Chewing: A Social Versus a Nutritional Interpretation. Mimeograph. New York: Columbia University.

Fitzgerald, E. V. K.
1976 *The State and Economic Development: Peru Since 1968*. Cambridge: Cambridge University Press.

Fuchs, Andrew
1978 Coca Chewing and High-Altitude Stress: Possible Effects of Coca Alkaloids on Erythropoiesis. Current Anthropology, Vol. 19, No. 2, Pp. 277-291.

Gagliano, Joseph
1963 The Coca Debate in Colonial Peru. The Americans 20: 43-64.

1976 Coca and Popular Medicine in Peru: An Historical Analysis of Attitude. In *Medical Anthropology*.

Garcilasco de la Vega, el Inca
1961 *The Incas: The Royal Commentaries of the Inca, Garcilasco de la Vega, 1539-1616*. Maria Jolas, trans. New York: Orion Press.

Glazer, Nathan and Daniel P. Moynihan, eds.
1975 *Ethnicity: Theory and Experience*. Cambridge, MA: Harvard University Press.

Goddard, D., S. N. de Goddard, and P. C. Whitehead
1969 Social Factors Associated with Coca Use in the Andean Region. The International Journal of the Addictions 4: 577-590.

Granier-Doveus, Marcel
1962 Some Sociological Aspects of the Problem of Cocaism. Bulletin on Narcotics 14: 1-16.

Gray, G. M.
1973 Drugs, Malnutrition, and Carbohydrate Absorbtion. American Journal of Clinical Nutrition 26: 121-124.

Grinspoon, Lester and James B. Bakalar
1976 *Cocaine: A Drug and Its Social Evolution*. New York: Basic Books, Inc.

Guillet, David
1978 Peruvian Rural Class Structure and the Impact of Agrarian Reform. Mimeograph. Revised draft of paper presented at the Conference on Attitudinal and Behavioral Changes in Rural Life, Lincoln, NB.

Hanna, Joel M.
1974 Coca Leaf Use in Southern Peru: Some Biosocial Aspects. American Anthropologist, Vol. 76, Pp. 281-296.

Helmer, John
1975 *Drugs and Minority Oppression*. New York: The Seabury Press.

Herring, Hubert
1964 *A History of Latin America from the Beginnings to the Present*. New York: Alfred A. Knopf.

Illich, Ivan D.
1971 *Celebration of Awareness.* Garden City, NY: Doubleday & Co., Inc.

International Narcotics Control Board
1973 Report of the International Narcotics Control Board in 1972. Bulletin on Narcotics, Vol. XXV, No. 2.

Kuhn, Thomas S.
1970 *The Structure of Scientific Revolutions.* Chicago: The University of Chicago Press.

Lanning, Edward P.
1967 *Peru Before the Incas.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Lapeyre, Luis Vásquez
1952 Documentados relacionados con la labor electuada por la Comision Peruana para el Estudio del Problema de la Coca. Perú Indigena 3 (December): 24-130.

Ley de Represion del Trafico Ilicito de Drojas
1978 *Decreto Ley No. 22095.* Editorial InKari.

Little, Michael A.
1970 Effects of Alcohol and Coca on Foot Temperature Responses of Highland Peruvians During a Localized Cold Exposure. American Journal of Physical Anthropology 32: 233-242.

Lobb, Gary C.
1974 El Uso de la coca como manifestacion de cultura indigena en las montanas occidentales de Sudamerica. America Indigena, Vol. XXXIV, No. 4: 919-938.

Long, Norman
1975 Structural Dependency, Modes of Production and Economic Brokerage in Rural Peru. In *Beyond the Sociology of Development,* eds. Ivar Oxaal, Tony Barnett, and David Booth. Pp. 253-282.

1978 The Sociology of Rural Development.

Mannheim, Karl
1936 *Ideology and Utopia: An Introduction to the Sociology of Knowledge.* New York: Harcourt, Brace & World, Inc.

Mariategui, Jose Carlos
1969 *Siete Ensayos de Interpretacion de la Realidad Peruana.* Lima: Biblioteca "Amauta".

Martin, Richard T.
1975 The Role of Coca in the History, Religion, and Medicine of South American Indians. In *The Coca Leaf and Cocaine Papers*, eds. David Andrews and Solomon.

Metzger, Duane, Aguiles Palomino O., Christine Von Glascoe, Ernesto Vargas P., and Carter Wilson
1976 Toward and Understanding of Quechua Categories of Coca Quantity: The W...V Shift. Peruvian Pieces II. Social Science Working Papers, 113. Uni-ersity of California, Irvine.

Monge, Carlos M.
1952 The Need for Studying the Problem of Coca-Leaf Chewing. Bulletin on Narcotics 4: 13-15.

Montesinos, Fernando
1965 Metabolism of Cocaine. Bulletin on Narcotics, Vol. XVII, No. 2.

Mortimer, W. Golden
1974 *History of Coca: The Divine Plant of the Incas.* San Francisco: And/Or Press.

Musto, David F.
1973 *The American Disease: Origins of Narcotic Control.* New Haven: Yale University Press.

Naranjo, Plutarco
1974 El cocaismo entre los aborigenes de Sud America. America Indigena, Vol. XXXIV, No. 3: 605-628.

Oxaal, Ivar, Tony Barnett, and David Booth, eds.
1975 *Beyond the Sociology of Development: Economy and Society in Latin America and Africa.* Boston, MA: Routledge & Kegan Paul.

Pike, Fredrick B.
1977 *The United States and the Andean Republics: Peru, Bolivia and Ecuador.* Cambridge, MA: Harvard University Press.

Ricketts, Carlos
1954 La masticacion de las hojas de coca en el Peru. America Indigena 14: 113-126.

Ritchie, J. Murdoch, P. J. Cohen, and R. D. Dripps
1965 Cocaine: Procaine and Other Synthetic Local Anesthetics. In *The Pharmacological Basis of Therapeutics*, 3rd ed., eds. L. S. Goodman and A. Gilman. New York: Macmillan.

Ruhlen, Merritt
1975 *A Guide to Languages of the World.* Language Universals Project: Stanford University.

Service, Elman R.
1955 Indian-European Relations in Colonial Latin America. American Anthropologist 57: 411-425.

Stark, Werner
1967 Sociology of Knowledge. In *The Encyclopedia of Philosophy,* Vol. 7-8. New York: Macmillan Publishers Co., Inc.

Silverman, Milton
1977 The Epidemiology of Drug Promotion. International Journal of Health Services, Vol. 7, No. 2: 157-166.

Taussig, Michael
1978 Nutrition, Development, and Foreign Aid: A Case Study of U.S.-Directed Health Care in a Colombian Plantation Zone. International Journal of Health Services, Vol. 8, No. 1.

Tullis, La Mond F.
1970 *Lord and Peasant in Peru.* Cambridge, MA: Harvard University Press.

Ugarte, Marco
1978 La Coca: Instrumento de Dominacion. Paper given at *III Seminario Estructura Agraria* at the Universidad Nacional de San Antonio Abad del Cusco, Direcion Universitaria de Investigacion.

United Nations Economic and Social Council
1950 Report of the Commission of Enquiry on the Coca Leaf. Official Record, Twelfth Session, Special Supplement No. 1, Lake Success, New York.

Uzzell, Douglas
1972 Bound for Places I'm Not Known to: Adaptation of Migrants and Residence in Four Irregular Settlements in Lima, Peru. Unpublished Ph.D. dissertation, University of Texas, Austin.

Van Den Berghe, Pierre, ed.
1974 *Class and Ethnicity in Peru.* Leiden: E. J. Brill.

Van Den Berghe, Pierre and George Primov
1977 *Inequality in the Peruvian Andes: Class and Ethnicity in Cuzco.* Columbia, MO: University of Missouri Press.

Vietmeyer, Noel D.
1978 Incredible Odyssey of a Visionary Victorian Peddler. Smithsonian, August, Pp. 91-102.

von Glascoe, Christine, Duane Metzger, Auiles Palomino O., Ernesto Vargas P., and Carter Wilson
1976 Are You Going to Learn to Chew Coca Like Us? Stages in the Acquisition of Coca *Realis*, Peruvian Pieces IV. Social Science Working Papers, 116. Irvine, CA: University of California.

Webster, Steven S.
1970 The Contemporary Quechua Indigenous Culture of Highland Peru: An Annotated Bibliography I, II. Behavior Science Notes 5: 71-96, 213-248.

Wolff, Pablo Oswaldo
1950 Annotated Bibliography on the Effects of Chewing the Coca Leaf. Annex II. United Nations. Report of the Commission of the Enquiry on the Coca Leaf. Lake Success, NY.

1952 General Considerations on the Problem of Coca-Leaf Chewing. Bulletin on Narcotics 4: 2-6.

Zapata Ortiz, Vicente
1952 The Problem of the Chewing of the Coca Leaf in Peru. Bulletin on Narcotics 4: 27-36.

1970 The Chewing of Coca Leaves in Peru. International Journal of the Addictions 5: 287-294.