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AMERICA, HAWAI'I AND THE SEA: THE IMPACT OF AMERICA
ON THE HAWAIIAN MARITIME MODE OF PRODUCTION 1778-1850

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN AMERICAN STUDIES

August 1986

By

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ACKNOWLEDGEMENTS

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ABSTRACT

Contact with the expanding capitalist world-system, primarily via its American representatives, enabled Hawaiian chiefs to obtain access to resources independent of kinship and helped them destroy the kinship mode of production in Hawai'i. The Hawaiian maritime system, which traditionally had operated in equilibrium with the environment and had provided the major source of protein for a population of some 250,000 people, was destroyed.

Ocean resources were critical to the privileged position assumed by colonial New England in the expansion of the capitalist world-system. The American approach to these resources, a system of ecological disequilibrium, ultimately led to the widespread destruction of marine mammals in the Atlantic and forced Americans into the Pacific at the end of the Revolution. Americans dominated the Pacific northwest fur trade after 1795, and from that date were the major contact for Hawaiian chiefs with the world market system as Americans successively destroyed sea otters, Hawaiian sandalwood, and Pacific whale grounds.

Traditionally the Hawaiian maritime system was part of a kinship mode of production. Three maritime zones were exploited by a complex system which operated to maintain equilibrium. Fishing techniques, knowledge and the social relations of production were all finely-tuned environmental adaptations.
As a result of the new trade opportunities represented by predominantly American interests, Hawaiian chiefs began to ignore their kinship obligations of reciprocity and redistribution which had been the major support of the traditional maritime system. This happened in the context of the creation of a political state and a transition to a tributary mode of production in the islands. In 1819 the religious structure, which had provided supernatural sanction for traditional chiefly obligations, was abolished. Religious mechanisms for restricting access to certain fisheries also disappeared.

After 1820 the continued interest of the chiefs in the world market system affected Hawaiian maritime production in increasingly negative ways. Lacking chiefly support, benthic and pelagic fishing declined. This combined with increased direct taxation of inshore fisheries helped deplete the inshore zone. Together with the privatization or destruction of many fishponds, the depletion led to local fish shortages, even though population had decreased dramatically and fish were being imported into Hawai'i.

In part with the hope of increasing fish supplies, the fisheries were converted to a common property resource by 1851. Konohiki fishing rights, an anomaly to both the American and Hawaiian maritime systems, had been legally created. These changes did not restore maritime productivity to its traditional levels.
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PREFACE

"Don't let foreigners stay here ... the majority of the foreigners are evil-hearted, quick-tempered, eager-for-land people. It will not be wise to let foreigners live here, because you people will become entangled..." George Vancouver to Kamehameha I, 1791. (Kahananui 183)

In 1778 James Cook, agent of what is often called mercantile capitalism, discovered Hawai'i for that expanding world system. His discovery was to greatly benefit the maritime economy and the emerging industrialism of the United States, being born in North America concurrently with Cook's voyage. For the indigenous Hawaiian peoples, the seventy-five years after Cook's discovery was one of profound cultural and environmental change, on a scale previously unknown in their history. Most of this change was due directly and indirectly to Americans seeking sea otter, fur seals, sandalwood and whales in the Pacific, activities which utilized Hawai'i as either a major provisioning base or, as in the case of sandalwood, the source of the product. As in many other indigenous cultures, one effect of this cultural collision was the destruction of the Hawaiian subsistence economy.

America was not the only nation to interact with Hawai'i between 1778 and 1850. England, France, and Russia were frequent visitors, often with official government exploring or naval expeditions. All three countries were to some degree involved in the expanding world-system, and
England in particular gradually came to dominate that system. Most Hawaiian chiefs felt an emotional identification with England from the time of discovery. In terms of political reality, annexation by either England or France appeared to be a more likely possibility prior to 1850.

Yet in material, economic, and ecological ways it was the interaction with the Americans that was crucial. After 1795 Americans were the dominant numerical influence and the dominant trading partner for Hawai'i. American traders, sealers, and whalers represented the major access for the Hawaiian chiefs to the world market system. Americans brought the goods the chiefs desired, and in the process Americans and chiefs collaborated to transform (often unintentionally) the Hawaiian mode of production. This provided the basis for the eventual American dominance of social and political change in Hawai'i.

The major purpose of this study is to examine the changes which occurred between 1778 and 1850 in the maritime component of the Hawaiian mode of production. There are a number of reasons why the sea was chosen as a focus for this research. Many studies on the effect of the expansion of capitalism on indigenous cultures focus primarily on the political and religious changes which occurred in those cultures. Little attention is usually directed to the destruction of indigenous food production systems; yet nothing is more fundamental to a culture. In the case of
Hawai'i, both the land and the sea were major food sources. Precontact Hawaiians are often presented as excellent farmers, which indeed they were. But they were also skilled fishermen, and the major source of protein in the Hawaiian diet came from the sea.

Successful exploitation of the ocean within a restricted island area required specialized knowledge of an environment to which humans are essentially aliens. More than was the case in agriculture, the Hawaiian maritime production system represented a highly skilled and very successful adaptation to relatively fragile ecosystems. This adaptation was itself a major achievement of Hawaiian culture, and will be presented in some detail in chapter three.

No study of culture change can look at that change as entirely externally caused; indigenous cultures were not static societies who passively became the victims of an economically motivated imperialism, as Eric Wolf and K. R. Howe have recently stressed. A society's response to external contact depended to a large extent on the characteristics of that society. Many complex chiefdoms such as Hawai'i quickly developed the political institution of the state, which was then utilized by the ruling elite to direct internal change. In order to understand what happened to the maritime economy in Hawai'i, it is necessary to examine Hawaiian culture as it was in 1778, and particularly the
place of fishing and the ocean environment generally within that culture. This broader examination of Hawaiian culture, and its prehistoric base, will be included in chapter three.

The maritime productive system was affected in negative ways very soon after contact, probably more so than was true of the land. Even earlier than the land, the concept of ocean use and ownership was altered to conform to American attitudes. In 1778 the maritime production system provided most of the protein for a population of around 250,000 people; by 1850 it could not provide adequate fish for a population less than a third of that number. This was for the most part the unintended result of American contact and influence, and how and why this change occurred is the subject of this study. This examination, split chronologically at the year 1819, is presented in chapters four and five of the dissertation.

What ultimately happened to marine exploitation in the Hawaiian economy is part of the story of the transformation of much of the world during the 16th through the 19th centuries from what anthropologist Eric Wolf labels kinship or tributary modes of production to that of participants at some level in a world capitalist system. It was not an accident that American traders and ultimately whalers came to Hawai'i from the 1780s on and became the most influential group of foreigners. In many ways, Americans entered the Pacific because of their success at exploiting (and
depleting) the Atlantic in the process of America's increasing participation in the world market system.

Before 1850, and particularly before 1820, Hawai'i did not appear to have much political significance to America, a fact reflected by the scarcity of United States naval or exploring expeditions to the islands. Yet for the maritime activities of individual New England traders and whalers, Hawai'i was of central importance, an importance it did not have for the traders of other nations. The reasons for this involve the material, economic and ecological relationships that Americans had with the sea. Hence a second purpose of this research is to examine those aspects of the American maritime mode of production which brought Americans to Hawai'i in ever-increasing numbers from 1787 to 1850. The Americans, and the critical aspects of their relationship to the sea, will be examined in chapter two.

The study of how the maritime component of Hawaiian culture changed due to the impact of American culture cannot be addressed without consideration of certain theoretical issues. A particular set of assumptions is already explicit in the specific topic of this research. First, it is assumed that the environmental, material and economic aspects of a culture are critical to understanding how and why a culture changes through time. Second, the impact of the United States on the indigenous Hawaiian culture can best be understood by viewing America as a representative of
an emerging world-system of capitalism which created radical change in the traditional kinship mode of production in Hawai'i. Third, many factors internal to Hawaiian culture and its mode of production facilitated its rapid transformation and entanglement in this world-system. The sources for these theoretical assumptions, definitions and origins of significant terms and concepts utilized in this research, and a brief evaluation of the concepts, terms and theories are presented in chapter one.
CHAPTER ONE
THEORY AND TERMINOLOGY

ON PERSPECTIVE: THE WORLD SYSTEM AND INDIGENOUS PEOPLES

The changes in the Hawaiian maritime economy between 1778 and 1850 did not take place in a vacuum and cannot be studied and understood in a theoretical vacuum. To study a particular set of occurrences using written documents is clearly a historical topic, but as Immanuel Wallerstein has noted it is impossible to analyze these occurrences "without using concepts that imply theorems or generalizations about recurrent phenomena" (The Capitalist World-Economy ix). Such theorems and generalizations in current academic tradition come largely from social science. Without a theoretical base, it is difficult to understand the nature of cultural differences or the process of cultural change, concepts which must be of primary concern in a study such as this one.

If many social scientists in the past have neglected history, and many historians have neglected social science, there are those today who would call for a unified discipline. Anthropologist Eric Wolf has recently noted that "theoretically informed history and historically informed theory must be joined together..." (21). Sociologist Wallerstein believes "that history and science are one subject matter" which he would term "historical social science" (Capitalist World-Economy ix). Historian
Donald Worster has proposed the development of "an ecological perspective on history" by applying the theoretical approach of ecological anthropology to historical topics (2).

While academic tradition changes slowly, the discipline of American Studies already has the potential to become a "historical social science." American Studies tries to integrate approaches and data from many academic fields which focus on a single topic, the United States. Yet this makes it all too easy to see America as a unique phenomena, and not as only one culture in a social world that has been, and still is, evolving. To understand America, and the fundamental ways in which America has influenced societies such as Hawai'i, it is necessary to analyze America as part of this evolving social world.

In understanding this world, a major assumption is that it is necessary to understand the development of the world capitalist system, whose definition and study have been identified primarily with the "dependency school" of theorists (e.g. Wallerstein; Frank). Andre Frank has urged economic anthropologists to realize that this development is the major "theoretical issue."

The central fact is that the worldwide historical expansion of mercantile, industrial, and monopoly capitalism brought all humanity on this particular globe into a single social system. This system... functions... so as to generate socioeconomic development for the few while simultaneously causing degenerative change without development
for the many. [For most societies] ... this process involved more than the destruction or restructuring of their economies ... It also involved the destruction or drastic restructuring of their politics, cultures, and psyches. ("On Dalton" 68)

Eric Wolf has recently urged anthropology in general to realize the importance of this theoretical approach and the existence of a world system of capitalism in its traditional study of "indigenous," "primitive," precapitalist and supposedly "pristine" cultures. Anthropologists traditionally have sought to study cultures which were untouched by industrialism and capitalism. But, as Wolf states, "Europeans and Americans would never have encountered these supposed bearers of a pristine past if they had not encountered one another, in bloody fact, as Europe reached out to seize the resources and populations of the other continents" (18). And, it should be added, the resources of the oceans and islands as well.

Frank has proposed that development and underdevelopment in the modern world are not different phenomena but two sides of the process of capitalism. As capitalism spread from its original center, it extracted the surplus of areas which it encountered, turning these areas into dependent "satellites" of the original "metropolis" or metropolitan center. Hence the spread of capitalism was "the development of underdevelopment," in the words of the title of one of his most important articles.
In Wallerstein's terms, satellites become the periphery and the metropolis the core of a single social system. In the nineteenth and twentieth centuries, according to Wallerstein, "there has been only one world-system in existence, the capitalist world-economy" (Capitalist World-Economy 5). This world-system originated in the late fifteenth and early sixteenth centuries, and is recognized by a global market with a global division of labor, although multiple political and cultural systems exist within it. Wallerstein has traced the historical emergence of this world-system (from the perspective of the core) in minute detail (Modern World System).

A result of this global division of labor was that peripheral areas became producers of various raw materials (at the expense of their own subsistence economies) which were exchanged (an unequal exchange) for goods produced in the core. To Wolf, "what is important about both Frank's and Wallerstein's work is that they have replaced the fruitless debates about modernization with a sophisticated and theoretically oriented account of how capitalism evolved and spread, an evolution and spread of intertwined and yet differentiated relationships" (23).

In addition to Wolf, other researchers concerned with cultural change and the impact of expanding capitalism on indigenous societies have used dependency theory as the basis for their investigations. Two recent examples will be
briefly mentioned here, as they discuss how European and American representatives of the "core" managed to turn indigenous cultures, now minorities within the United States, into dependent peoples.

Historian Richard White recently published the results of his study of how the Choctaw, Pawnee, and Navajo American Indian tribes were changed into dependent peoples at different times in American history. For White, what destroyed these indigenous cultures and permanently impoverished most of the surviving people was not military force or defeat, nor even epidemic disease, though the last was in his view a major contributory cause. Most important however were the "market relations with Europeans and Americans" (317). White might have been discussing Hawai'i when he notes:

Without the ability to resist entrapment in the market and the environmental and social catastrophe this engendered, political independence alone was often irrelevant. Political strength had to guarantee not only nominal independence but also the real ability to deal with Europeans on the basis of reciprocity rather than of market exchange. (319)

A second recent study, by political scientist Noel Kent is specifically concerned with how Hawai'i was incorporated into the world system as a dependent, peripheral area, primarily after 1850. Kent is very critical of some of the classic works of Hawaiian history, notably Ralph Kuykendall, for writing histories which present the past as a sequence
of inevitable and ultimately beneficial events, a "triumph of progress", yet which "tell us nothing about the crucial dynamic of a society in transition" (4). Kent contends that for the last 200 years, Hawaiian development has been "peripheral" in nature, "a reflex of expansionist needs in some metropolitan center" (4). Evidence will be presented to indicate that this statement is also true for the period before 1850.

Both White and Kent, as well as Wallerstein and Frank, focus on how the core subjugated the periphery. Wolf specifically criticizes the latter two for this focus, noting

[T]his leads them to omit consideration of the range and variety of such [indigenous] populations, of their modes of existence before European expansion and the advent of capitalism, and of the manner in which these modes were penetrated, subordinated, destroyed, or absorbed, first by the growing market and subsequently by industrial capitalism. (23)

Unless all this is considered, for Wolf the concept of the "periphery" tells us as little as the term "traditional" society does. In addition, it tends to portray the people of the periphery as similar helpless, passive victims of the capitalist core.

Howe has recently criticized other Pacific historians for their portrayal of islanders as "objects of European initiatives" rather than "subjects in themselves" (xiii). He notes (and Wolf would certainly agree) that "processes
and developments in many precolonial culture contact situations were greatly influenced not by European decree but by the initiatives of various Islanders and by their respective social and political arrangements" (xv). This is as true for Hawai'i as for any Pacific culture or other indigenous society.

In this study, the change in a small but vital part of Hawaiian culture is the focus. As will be seen, there was nothing passive about the Hawaiian response to contact with the world market, and due to the nature of Hawaiian culture in 1778, many Hawaiians were as much the agents of change as any trader or whaler or missionary. Yet it is equally true that the Hawaiians as well as the Americans were increasingly entangled in an evolving world social system whose direction was not within the conscious control of any individual or any culture. Both perspectives, that of Hawai'i as "victim" of a world-wide evolutionary process, and that of Hawai'i as active participant in the process of cultural change, are necessary to understand what happened in Hawai'i between 1778 and 1850.

Two of the major theoretical assumptions guiding this research have been briefly discussed. The third assumption, that environmental and economic aspects are central to understanding cultural change, has its origins in ecological anthropology. Largely missing from Wolf, Wallerstein and Frank is any perception of the expansion of the world market
system as the expansion of a system which dealt with the environment and natural resources in particular ways. With this perception, one of the most important changes caused by this expansion was the change in indigenous adaptations to local environments. The focus of this research, the maritime production system of Hawai'i follows directly from this assumption, and its origin as well as certain related concepts need to be discussed in more detail.

ENVIRONMENT AND EXPLANATION

Social science has from its inception sought to develop classification schemes for different societies and for internal structures within societies which could be used to understand cultural change and explain similarities and differences between cultures. Several of these schemes which emphasize materialist, economic, or ecological criteria have been adapted for this particular study, and will be discussed. The different schemes are useful as heuristic devices, as sources of concepts and terminology. All are roughly evolutionary and can be used to classify cultures. While this may be useful, it is all too easy to reify schemes of social classification, leading to fruitless debates on the exact classification of a culture at a particular time. In this study the process of economic and material change is the focus and more than one theoretical
approach will be used. An attempt to roughly correlate the different schemes discussed in this chapter is included as Figure 1.

Anthropologist Marvin Harris has created a classification scheme that focuses primarily on the technology of production, and he has integrated it with an ecologically based view of cultural change. Harris is greatly influenced by and is part of the movement termed cultural ecology or ecological anthropology. Cultural similarities are assumed to be primarily due to similar technologies dealing with environments imposing similar limitations. Cultures are hence classified by their "mode of production", and Harris has a very specific definition for mode of production.

The technology and the practices employed for expanding or limiting basic subsistence production, especially the production of food and other forms of energy, given the restrictions and opportunities provided by a specific technology interacting with a specific habitat. (Cultural Materialism 52)

For Harris, the mode of production is the key to understanding a culture, including cultural differences, similarities, and change. Included in a culture's mode of production would be the technology of subsistence, the techno-environmental relationships, the specific ecosystem, and work patterns. He recognizes five modes of production: hunting and gathering, horticulture, pastoralism, intensive agriculture and industrialism (Cultural Antropology). With
the exception of pastoralism, Harris views the other four categories as a developmental sequence, though by no means an inevitable or necessarily progressive one. Hawai'i, as all Polynesian cultures, would be classified as a horticultural society using this approach, although one bordering on intensive agriculture.

The influence of cultural ecology is clearly seen in Harris's inclusion of the ecosystem and techno-environmental relationships in his concept of the mode of production. The influence is equally clear in his definition of a "mode of reproduction": "the technology and practices employed for expanding, limiting, and maintaining population size" (Cultural Materialism 52). The mode of production and the mode of reproduction together make up a culture's infrastructure, and it is the infrastructure which determines the other aspects of a culture. These other aspects are to be found in the structure (domestic and political economy), and superstructure (art, music, rituals, sports). From this, Harris arrives at a basic methodology for investigating cultural change: the cause of any cultural change (in social or political structure, religion, etc.) should always be sought first in the culture's infrastructure. This specific approach is called by Harris "cultural materialism" or "infrastructural determinism" (Cultural Materialism).

For Harris, this is a reworking of an insight credited to Karl Marx: "The mode of production in material life
determines the general character of the social, political, and spiritual processes of life. It is not the consciousness of men that determines their existence, but on the contrary, their social existence determines their consciousness" (qtd. in Cultural Materialism 55). For Marx, however, as critics of Harris have noted, the most important aspect of a culture's mode of production were the social relations of production, an area assigned by Harris to the structure (e.g. see Friedman for an extremely critical evaluation of Harris).

In the theory of cultural materialism, religious, social and political characteristics are viewed as adaptations to a particular habitat, as having adaptive value under a specific set of environmental, technological, and demographic circumstances. A culture changes (ultimately from one mode of production to another) because of the problems created as people attempt to maintain an existing standard of living in the face of a rising population. Although all cultures have methods of limiting population growth (until recently primarily by abstinence, abortion and infanticide) the costs inherent in such methods caused cultures to intensify production where possible rather than to maintain a stable population size (Cannibals and Kings).
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<td>Kinship</td>
<td>Chiefdom</td>
<td>Stratified</td>
<td>Equilibrium</td>
</tr>
<tr>
<td>Horticultural</td>
<td>Kinship</td>
<td>Tribe</td>
<td>Ranked</td>
<td>Equilibrium</td>
</tr>
<tr>
<td>Hunters/Gatherers</td>
<td>Kinship</td>
<td>Band</td>
<td>Egalitarian</td>
<td>Equilibrium</td>
</tr>
</tbody>
</table>

Figure 1. A Correlation of Classification Systems

Intensification of production, while temporarily maintaining or raising living standards, will inevitably deplete the environment, ultimately lowering the standard of living. In continuing efforts to maintain the standard of living production will again be intensified, causing depletion, causing further intensification, until finally, in specific kinds of environmental circumstances, the culture may change to a new mode of production. In other environmental circumstances the change to a new mode of production may be impossible, and if geography or the presence of powerful neighbors prevents expansion into new territories, the culture may be forced into a costly
equilibrium, maintaining a stable population size within a given mode of production.

Harris' model is in many respects a very simplistic explanation for both cultural change and cultural variation. Cultural materialism presents a self-contained and basically internal view of cultural change, placing primary emphasis on population growth and its effect on the whole ecological system of a culture. Regardless of problems with definitions (and a broader definition of mode of production will be used in this research) the theory is valuable in understanding why Hawaiian culture was as it was in 1778, since internally generated change had to be the primary factor in its development. In addition, the model may also provide assistance in understanding why Hawaiian culture changed so rapidly with western contact.

In addition to Harris, another model from cultural ecology is that presented by John Bennett, who uses the concept of cultural and ecological equilibrium and disequilibrium as the means to conceptualize basic differences and similarities in cultures. He distinguishes between societies in equilibrium with their environment and those in disequilibrium, and presents a variety of associated criteria (See Figure 2). Since in general precontact Hawai'i meets the criteria for a culture in equilibrium, just as American characteristics are consistent
<table>
<thead>
<tr>
<th>Trait</th>
<th>Equilibrium</th>
<th>Disequilibrium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Small, controlled</td>
<td>Large, expanding, Weakly controlled</td>
</tr>
<tr>
<td>Environmental Contact</td>
<td>Direct contact by maximum number of people</td>
<td>Direct contact by minimal number of people</td>
</tr>
<tr>
<td>Range</td>
<td>Restricted to local needs</td>
<td>Resources available from external sources</td>
</tr>
<tr>
<td>Needs/Wants</td>
<td>Close to minimal; defined largely by physiological needs</td>
<td>Maximal; expanding; defined primarily by cultural wants</td>
</tr>
<tr>
<td>Technological Capacity</td>
<td>Low</td>
<td>High; new forms of energy found in economic organization and fossil fuels</td>
</tr>
<tr>
<td>Environmental Effects</td>
<td>Minimal; controlled resource use</td>
<td>Maximal; promotion of resource use and environmental depletion</td>
</tr>
</tbody>
</table>

Source: Modified After John Bennett (139)

Figure 2. Equilibrium vs. Disequilibrium
with a society in disequilibrium, Bennett's concept of an "ecological transition" is of particular relevance.

In part, Bennett defines the "ecological transition" as "the development of an anthropocentric orientation toward the natural world" which he believes began in Europe at the same time as Wallerstein sees the emergence of a capitalist world-system: the 16th century (Bennett 5). Accompanying the new orientation was the discovery of new sources of energy, in economic organizations and technology as well as fossil fuels (138). Cultures in equilibrium manage and use local resources for sustained yield without significant environmental deterioration, and both population and individual wants remain low. Cultures in disequilibrium seek resources "wherever they are to be found," and "little discipline exists over the use of either home-range or externally-derived resources" (137-138).

The field of cultural ecology can thus provide some ideas which help to conceptualize the expansion of the world market system as an "ecological event," to use Worster's term (18). This is something that Wolf and Wallerstein do not really include in their approach. In order to ultimately "unite" these various approaches in a way that will provide a basis to examine the Hawaiian maritime production system, it is necessary to first discuss some anthropologists who have related environment to the development of political structure.
The Concept of Chiefdoms

Elman Service is one such anthropologist. For Service, the basic characteristics of a culture were rooted in its political system or government. Using this as his focus, he classified cultures into sociopolitical types which also represented an evolutionary sequence: bands, tribes, chiefdoms, and states (Primitive Social Organization). In recognizing and defining the chiefdom as an intermediate form leading to the state, Service helped to generate research on the nature of historically known chiefdoms and the evolution of some of them into the political state.

For Service as well as others who have studied chiefdoms, Hawai'i in 1778 represents the highest possible evolution of the chiefdom (e.g. Sahlins, Stone Age Economics; Kirch, Evolution). Chiefdoms grew out of egalitarian bands and tribes, and preceded the development of known "primitive states," of which Hawai'i (ca. 1810) is one. According to Service primitive states of similar type probably "preceded the flowering of the archaic civilizations" (Origins of the State 16). It is because primitive states represent this presumed earlier transition from chiefdom to state in the history of civilization that their study has such theoretical importance in anthropology. Because this transition probably took place in Hawai'i between 1778 and 1810, an understanding of the concepts of chiefdom and state is critical for this research.
Chiefdoms represent a "level of sociocultural integration" which in certain important respects has more in common with states than with tribes or bands. Whereas in tribes specialization in production and the redistribution of produce are sporadic occurrences, they are continuous and important in chiefdoms. Service emphasizes that chiefdoms are redistributional societies, with some form of a permanent central agency of coordination. Not only are economic activities coordinated by this central agency, but religious, social, and political activities as well (Primitive Social Organization 134).

This centralized society has environmental origins, for "the rise of chiefdoms seems to have been related to a total environmental situation which was selective for specialization in production and redistribution of produce from a controlling center" (Primitive 133-134). Based on the distribution of historical chiefdoms, the appropriate environment probably was one with diverse ecological zones and a variety of natural products, suited to a variety of agricultural crops. Specialization and central direction are viewed as being important contributors to an increase in production. As will be discussed in chapter three, one of the central issues in understanding the Hawaiian economic system in 1778 is whether or not Hawai'i did indeed increase production by a centralized system of production and redistribution.
A result (not for Service a cause) of this centralized system is the development of ranked, hereditary status. Unlike egalitarian bands and tribes, "chiefdoms are profoundly inegalitarian" (Prinicipal 140). Chiefdoms tend to be pyramidal or cone-shaped societies structurally, with kinship units that operate as miniature chiefdoms. Each unit has a head who collects goods to be passed up to a higher chief, and receives and redistributes goods to his group (142). To designate the different status levels of chiefs, various sumptuary regulations (distinctive dress, food, recreation, ritual position, etc.) are found in chiefdoms (147). Yet Service maintains this does not create true classes since there are no true economic differences between groups. "Sumptuary rules ... do not have their origin in economic self-seeking; the classes are in origin social and political, not economic" ("Classical and Modern Theories" 150).

In certain ways, chiefdoms as viewed by Service resemble tribes and bands rather than states. He classifies chiefdoms as examples of kinship society, rather than "civil" society. Chiefs may hold an advantage of force, but do not hold a monopoloy of force, as is found in a true state. "In a chiefdom we find one essential of true law, the authority structure that can act as a third party above the familistic level. But chiefdoms lack the coercive physical
sanctions related to the monopoly of force practiced by states" (Origins 86).

For Service, the state means "that the basis of political organization is repressive physical force ... government [is] a bureaucracy instituted to rule a populace by right of authority" (Origins 10). Although he views the actual use of force as the failure of authority, nonetheless the fact that law and government are backed by force, rather than by public opinion, is the key to understanding the state.

Service proposes an "integrative" approach to the origin of the state, noting particularly the "organizational benefits" derived from this type of political structure. The state "legitimized itself in its role of maintaining the whole society ... Political power organized the economy, not vice versa. The system was redistributive, allocative, not acquisitive" (Origins 12). Essentially, redistributive systems (one of the central functions of chiefs in Service's view), ultimately leads to centralized power as a society comes to depend more and more on the continuity of redistributive leaders (Origins 75).

Social classes or strata are recognized by Service as coming into existence at the same time as the state. All known states, primitive or otherwise, had at least two strata, the governors and the governed, but he does not see the evolution of a monopoly of power on the part of the
governors as being due to an attempt to solidify or increase any economic advantage.

Nowhere ... even in the simplest, most primitive cases, were these strata based on differences in wealth, forms of property, or 'differential access to strategic resources.' The difference was in political and religious power, and this power was so absolute that it needed no buttress such as economic advantage. ("Classical and Modern Theories" 32)

Not all would agree. Anthropologist Jonathan Haas, in a recent study of theories as to the origin of the state, notes that Service is a modern advocate for a particular view of state origins termed "integration theory," as opposed to "conflict theory." The debate between conflict and integration theory in terms of the origin of the political state not only has a long history in social science, but can be clearly traced back to ancient Greek and Chinese philosophers. More recently, Hobbes, Locke, Adam Smith and Herbert Spencer (as well as Service) can be classified on the side of the integrationists. Advocates of conflict theory include Rousseau, Lewis Henry Morgan, Marx and Engels, and in anthropology V. Gordon Childe, Leslie White, and most recently Morton Fried (Haas 20-33).

Briefly, integrationists argue that "the governing institutions of the state first developed as integrative mechanisms to coordinate and regulate the different parts of complex societies." Those associated with conflict theory argue that the "governing institutions of the state
initially developed as coercive mechanisms to resolve intrasocietal conflict arising out of economic stratification" (Haas 20).

In modern anthropology, Morton Fried is identified as the major "opponent" of Service's view. Taking social status differences or ranking as his basic criteria, Fried has presented an evolutionary sequence for the development of political organization which moves from egalitarian, to ranked, to stratified societies, and ultimately, to the political state (Fried, *Evolution of Political Society*).

For Fried, inequality emerges with ranked societies and within an economic framework. The underlying causes or stimuli to the emergence of ranking are "ecological demography" and the "emergence of redistribution." (**Evolution** 183). Ultimately, the ranking becomes true stratification, where "members of the same sex and equivalent age status do not have equal access to the basic resources that sustain life" (**Evolution** 186). For Fried, stratification, or some form of "differential access to basic resources, precedes the emergence and certainly the crystallization of sophisticated political institutions" such as the state (**Evolution** 212).

The monopoly of power of the state has "as its central task the protection (and often extension) of the order of stratification" ("The State" 36). In brief, the protection and extension of unequal access to resources of a specific
group led to a monopoly of power, the state. Once established, the state "sooner or later caused transformations in all other sociocultural aggregates with which it came into contact" ("The State" 36).

While these debates on state origin, and whether it was preceded or followed by true economic stratification of the society, are primarily focused on the emergence of "pristine" states, it is clearly a relevant concern. Hawai'i is usually considered a "secondary" state, one which emerged due to contact with other political states. If in 1778 it was a stratified society in Fried's terms, with unequal access to basic resources, this is of critical importance to understanding Hawaiian interaction with one of those basic resources, the ocean. If the state emerged in Hawai'i as a ruling elite attempted to maintain and increase access, perhaps to new resources, that too is relevant to understanding the way Hawaiian culture was transformed in the period prior to 1850.

The above models and schemes are not necessarily mutually exclusive. Wallerstein and Frank are concerned almost entirely with events after the 1600s and with the spread of a world-system of capitalism. Bennett provides an ecologically based model to understand the environmental as well as cultural effects of that spread. Harris, Service, and Fried are primarily concerned with models and classification that are most useful in tracing precapitalist
and/or preindustrial world development. Service and Fried both recognize that an industrial state is different from a preindustrial state, either pristine or secondary.

Chiefdoms and the Social Relations of Production

Eric Wolf is one anthropologist who has tried to combine the insight of dependency theory with the traditional anthropological insights into precapitalist, preindustrial cultures. Wolf attempts to set up a more successful model to understand how indigenous cultures were drawn into the larger system of capitalism "and became its agents" (23), and hence is highly compatible with the goals of this research. In investigating what he calls the "people without history," he is specifically concerned with how North American cultures were affected by the fur trade and African cultures by the slave trade. Yet his analysis of why and how certain types of indigenous cultures so quickly changed their mode of production is extremely useful in looking at Hawai'i.

Like Harris, Wolf uses "mode of production" as the basis for his classification and analysis, but he defines this concept much differently, though just as narrowly, as Harris. To Wolf, a mode of production is "a specific, historically occurring set of social relations through which labor is deployed to wrest energy from nature by means of tools, skills, organization, and knowledge" (75). He defines a "kin-ordered mode," a "tributary mode," and a
"capitalist" mode of production, and although he does not claim that this represents any evolutionary sequence it is clear that historically the kin-ordered mode was the oldest, the capitalist mode the most recent.

The capitalist mode came into existence when the "holders of wealth" were able to acquire the means of production" (specifically tools, labor, resources, and land) and could set the terms of access to all those who wished to operate them. People who are denied access must then bargain with the owners of the means of production in order to operate them for a wage. In Wolf's terms, wealth is not in and of itself capital as long as it is acquired simply by taking products from producers and making profits by selling them. In other words, for Wolf, what is often referred to as the stage of mercantile capitalism (which for Frank and Wallerstein represents the beginning of the capitalist world-system) does not represent the capitalist mode of production.

The tributary mode of production exists wherever "the primary producer ... is allowed access to the means of production, while tribute is exacted from him by political or military means" (80). If environmental conditions permit power to be centralized by the control of an important part of the process or production, such as water for agriculture, this would be Marx's Asiatic mode; if the strategic elements of production remain in local hands the result is Marx's
Feudal mode. In either case, whether centralized or local, the political state and class stratification exist.

In the kin-ordered mode, social labor is "locked up" or "embedded" in kin relationships. Through kinship ties people have rights in the social labor of others; how such rights are established and exercised vary widely in different cultures. Wolf's kin-ordered mode closely resembles the "domestic mode of production" defined by Marshall Sahlins as a result of research in different Polynesian societies. Kin-ordered societies are the "primitive cultures" of anthropologists, and in them economy is not a separate, specialized organization, but "is something that generalized social groups and relations, notably kinship groups and relations, do ... the armature of the economic process is provided by groups classically conceived as 'noneconomic'" (Sahlins, Stone Age Economics 76).

In general, Wolf sees two variants of the kin-ordered mode. In the first, most commonly found in hunting and gathering bands, access to resources is not restricted. In the second, specific kinship relationships, or genealogies, are used to restrict access to resources to those of the appropriate kinship. This variant would be the most common in horticultural chiefdoms (See Figure 1).
Although Wolf does not specifically relate these variants of the kin ordered mode to ecological conditions and population pressures (as Harris and to some extent also Service and Fried do), the implication is clearly that the differences do represent attempts to intensify production. When access to resources is restricted by kinship, genealogies become critical, and status differences between junior and senior lines of descent from a common ancestor may develop. Sahlins has more clearly seen these developments as mechanisms of intensification, raising the productivity of the society. He contends that chiefs, whatever else they may do, tend to mobilize the household economy to a "larger social cause" (Stone Age Economics 101).

Sahlins was also one of the earliest scholars to note that the most productive societies in Polynesia were those with the highest degree of stratification or social status differences (Social Stratification). These same societies also have the largest and most frequent redistributive systems. Although Sahlins had originally assumed that high productivity was necessary for redistributive chiefs to exist, he later concluded that the statement should really be reversed: a high degree of social status differences and the existence of large redistributive networks is a means in some environments to raise productivity (Stone Age Economics 101). In the case of Polynesia, cultures inhabiting islands
with a diversity of ecological zones seem to have been able to intensify production by means of redistributive chiefs. These chiefs however were still only superior kinsmen of the food producers, and ultimately had certain kin obligations to the food producers. Chiefs, in other words, were still "embedded" in the kinship system.

It is precisely because the development of political power is limited or restricted by kinship obligations (as well as ultimately by the environment) that attempts to exercise political power are the stress points of the kin-ordered mode. Wolf in fact calls this their "Achilles' heel" (94). Internal conflict between junior and senior descent lines, or between descent lines that are rising in importance and those that are falling, may become endemic in these societies. A chief may attempt to obtain access to larger quantities of resources through warfare; warfare places extreme stress on the producers and in any event the resources achieved must then be redistributed. A chief has no independent control over production since the social labor of production is organized by kinship.

A chief who pushes too hard in terms of centralizing power will find that other descent lines may challenge him and find sufficient followers to check his attempts; in any event, when a chief dies there may be numerous claimants from similar descent lines. Genealogies can always be modified by those who are successful at manipulating the
redistributive system. According to Wolf, "To break through the limitations of the kin order, a chief must gain independent access to reliable and renewable resources of his own" (94). Contact with cultures in a tributary or capitalistic mode of production may enable redistributive chiefs to obtain access to these independent resources. Wolf could have been describing what happened in Hawai'i after contact when he wrote:

"Chiefs can then employ these external resources to immobilize the workings of the kinship order. This is why chiefs have proved to be notorious collaborators of European fur traders and slave hunters on two continents. Connection with the Europeans offered chiefs access to arms and valuables, and hence to a following outside of kinship and unencumbered by it." (96)

Wolf contends that the types of internal conflict generated by redistributive chiefs in a kin-ordered mode are often a source of change in the society, since fissioning may result, and such groups may come into contact with cultures that are tributary or capitalistic states (95-96). If due to geographic isolation fissioning groups do not make such contact, redistributive chiefdoms with long histories of internal political discord (which can be interpreted as population pressures pushing against resources) might change very rapidly when contact finally does occur with cultures having another mode of production.

The concept of economically important redistributive chiefs indicates that the social relations of production
within a society must be part of the definition of mode of production. Yet to limit the concept of mode of production to include only social relations does not help to understand productive systems as systems with adaptive relationships to specific environments via particular technologies. To ignore the environmental and material aspects of the way a society provides for its basic subsistence does not help in understanding indigenous cultures as vital, active and ecologically adaptive entities. In addition, to present the spread of a world-system of capitalism as the entrapment of other systems of social relations of production into the capitalist mode makes it difficult to recognize that the spread of this mode represented, among other things, an ecological transformation in terms of human interaction with their environment.

Mode of Production Defined

Wolf's terms for the different modes of production will be used in this research, together with his definitions for the social relations of production. However, the term "mode of production" or production system will be given a broader definition which combines the approach of Wolf with Harris and even John Bennett.

Anthropologist Maurice Godelier has presented a definition that is broader yet not incompatible with the ecological insights of Harris or the more strictly Marxist approach of Wolf. Godelier considers a culture's
infrastructure or mode of production to consist of a series of three "social and material conditions that enable a society's members to produce and to reproduce the material conditions of their social existence" (763).

The first part of the infrastructure consists of the specific ecological and geographical conditions of the society. Secondly are what Godelier calls "the material and intellectual means that the members of a society implement, within the different 'labour' processes, in order to work upon nature and to extract from it their means of existence, thereby transforming it into a 'socialized' nature" (763). By intellectual means Godelier is referring to the knowledge that a society has of nature, as well as the "body of technical processes, of rules governing the manufacture of tools, [and] of rules governing the use of the body in work" (764). With the exception that Harris would relegate "intellectual means" to a culture's superstructure, there is thus far considerable agreement with Harris.

In the third part of the definition of infrastructure Wolf would find complete agreement. This consists of the "social relations of production," relations which assume any or all of three functions:

[1] determining the social form of access to resources and to control of the means of production; [2] allocating the labour force of a society's members among the different labour processes which produce its material base, and organizing these different processes; [c] determining the social form of redistribution of the product of
individual or collective labour and, consequently, the forms of circulation or noncirculation of these products. (763)

In Godelier's approach the concern is with function: thought and kinship patterns may function as part of the infrastructure in some societies. He would certainly agree with Wolf and Sahlins that in some societies the locus of the relations of production is to be found in the relations of kinship. In other cultures, such as American culture, the relations of kinship are clearly part of the superstructure and do not form part of the relations of production.

Fundamentally, the topic to be examined here is the impact of the maritime aspect of the American infrastructure or mode of production, upon the Hawaiian maritime production system, using Godelier's broad definition of mode of production. In order to do so, terms, concepts, and insights of all authors discussed in this introduction will be used.
CHAPTER TWO
AMERICA AND THE SEA

INTRODUCTION

Europeans first came to North America primarily as a result of the expanding markets and trade relationships that mark an early stage in the development of a world-system of capitalism. The European discoverers were impressed with the seemingly infinite natural resources they found on the land and in the adjoining ocean, and accounts of the marketable commodities to be found predated the first attempts at colonization (Cronon 20).

From the beginning America possessed a capitalist mode of production and displayed all the characteristics of a society in disequilibrium. This is clearly reflected in the American approach both to ocean and land resources. Since it was the American approach to the ocean which ultimately brought New Englanders to distant Hawai'i, the focus of this chapter is on America and the sea. Yet for most colonists the seemingly endless land of North America was the major attraction.

While the timber on the land was an attractive resource for people coming from an already deforested Europe, in America land itself become the most important commodity. Once freed by persuasion or force of Indian claims, land could be bought and sold and potentially large profits obtained. Thomas Cochran has concluded that even the early
colonial farmers were businessmen in the capitalistic sense, despite more amenable myths about yeomen, subsistence farmers. "The business activity that most differentiated all American agriculture from that of Europe was the acquisition of land in fee simple and its cultivation with a view to resale." Cochrane's studies of prerevolutionary land transactions led him to the conclusion that American farmers were "rising entrepreneurs engaged essentially in producing land values" (6-9).

In order to produce land values, Americans radically altered the land, introducing European animals and plants which unlike the horticultural practices of the indigenous people required extensive forest clearing. The amount of land needed far exceeded the requirements for subsistence agriculture, for from the European point of view the eastern seaboard could not produce all essential goods needed by the farmers. Specialized production and trade were significant from the beginning, and left no room for indigenous cultures with incompatible modes of production.

Francis Jennings for instance, has noted that as the Europeans entered Pennsylvania they did not opt to become yeomen subsistence farmers. If they had "there would have been land enough, and to spare, for the Indians as well, and their hunting and fishing abilities could have fitted neatly into such a mode." Instead the new Pennsylvania farmers were soon shipping large cargoes of wheat to the West Indies
(supporting the slave-based sugar plantations) and also to Europe. To do this and feed themselves as well, large quantities of land were required, and as a result, the Indians could not stay (Ambiguous Iroquois 273-274).

Goods needed by the colonists included woolens and iron which they could not produce. Obtaining these articles was dependent on a fish-based West India trade to which the Yankee farmers contributed not only wheat, but barreled beef and pork, lumber and staves, bowls, axe-helves, and similar items. Historian Samuel Morison has concluded that "The influence of West-India trade and the fisheries penetrated the remotest frontier settlements of New England" (Maritime History 18).

The development in North America of this market-embedded agriculture was devastating not only to the indigenous cultures but also to the environment. The ecological devastation of New England has recently been documented by William Cronon in his book Changes in the Land. Cronon noted that although extensive forest clearing, grain production and pastoralism would have produced ecological changes regardless of the economy in which they were embedded, it was the expanding markets and trade relationships of a developing European capitalism which had brought Europeans to America in the first place (163).

Ultimately it was the expanding markets and trade relationships of a developing American capitalism which
carried Americans to Hawai'i. The way Americans used ocean resources, particularly fish and sea mammals, was a critical part of this expansion and development.

Economist H. Scott Gordon has noted that Americans and Europeans viewed the ocean as a "common-property natural resource ... owned in common and exploited under conditions of individualistic competition" (124). In Gordon's analysis of the way in which capitalistic societies use fisheries, common-property natural resources are "free goods" for the individual in search of profit, and as a result there is no motivation to restrict their use. "Wealth that is free for all is valued by none because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another" (135).

Americans arrived in Hawai'i in large part due to the inevitable consequence of such an approach, particularly as it involved the marine mammals such as whales, seals, and walrus. As these commercially important animals became scarce in the bays and offshore islands of New England, Americans were forced to move further and further offshore. When whales and other sea mammals became scarce and sometimes extinct in the north Atlantic, Americans began to monopolize the south Atlantic. When whales became scarce there, they were tracked around the Cape of Good Hope into the Indian Ocean and around Cape Horn into the great Pacific. Fur seals and sea elephants were hunted on islands
in the south Atlantic until populations were decimated. As the populations dwindled, the search for new rookeries led the sealers further and further south off Antartica, around the Horn and the Cape, and into the Pacific from both directions. Sea otters off the Pacific northwest coast of America were hunted to local extinction, and then the ships went south to repeat the process off California. Only fish seemed to exist (until the twentieth century at least) in sufficient numbers to survive an exploitation system embedded from the beginning in the market.

The search for fish, whales, fur seals and sea otters was economically motivated and clearly tied to the expanding world-system of capitalism. The proximity of some of the greatest natural habitats for fish in the world (the Newfoundland and Georges Banks), plentiful timber for ship-building, and a land and environment unsuited to the production of much in the way of marketable resources led the American northeast to the sea for both markets and commodities. Ultimately the sea provided the basis for capital to finance ever longer and costlier voyages to find new commodities. By 1800 the sea had provided the basis for capital accumulation which was to enable New England and the northeast generally to develop industrially and assume a solid position as a metropolis or core area in the capitalist world-system, one of the few areas in the Americas to do so (Frank, Dependant Accumulation Chapt. 3).
In analyzing America's relationship to the sea in more detail, it is clearly New England specifically and the northeast generally which will be discussed. Men from these areas were the fishermen, the traders, the sealers, and the whalers whose methods and motives of ocean exploitation finally brought many into contact with Hawaiian culture. How and why this happened will be examined in some detail in the remainder of this chapter.

COLONIAL AMERICANS AND THE ATLANTIC

Fish first brought Europeans to North America's shores. Basque, French, and even German fishermen had discovered the Grand Banks off Newfoundland in the 15th century, and had probably discovered the continent of North America accidentally before Cabot did so officially for England in 1497. Cabot immediately reported on two of New England's greatest marketable resources: he saw dense forests with trees suitable for the masts of ships, and seas with codfish so plentiful that his men were able to haul them out with baskets let down with a stone inside (Albion et al. 15; Innis 11).

Throughout the 16th century, Basque, Portuguese, French, and some English fishermen sailed for the Grand Banks and became increasingly familiar with the northeast coast as they dried their fish on shore. By 1575 over 300 ships annually fished the Grand Banks, a number which had
swelled to 650 by 1600. The English became the dominant exploiters of this fishery by the latter half of the 16th century.

In 1614, an English expedition under Captain John Smith was sent to explore the area. With him were men experienced in whaling as well as fishing. Smith's attempts to catch whales off Maine were not successful and he reported "We found this Whale-fishing a costly conclusion; we saw many and spent much time in chasing them, but could not kill any" (qtd. in Dow 5).

Smith was more successful with fishing. He dried cod fish on an off-shore island which was eventually sold for a profit of 1500 Pds. in England and Spain. It was his recommendation that his countrymen should cut costs and save time by basing their fisheries in New England and combining them with ship-building and the fur trade (Morison, Maritime History 9).

That New Englanders were able to build a wealth from fishing was due more to the nature of the fishing grounds than the people who settled there. All great fishing grounds must be in relatively shallow waters, since only in areas near land or over continental shelves will dissolved minerals and organic carbon be found in large enough quantities to support commercially useful quantities of pelagic (surface) fish. Bottom, or benthic fish, can find food only in shallow areas where light can penetrate,
usually less than 250 fathoms (1500 feet). In addition, the stormy high and higher middle latitudes tend to be more productive than calmer tropical areas, for by frequent disturbances and mixing of the bottom by storms more plankton are produced near the surface (Ackerman 7). These plankton provide the food for the pelagic fish species, as well as for the larvae of benthic species.

Within three days sailing from New England's coast are some 115,000 square miles of water less than 200 fathoms deep, and 70,000 square miles of this are less than 50 fathoms. It includes the Grand Banks, some 40,000 square miles just southeast of New Foundland, the 10,000 square miles of the Georges Bank east of Massachusetts, and various smaller banks, many off Nova Scotia (Ackerman 10). It is a stormy area, with plentiful plankton, and its fish are easily preserved by salting and drying.

From the beginning the cod was the mainstay of the fishing industry. A bottom feeder usually found between 20 to 70 fathoms, cod consume a variety of invertebrates, and are found widely distributed throughout the banks. Averaging (in the early 17th century) from 15 to 20 pounds, it was still possible before the end of the 16th century to discover new grounds with cod as large as 200 pounds; today the average weight of a cod from the Grand Banks is about six pounds (Mowat 168). While cod continued to be the most
important fish through 1850, other available fish were taken, including haddock, halibut and the pelagic mackerel (Ackerman 23-30).

Most of these fish were caught on baited hooks, and hence the availability of a suitable bait was a potential problem. The various rocky islands off the coast of New England and around the Gulf of St. Lawrence provided a ready solution in the form of birds. Various species of sea bird, and at least one flightless species, lived by the millions all along the eastern seaboard, and were easily killed by the fishermen. These birds became the prime source of bait for a cod fishery fleet that even in the early 1600s caught 30,000 fish per day. Bird populations started an immediate decline, resulting in local, and for a few species absolute extinction by the early 19th century (Mowat Chapt. 2).

The other important "fish" sought was the whale, of which several different species were found in the north Atlantic. As early as 1372 Basque, who had probably started whaling at least a century earlier, were taking whale off the Grand Banks, and by the early 1400s they were northwest of Iceland (Spence 16). Eventually the whalers discovered large numbers of the animals off Spitsbergen, an island northeast of Greenland in the Arctic, and by the early 1600s English commercial companies were becoming more and more involved in Greenland whaling. Although the Basques had long before developed techniques for rendering the oil from
the whales on board ship, as long as it was possible the preference was to tow the whale ashore to a Spitsbergen port for processing. Shortly after 1600, as many as 12,000 men might be on shore for the season at Spitsbergen (Spence 34).

Whales were found in all the bays and harbors of New England and eastern Canada. A mid-16th century mariner wrote that one of the major dangers in sailing near the coast was whale collisions (Mowat 211). These coastal whales were primarily the black right and the Atlantic grey whale. Less than 60 feet long, both were slightly smaller than the Greenland right or bowhead frequently hunted off Spitsbergen. Also present in the North Atlantic was the 66 foot sperm, although it was rarely seen close to shore (Lockley 144-146). Other whales were present in the North Atlantic, but these four had the required characteristics for early whalers: they were slow, could be killed with hand-held harpoons, had large quantities of valuable oil, and floated when dead (Mowat 212).

The whales and the fish, with land resources of timber and fur, were a powerful attraction to the English whether they were fishermen or not. When the Mayflower anchored off Cape Cod in 1620, there was some debate as to whether the settlers should remain or try to go elsewhere. They decided to remain, in part because of the potential for whaling.
They recorded that "large whales of the best kind for oil and bone came daily alongside and played about the ship (qtd. in Dow 6).

The original founders of Massachusetts Bay Colony may indeed have hoped to lay an economic foundation of large landed estates worked by tenants and hired labor, as Morison asserts (Maritime History 11). Nonetheless, the royal charter under which it was settled guaranteed to the colonists the rights to fish with no restriction. A later charter confirmed the rights of the colonists to "free Libertie of Fishing ... in the Seas thereunto adjoyning and of all Fishes Royall [whales] ... and other Fishes of what kind or nature soever" (qtd. in Dow 6). Regardless of what had originally been contemplated New Englanders were quickly forced to become fishers and whalers.

For a short time, immigration into Massachusetts enabled the colonists to survive by producing corn and raising cattle. When immigration decreased in 1641 Governor Winthrop wrote: "All foreign commodities grew scarce, and our own of no price. Corn would buy nothing ... These straits set our people on work to provide fish, clapboards, plank, etc., ... and to look out to the West Indies for a trade ..." (qtd. in Morison, Maritime History 11-12).

Cod fishing was already carried out as a large scale capitalistic enterprise from England, with many investors and frequently borrowed capital. A large part of England's
catch was sold to foreign consumers in continental Europe. As a result subsistence fishing was not contemplated, nor was it possible. Fortunately for New England, not only did it have on hand timber for ship-building and trade, it was also closer to an important developing market, the slaves of the West Indies sugar and the Virginia tobacco plantations.

Thus began the "triangular trade" which in Frank's words allowed the "peculiarly privileged participation of New England in mercantile capitalist development" (World Accumulation 193). New England shipped dried and salted fish to feed the West Indies slave population. In general, only the lowest grade of fish were sent, along with other items produced by the northeast colonies: planks, barrel staves and hoops, grain, and salted meat. In return the colonies received sugar and molasses which stimulated the development of the distillery industry in New England. Rum became an important New England export, and was frequently carried to Africa to purchase slaves for the West Indies (Albion et al. 37; Innis 78-79).

The best grade of cod was sent to Catholic areas of Europe in exchange for a variety of European products. The middle grade of cod was either consumed locally, shipped to the southern colonies, or traded to the English colony of Jamaica (Albion et al. 27).

A pattern of fishing and trade had been established by the mid-1600s that was to continue. Although fishing was at
first close inshore, with groups of fishermen sharing the profits of their trips, gradually the New England fishermen came more and more into competition with English and French interests along the Grand Banks. Larger ships were required, of fifty tons or more, with an eight man crew. The men "fished on their own hook", meaning they were compensated proportionately for what they caught. Most did not own their boats, nor were the actual fishermen the ones who made large profits in the trade. The wealth to be made from the fish lay in their export to the West Indies or Europe, and this was primarily in the hands of Boston or Salem merchants (Albion et al. 29).

Morison has stated that fishing by itself would have bought little wealth if colonies like Massachusetts had to depend on outside areas for their ships (Maritime History 14). The timber for ships was close by, (at least originally) and New England's ship-building industry began almost immediately. Ships could be built in the American colonies at least 30 percent cheaper than in England; many larger ships were built, loaded with a cargo, and sold in Europe along with their cargo (Albion et al. 25). By 1700, "almost every settlement with access to tidewater launched one or two vessels each year." By the Revolution major ship yards were launching vessels at the rate of one a day (Albion et al. 23).
As some settlements specialized in fishing, others in ship building, others specialized in whaling. Colonists did not immediately start to hunt whales at sea, but drift whales were apparently very common and a matter of great concern. In parts of Europe whales stranded on shore were considered "royal fish" which belonged to the king (Spence 13). In the colonies, most governments developed laws very early to determine possession; in Massachusetts throughout the 1600s drift whales were divided three ways, between the colonial government, the town, and the finder. This of course meant the oil rendered from the carcass and the bone, since the animal was not consumed (Starbuck 6-7).

The first whaling was almost literally on shore, and is a good indication of how common the whales actually were. Beginning around 1645, the people of Southampton, Long Island, built a variety of high lookouts on shore, and every man was required to take a turn as lookout. When whales were spotted, small boats were launched and the dead whales towed back to land. In time, other towns gradually took up shore whaling. In 1688 Edward Randolph reported to England that "New Plimouth Colony have great profit by whale killing. I believe it will be one of our best returns now beaver and peltry fayle us" (qtd. in Spence 36).

Nantucket decided in 1690 to invite a Cape Cod expert to come and instruct them on killing whales and extracting oil. So plentiful were the whales around the island that
Nantucketers could obtain all the oil they needed without getting out of sight of land. The south side of the island was divided into four parts, each with a group of six men and a watch tower, and Nantucket entered the whale business (Starbuck 19).

The increase in shore-based whaling led to disputes about whether or not whales found on shore were wounded by boatmen or were true drift whales, and many colonies appointed inspectors to decide. True drift whales were scarce by 1681, though quarrels about beached whales were recorded in the early 1700s. After that, whales were scarce enough near shore that finding a beached animal was an uncommon occurrence (Dow 14).

Shore-based whaling was equally short lived. By 1715 Nantucket was supplementing shore whaling with larger boats that could stay at sea for as long as six weeks. By 1730 shore whaling was no longer economically viable as sightings from shore had become too rare (Stackpole 25-27). The grey whale, the most important species for shore-based whaling, may have become totally extinct in the Atlantic by 1750, "the first major extinction ... perpetrated by Western man in North America" (Mowat 231).

American whalers did not initially venture into the deep ocean. This was partly because at first there was no need to, and partly because of intense foreign competition. The black right whale was still common a short distance from
shore even after the grey whale disappeared. Arctic whaling, now concentrated on the Davis Straits area between Greenland and Baffin Island, was dominated by the Dutch, with sizable contingents from other European countries. In 1721 Europe sent some 445 whale ships to the Arctic, indicative of the effort which was to lead to the abandonment of Davis Straits by 1750, and the eventual North Atlantic extinction of the bowhead whale (Spence 45-47; Starbuck 37-39).

New Englanders never became serious competitors to Europeans in the Arctic whale industry, but after 1712 they began to specialize more and more in the capture of the deep water sperm whale. The superiority of sperm whale oil was already known, and in addition the animal's bulky head contained a tubular reservoir of pure spermaceti, a waxy substance which was the best lighting fluid yet discovered. Sperm were more aggressive than most whales when injured, and frequently attacked the boats attempting to catch them, but they became economically so valuable Nantucket had 25 ships specializing in sperm by 1725 (Spence 44; Stackpole 25). Americans killed other deep water whales however, in particular the humpback. With a relatively low fat content, humpbacks sank when killed and the whalers had to wait and hope to recover the carcarse when decomposition floated it to the surface some three days later (Mowat 248-249).
The price of oil began to rise in part because of new uses found for it, and in part because of an expansion of industries which had long been users of whale oil. American whaling and related industries boomed throughout the latter part of the 18th century. Large quantities of sperm whale oil and spermaceti candles were exported to Europe, and the cheaper right whale oil was exported to the West Indies and consumed in the domestic market. Sperm oil also proved to be an excellent lubricant for machinery, and whale oil was used in soap making and in finishing leather and wool products (Stackpole 48; Dow 35-39).

By 1774 the colonial America sent out at least 360 vessels after whales, having an aggregate burden of 33,000 tons and an average size of nearly 100 tons. Most sailed out of Massachusetts, and 150 of these came from Nantucket. The dramatic increase in the numbers and size of whaling ships in the 18th century, the larger numbers of crew required, and the increased costs of outfitting, made whaling a capital-intensive business, with profits constantly reinvested into larger ships. Owners or members of their families frequently shipped as captains, officers, cooperers, etc.; officers and crew received payment by "lays", meaning they received a certain proportion of the profit as pay (Starbuck 51).

The increase in vessels meant a decrease in whales, plus the American whalers were hampered by new British
restrictions as Britain attempted to develop their whaling industry on the remaining northeastern Atlantic whaling grounds. As a result, Americans crossed the Atlantic and were soon fishing around the Azores and the African coast of Guinea. Shortly before the Revolution they crossed the equator and discovered the Brazil Banks, and were soon whaling near the Falklands (Spence 53; Stackpole 52-53).

In addition to whales, many colonists sought oil from other marine mammals, particularly the walrus. These huge animals once inhabited the coast and coastal islands of North America as far south as Cape Cod. Although probably extinct south of Nova Scotia as early as 1700, walrus still existed by the hundreds of thousands in the area around the Gulf of St. Lawrence. In 1762 England awarded two Bostonians the exclusive privilege of hunting walrus among the islands in the Gulf, and up to 1774 their crews killed some 25,000 animals a year. Other New Englanders also hunted the walrus in the Gulf, regardless of the monopoly, and the enraged Bostonians complained about the "reckless and barbarous" killing practiced by their competitors. In a scenario to be repeated countless times, the Bostonians redoubled their efforts while there were still walrus to be hunted. The animals had largely disappeared from the Gulf of the St. Lawrence by 1800 (Mowat 301-319).

Hence even before the American Revolution, New England's exploitation of marine mammals had began to assume
a pattern distinctly American in its aggressiveness. Since these animals were a common property resource, the only way to profitably exploit them was to discover new habitats unreached by competitors, and then kill the animals as rapidly as possible before someone else could do the same. It was this aggressiveness which Edmund Burke so admired when he urged conciliation between the American colonists and England in 1775.

Burke was attempting to defeat a bill before the English Parliament which would prohibit the colonists from the North American fisheries and restrict the importation of American whale products. He noted that the colonies were feeding Britain, in large part due to "the wealth which they have drawn from the sea by their fisheries." Burke urged his listeners to "look at the manner in which the People of New England have of late carried on the whale fishery."

Whilst we follow them among the tumbling mountains of ice ... whilst we are looking for them beneath the Arctic Circle, we hear that they have pierced into the opposite region of Polar cold.... Nor is the equatorial heat more discouraging to them, than the accumulated winter of both poles. We know that whilst some of them draw the line and strike the harpoon on the coast of Africa, others run the longitude, and pursue their gigantic game along the coast of Brazil.... Falkland Island, which seemed too remote and romantic an object for the grasp of national ambition, is but a stage and resting-place in the progress of their victorious industry.... No sea but what is vexed by their fisheries. No climate that is not witness to their toils. (qtd. in Starbuck 61)
TO VEX ALL OCEANS (1778-1820)

In one respect, Burke was wrong: American whalers and traders did not "vex all oceans" prior to the American Revolution, but they certainly did after peace was declared. This was true despite the fact that the war had devastated the maritime economy and large numbers of vessels had been sunk or captured. Although a guarantee of certain fishing rights was of major concern in the peace treaty, England ultimately banned American fish and meat from the West Indies and either banned or taxed many other products for import to the British Isles, including fish, whale oil, and whale products. Traders were forced to find new markets, and political freedom from England meant they could seek such markets everywhere.

Much of this time period has been called the "Heroic Age" in American maritime history, a time when enormous fortunes were made (and often lost), when much of Europe was at war on the sea, and when markets fluctuated wildly (Albion et al. 45). Even if "heroic," maritime activities actually involved relatively few Americans, as more and more people became caught up in the westward expansion of the country. Nonetheless, those few Americans involved with the ocean frequently had incredibly adventurous lives (or quick deaths) and had intimate contact with hundreds of different cultures all over the world. Those who were fortunate invested in land and in the emerging industrialization;
those who were not tried to support themselves in their old age by writing romanticized versions of their adventures.

From the perspective of Hawai'i and many other cultures in the Pacific the activities of these maritime Americans were hardly insignificant. For the first time, Americans began to exploit the resources of the Pacific basin, and to interact with the cultures of Polynesia. Ecologically, their activities were often devastating, for their progress around Cape Horn and northward through the Pacific was frequently due to the decimation of previously exploited marine mammal populations. American interaction with indigenous cultures was often equally devastating. The discovery of Hawai'i by James Cook turned out to be one of several events which happened almost simultaneously, and which together economically opened the Pacific to Americans. Because of their ultimate significance to Hawai'i, these events will be examined in some detail.

One trade restriction imposed by England at the end of the Revolution essentially stopped any importation of Chinese or East Indian products via England. As a result, Americans sought their own market directly. So successful were they that while in 1791 New England exported about $3.8 million worth of goods to Europe, almost all domestic in origin, by 1807 European exports were worth over $24 million. At least 75 percent of this growth was due to the
reexportation of foreign produce, primarily from China and the East Indies (Albion et al. 61).

In order to trade successfully with the east Asian cultures American merchants had to find commodities that were desirable there, and the search for commodities led to the economic invasion of the Pacific. Although European countries were also involved in this search, only America was almost totally dependent upon products acquired in the Pacific to make a profitable trade in China. Hence Americans were the most aggressive in their pursuit, and their search for fur seals, sea elephants, sea otters, beche-de-mer (sea cucumber), moss coral, sandalwood, and any other marketable commodity brought them into contact with hundreds of Pacific Island cultures. Whaling, although not practiced specifically for the China trade, grew along with it, and many Pacific voyages combined whaling with sealing and other activities.

Wild ginseng, growing in the Appalachians from Quebec down to Georgia, and in a few areas in the Mississippi and Ohio River valleys, was the only American product of value in China. Used there as an aphrodisiac and general cure-all, it had already been a trade item in colonial times, with 74,000 lbs. reaching London in 1770. In early 1784, a Boston sloop which had headed around the Cape of Good Hope with a load of ginseng, returned with the news that it had exchanged its cargo for tea at the highly favorable rate of
two pounds for one—without even reaching China. The captain of a British East India Company vessel had bought the ginseng and sold the tea at the Cape of Good Hope (Goldstein 21-27).

Within a month the 360 ton Empress of China, loaded with thirty tons of ginseng, some furs, woolen cloth, and money, set out for China around the Cape of Good Hope. Her return in 1785, with a cargo of teas, silks, procelain and lacquer-ware, netted her owners a $30,000 profit or a 25% gain on their original investment. This was viewed as extraordinary, but was nothing compared to some of the later gains made in the China trade (Goldstein 30; Rydell 24).

Unfortunately, the consumption of ginseng in China was somewhat limited, and the sources of ginseng in the United States were equally limited. Another commodity valuable in China was already known however. John Ledyard, one of the Americans who sailed in James Cook's third voyage in search of a northwest passage, returned in 1783 to spread the news in America of how profitably sea otter furs obtained in the Pacific northwest had sold in Canton. At the same time he publicized the discovery of Hawai'i, and the islands' convenience as a supply station for ships in the northern Pacific. Hence news of the simultaneous discovery of Hawai'i and of a valuable commodity available along the Pacific coast reached the United States just as the need for such a commodity was becoming clear to American merchants.
Ledyard personally tried to interest merchants in a northwest coast venture from the time of his return, and immediately produced an account of his travels. Although J. C. Beaglehole (1: ccix) has dismissed Ledyard's book as "a worthless production," in part because the last forty pages are directly plagiarized from an earlier account by another member of Cook's crew, John Rickman, the book did serve to publicize the possibilities of the northwest fur trade in America at a very early date. American merchants did not immediately enter the sea otter trade, but they were to do so before the decade was over.

In 1787 a group of investors outfitted two vessels for the northwest coast. At a cost of $50,000 the Columbia Redivia, a 212 ton ship, and the Lady Washington, a 90 ton sloop sailed from Boston commanded by John Kendrick and Robert Gray respectively. The Columbia, now under Captain Gray, returned in August of 1790, the first American ship to circumnavigate the globe. In part because Kendrick had "purchased" the Lady Washington in Canton without ever bothering to compensate her owners, the voyage was not a financial success, yet the Columbia was sent out again within six weeks of her return (Howay, Voyages).

Americans were not the first nation to trade for sea otter along the Pacific northwest; by 1786 at least four British ships had done so and they continued to dominate the trade until 1794. The British ships however were caught
between trading restrictions of the the South Sea Company and the East India Company, which necessitated licensing by both in order to pursue the trade. Ultimately this was not profitable, and though 35 British traders visited the northwest between 1785-1794, compared to 15 American vessels, between 1795-1804 only 10 British ships traded, compared with 68 for the Americans. America continued its domination until the increasing scarcity of sea otter brought the trade to a close around 1825 (Rydell 27-28).

From the Hawaiian perspective, this meant that from 1795 on Americans were the most frequent visitors. It was primarily through Americans that the Hawaiian chiefs were able to gain access to the world market system.

The object of this trade, the sea otter, is the smallest of the marine mammals. Otters once ranged along the Pacific coast of North America from as far south as halfway down Baja California all the way north to the Aleutian Islands. They were also found in Kamchatka and the Kuril Islands of Asia, south through Sakhalin to Hokkaido, always along rocky shores in some ten to twenty-five fathoms of water. Never a numerous species (original population estimates are from 100,000 to 150,000 animals), they were first exploited for long distance markets in Siberia, shortly after Vitus Bering's 1741 voyage. Their value in the Russian market stimulated the interest of that country
in the Pacific northwest, but it was not until Cook that the possibilities of the China market were realized (Kenyon 134-137).

In Canton sea otter often brought more than $60 per pelt, and during the early period of exploitation the price never fell below $20. The Americans did not hunt the otter themselves, but rather relied on trade with northwest coast Indian tribes. For a cargo of trade goods worth around $10,000, a ship received on the average about $100,000 for its furs in Canton (Rydell 28). Considering that the tea and other goods purchased in China could be sold in America or reshipped to Europe at high profits, 200-400% gains were not unknown. Even the ships' officers could share in this, for though on salary, they were permitted cargo space for their own private investments. A captain could clear $2500 a year and "pyramid" the profits by taking shares in future voyages (Morison, Maritime History 70-77).

It is questionable if such high profits would have been possible without the ease of provisioning and wintering in the Hawaiian Islands. For the Americans as well as the British, most trips to the northwest were around Cape Horn, with provisioning stops possibly at the Galapagos or Marquesas, but invariably at Hawai'i before going on to the coast. Due to the number of ships seeking furs, within a very few years it was necessary for a ship to spend two or more years on the coast, frequently wintering or at least
provisioning in Hawai'i. In the opinion of historian F. W. Howay, the success of the fur trade in a large measure was "dependent upon the support received from the Hawaiian Islands," and almost every ship involved stopped at least once in Hawai'i, obtaining not only supplies but new crew members ("Last Days" 79).

By the end of the 1790s American ships were also cruising along the coast of California after otter skins. The trade was prohibited by Spain, and an additional difficulty was posed by the fact that California Indians did not traditionally hunt for sea otter, and the Americans lacked the considerable skill necessary to kill the animals themselves. By the early 1800s a contract system with the Russians had evolved to exploit the California otter. Americans supplied the ships, Russian settlements to the north supplied Aleutian hunters with canoes to do the hunting, and the profit was split. Although there were never large numbers of ships involved, the contract system continued to be a profitable source of otter until after 1815, when the Russian American Fur Company moved south to begin their own operations directly. As early as 1817 otter were seriously depleted north of San Francisco, although still numerous in the south (Ogden 45-55).

Although the discovery of the commercial value of sea otter was the event that most directly involved Hawai'i in this phase of American maritime history, other commodities
were sought and found and destroyed throughout the Pacific to further the China trade. Fur seals were hunted even before the sea otters. Cook's second voyage, from which he returned in 1775, had brought him around Cape Horn and he had recorded the presence of fur seals in the rocky island areas nearby. In 1783 there was an American sealing expedition to the Falklands, and another in 1784 took 13,000 animals. The pelts were put on board the Eleanora, Simon Metcalf commanding, and sold for a large profit in Canton (Stackpole 152-53).

These cold-water animals were found primarily south of 30 degrees latitude in all the island and continent areas circling Antarctica. Inhabiting rocky shores of South America, Africa, Australian and hundreds of nearby islands, several different species were hunted (Scheffer 3-5). Seal skins brought only one to two dollars on the average in Canton, but seals were much more numerous than otters (hundreds of thousands, even millions in some areas) and they were very easy to catch. No particular skill was needed, so the ships' crews clubbed and skinned the animals themselves. About twenty men could kill and skin some 50 seals a day, so that the enormous volume of animals traded made the business profitable (Rydell 34). As a bonus, the huge elephant seal was often found on the same islands as the fur seals. Elephant seals not only had valuable pelts but their bodies could be processed for oil.
The average seal voyage lasted some three years, usually with part of the crew being left on an island to slaughter seals while the ship delivered a load of skins to Canton. Voyages such as this yielded enormous profits of from 100 to 600 percent on an original investment of approximately $15,000. One merchant involved planned to withdraw from the trade when profits fell as low as 100 percent (Rydell 40-41).

Initially, the destruction was centered on the islands on both sides of Cape Horn, and there were sufficient seals so that the ships did not need to venture into Polynesia. In 1797 Edmund Fanning found the rich sealing grounds of the Juan Fernandez Islands, 1000 miles west of Chile. After taking thousands of seals, he exchanged them in Canton for a cargo which brought him $120,000 in New York, leaving Fanning with a personal profit of $53,000 for the one voyage (Albion et al. 112). That same year the New Haven ship Neptune made a spectacularly successful sealing voyage. After picking up some 30,000 skins in the Falklands, the Neptune spent eight weeks at the Juan Fernandez Islands, killing over 80,000 seals. After selling the skins in Canton the ship return to New Haven with the usual China cargo. The ships owner, Ebenezer Townsend Sr. cleared a profit of $100,000; his son, who had been on the ship as
supercargo, made $50,000, the Captain $70,000, and each of
the crew (working for shares) made $1200 (Townsend, preface;
Stackpole 211).

Attracted by the possibility of similar profits, ten to
twenty American sealers operated in the Juan Fernandez
Islands each year for the next ten years, taking perhaps as
many as three million animals (Rydell 35). Not surprisingly
when the American sealer Isaac Iselin visited Juan Fernandez
in 1806 he discovered "the race of seals is nearly
extinguished" (Iselin 22).

Rookeries on the east of the Horn suffered the same
fate. Sealer Amasa Delano, off the Falklands in 1800
looking for seal, found "they have been principally
destroyed, and the few that remain, are so shy that it is
very difficult to get near enough to kill them" (261). Over
a million pelts had been taken from the South Georgia
Islands by the 1820s and they were almost barren; the South
Shetland Islands, three hundred miles south of Cape Horn,
were discovered in 1819 and barren of seals two years later
(Rydell 35).

As a result of the indiscriminate slaughter, sealers
were constantly searching for undiscovered islands with
populous rookeries, and for other cargoes with which to fill
their holds if they didn't find seals. This brought them
into Polynesia and off the coast of Australia, and often
into direct competition with British interests. After 1804
the Australian governor banned Americans from sealing in the area, not only to preserve the animals for English sealers to kill, but because Americans frequently illegally signed on convicts. Sir Joseph Banks warned the British government in 1806 that "we must encourage our people to take them [seals] wherever they can find them or the Americans will have them all." He also complained that "The mischief the Americans have done by stealing convicts from Sydney & when they found them useless or mischievous ... landing them on the South Sea Islands is almost incalculable" (qtd. in Strauss 16).

As it grew more and more difficult to find seals, the voyages became longer and were often unsuccessful. In seeking cargoes, sealers frequently traded with settlements along Spanish America and provisioned at Hawai'i (as did Iselin's ship in 1807). Eventually the sealers discovered the only fur seal rookeries north of the equator on the Farallon Islands and smaller islands off Baja California. American sealers left at the Farallones between 1810 and 1812 took over 73,000 animals; when the Russians set up a permanent post at these Islands after 1812, they could take only 1200-1500 per year. The species became extinct in the Farallones shortly after 1820 (Scheffer 81).

Ultimately many voyages to the Pacific were purely opportunistic, with ships sent out with instructions to collect whatever they could find. Beche-de-mer (or dried
sea cucumber) sold for excellent prices in China (where it was used in a gourmet soup) but its collection depended on cooperative Pacific Islanders, and was very slow. In addition, it had to be carefully dried in specially constructed smoke houses, usually with men left on shore on a variety of islands to supervise. Americans were almost exclusively involved in this trade (Strauss 27).

Other products sought in the islands included pearl and tortoise shell, coral, sea moss and various "curiosities" of native manufacture, but the most profitable was sandalwood. Desired in China primarily for incense, sandalwood was found on several Pacific Islands, though usually not in large quantities. Fiji had some of the highest quality of sandalwood, and the Fijian experience was typical of the sandalwood trade. The ship Fair American picked up a small cargo there in 1804. In 1808 the Jenny, a Boston sealer, collected 250 tons of sandalwood at a cost in trade goods of about $250; the wood sold in Canton for $100,000. In 1811 at least five American ships were in the main harbor at the same time, and by 1813 the islands had been stripped of wood (Strauss 11).

By 1804 sandalwood had been discovered in Hawai'i, and the same process began there particularly after the close of the War of 1812. While Fijian sandalwood had frequently sold for $20 a picul (133 and 1/3 lbs.), Hawaiian wood brought at most $10 a picul and frequently less (Strauss
By this time however the huge profits of former years were difficult to come by in the Pacific, and more ships than ever became involved in the Hawaiian sandalwood trade. In the 1817-1818 period, sandalwood traders, primarily American, were arriving in Hawai'i at the rate of almost four a month (Morgan 62). However, the height of the trade with Hawai'i did not occur until after 1820.

While many Americans roam the Pacific immediately after the Revolution in search of commodities to sell in Canton, whalers were able for a time to remain in the Atlantic. Atlantic whale populations had recovered slightly due to their reprieve during the war, and a few more years of profitable Atlantic whaling were possible when the war ended. American whalers had been near Cape Horn immediately prior to the Revolution, but British restrictions on whale imports barred the most important market and limited profits.

In 1788 America had only 80 whaling ships, while England had 314, but most of the English ships in the south Atlantic were manned by Nantucket whalers who had moved to England or the French duty free port of Dunkirk after the Revolution (Stackpole 135). The first whaler into the Pacific was the British ship Emily, whose captain and mate were from Nantucket. News that sperm whales were in the Pacific quickly spread to American whaling ports.
Several of the first ships into the Pacific were American but sailed out of Dunkirk. One of the first from an American port was the 240 ton Nantucket ship, the Beaver. Sailing with a seventeen man crew, her voyage lasted seventeen months, and netted her owners a profit of $20,000 in 1793; good, but not spectacular (Stackpole 152-153). Many whalers continued to hunt off Africa, the Brazil Banks and the Falklands. As whales dwindled in the south Atlantic, many ships combined sealing with whaling as they moved around the Horn (Stackpole 164).

In the early days of Pacific whaling, the British were common competitors and had an important economic advantage. British whalers usually entered the Pacific via the Cape of Good Hope as convict ships bound for Australia; once their cargo was unloaded they became whalers. To increase profits American whalers frequently loaded a mixed cargo and attempted some trade with Spanish American settlements in Chile and Peru, but this was a dangerous activity and had no guarantee of a return (Spence 65).

The English whaling fleet was devastated by the Napoleonic wars and the War of 1812. American whaling also suffered a setback in the war, but by 1815 America had gained an ascendancy it was never to relinquish. Large numbers of ships and men entered the whaling industry, with total American whaling tonnage leaping from 1,230 tons in 1815 to 16,750 tons in 1818 (Morgan 75). Most of these
ships were forced into the Pacific due to the almost total depletion of Atlantic grounds.

Whalers began to search for new grounds all over the Pacific, and the rich "off shore" grounds 1000 miles west of Peru were discovered in 1818. The next year, two New Bedford ships put into Kealakekua Bay, but the onslaught of whalers did not occur until the discovery of the "Japan" grounds 40 days sailing to the west of Hawai'i. Captain Winship, one of the fur and sandalwood traders who frequented Honolulu, passed through these grounds on a voyage back from Canton and told his Nantucket friends about the sperm there. In 1819 the whaler Maro was dispatched, and after a visit to Hawai'i, returned in 1822 with 2400 barrels of sperm oil. In 1821 six or seven ships were whaling in the Japan grounds; by the next year there were more than thirty (Morgan 76; Starbuck 96). Pacific whaling was about to enter its own golden age. As the northwest fur traders had discovered thirty years earlier, for the whaleships Hawai'i was central to profitable voyages.

PACIFIC DECIMATION (1820-1850)

In the period from 1820 to 1850 whaling was the dominant Pacific activity of the United States. Trade with China and the East Indies continued to be important, but Pacific resources on the whole were so decimated that fewer traders went island hopping to gather cargoes. Instead,
many sailed around the Cape of Good Hope with varied cargoes designed for the China market.

There were other resources in addition to whales which were not yet exhausted in the Pacific, and some ships and traders specialized briefly in all kinds of products, including Hawaiian sandalwood, fur seals from the north Pacific, and sea otters, cattle hides and tallow from California. Lucky men still made huge profits, but only whaling persisted into the latter half of the 19th century as a dependable money-maker.

Pacific whaling was dominated by the Americans. Demand for whale oil and for spermaceti candles continued to grow, and America responded by sending more and more ships to the Pacific whale grounds. By 1846 the United States whale fleet totaled 735 vessels; all other nations combined had a total of only 230 whalers that year. Almost all the American whaleships hunted in the Pacific (Starbuck 98).

The populations of the sperm whale and a few other frequently hunted species were decimated. The history of Pacific whaling was summarized by Starbuck as follows:

The grouping of whalemen upon the various grounds as they were discovered soon caused the slaughter or dispersion of the whales, and as a necessary consequence new fields must be opened up to supply the demand that had become rapacious ... every year witnessed the creation of new ports from whence this crusade against the whale was relentlessly pursued. (96)
The more important new grounds to be discovered were in the northern Pacific, and yearly brought more whalers to Hawai'i.

In 1835, the first right whale was caught on the Kodiak grounds off the northwest coast. Pursuing the whales ever northward, the whalers entered the arctic again, catching bowheads east of Kamchatka by 1843. In 1845 an American whaler passed through the Bering Straits (Starbuck 100). As there were few other profitable whale fisheries left, most of the whalers went to the North Pacific, and usually visited Hawai'i (either Honolulu or Lahaina or both) twice a year.

Although the number of whaleships visiting Hawai'i varied considerably from year to year, between 1824 to 1842 the average ranged from 104 to 172 ships. After the discovery of some of the far north Pacific grounds in 1843, the numbers rapidly increased. From 1843 to 1850 an average 405 whalers visited Hawai'i each year (Kuykendall, Hawaiian Kingdom 307). Ships were provisioned and repaired at the islands. Sick, injured or troublesome crew were discharged, and new members recruited, often from the indigenous Hawaiian population. Without Hawai'i the whaling enterprise would have been much less profitable, and possibly economically unfeasible for the United States.

Although whaling dominated American activities in the northern Pacific, some traders still found profit in other
areas. Directly or indirectly most of these activities centered on Hawai'i. As the northwest coast sea otter trade died out completely after 1820, activities shifted southward to the California coast. Sea otters were still plentiful on the islands off California, and cattle hides and tallow had become a profitable cargo for the Yankee traders (Morison, *Maritime History* 266).

Mexico became independent in 1821 and removed the prohibitions of the Spanish mercantile system. All foreign vessels were welcome to trade in California, for otter skins or anything else. Although hide traders coming directly from the east coast tended to flood the California market with manufactured articles, American traders based in Hawai'i became more and more active, providing articles direct from China combined with goods transshipped from the east coast and Europe. The Hawai'i ships took on otter skins, specie, and hides for transshipment to the east coast, and horses for the domestic Hawaiian market (Ogden 86-91).

Honolulu-based Americans became some of the most active in the pursuit of sea otter. Only Mexican citizens could obtain a license to legally hunt for otter, and the illegal American ships were termed *contrabandistas* (Ogden 120). Richard Henry Dana came across one of these traders from Hawai'i in 1835, and thought the ship so heavily armed it looked like a man-of-war:
Her armament was from her being an illegal trader. The otter ... being of great value, the government requires a heavy sum for a license to hunt them, and lay a high duty upon every one shot or carried out of the country. This vessel had no license, and paid no duty, besides being engaged in smuggling goods on board other vessels trading on the coast, and belonging to the same owners in Oahu. Our captain told him to look out for the Mexicans, but he said they had not an armed vessel of his size in the whole Pacific ... These vessels frequently remain on the coast for years, without making port, except at the [California] islands for wood and water, and an occasional visit to Oahu for a new outfit. (235)

Other Americans became Mexican citizens in order to legally purchase licenses to hunt the otter, and they complained loudly about the illegal Honolulu ships. One, a former Bostonian named Cooper, particularly objected to the "piratical manner" in which hunting was done by those "sent out from the Sandwich Isles", who took all the otters they could find and frequently killed cattle and horses belonging to the missions. In a letter to Honolulu merchant Hunnewell in 1833, Cooper vowed to hunt "till there is not an otter left on California." In Cooper's opinion, this would not take long: "Where there was taken 700 a few years ago I took but 32 from San Francisco to Monterey, and actually as things appear [I] do not think we shall get 600 skins in all on the coast" (qtd. in Ogden 124).

The Mexican government was incensed at reports that the *contrabandista* ships from O'ahu destroyed pups as well as adults, not only of the otter but of the few remaining fur seals. Nonetheless, the government was unsuccessful at
stopping the slaughter. After 1840, otters were found only on the more distant islands, and in Mexico only the naturalized American merchants had the necessary capital to hunt them. By this time, the hunting was primarily for the American market as otter skins were out of fashion in China, and soon the declining numbers of otters brought an end to the trade by which Hawaiians and numerous northwest coast tribes had their first encounter with capitalism (Ogden 132-143).

Cheap South American cattle hides had stimulated the development of the New England shoe manufacturers in the early 19th century. Although most hides continued to come from South America, the low price of California hides in the 1830s made it profitable for some ships to make the long two year trip around the Horn (Morison, Maritime History 269). Richard Henry Dana, who worked in a hide ship during the height of the trade (1834-1836), is the best-known chronicler of the immense hardships involved. Ships cruised for over a year up and down the California coast, collecting, curing and loading the hides. Hawaiians were frequently employed for the hard labor of tanning, and also to help man the boats in and out of the treacherous surf, for Dana noted that Hawaiians were "complete water-dogs" (90). Supplies for the hide ships usually also came from Hawai'i.
Hawaiian sandalwood continued to be important into the late 1820s, and at least small amounts were taken from the islands throughout the 1830s. The early 1820s were the "bonanza" years however, with 30,000 piculs worth about $300,000 being exported every year. The Hawaiian chiefs controlled the trade, and traders competed with each other to ship in attractive goods which could be exchanged for sandalwood. The traders were only too willing to trade for the mere promise of sandalwood even when it was obviously becoming scarce; the resulting debts brought American warships in 1826 and 1829. Attempts by the chiefs to pay the debts led to almost total decimation of the sandalwood trees. By the late 1830s only a few thousand piculs were exported each year, and by 1840 sandalwood was, at least commercially, extinct in Hawai'i (Morgan 64-67).

CONCLUSION

By 1850 hundreds of individual fortunes had been made from otters, fur seals, sandalwood, whales, and other Pacific commodities. Enormous wealth was transferred to the American northeast, where it helped finance the industrialization of the United States. While some made huge profits, the majority of men who were involved in the extraction of this wealth from the Pacific did not become wealthy.

Whaling was one of the more reliable enterprises during this time period, but Charles Wilkes noted in 1840
that it was possible for a ship to cruise all 15 Pacific whaling grounds in a year and never catch a single whale. He estimated that around ten per cent of all whaling ships had losing voyages from accident, incompetent captains, or sheer bad luck (5: 497). Accidents and bad luck included shipwreck (the most common), mutiny (as the Globe in 1824) and even being rammed and sunk by a whale (as the Essex in 1819). Stories of ships lost through a variety of causes abound in all aspects of the Pacific commerce, and many ships simply vanished after they left port, probably driven onto Pacific atolls and islands during storms.

The profits to be made were obviously well worth the risk if one had the capital to buy in as part owner of a ship, or the skill and luck to work up to ship's master. However, for the average seaman on board a whaler, sealer, or trader, life was adventurous but rarely profitable. Northwest and China traders normally paid wages; in 1815 a Bryant and Sturgis ship from Boston (carrying a cargo of 70,000 Spanish dollars) paid ordinary seamen less than ten dollars a month and the more experienced able seamen seventeen dollars. Food of course was provided, but although usually adequate in quantity certainly lacked much in variety. The menu on the Bryant and Sturgis ship Orphelia was fairly typical: daily rations consisted of one lb. salt pork or one and a half lbs. salt beef, one lb. bread, three pints tea or coffee, and three quarts plus one
pint of water. Once a week rice and molasses were served, and twice a week a little rum (Hill 379).

Living conditions on board even the best ship were hardly comfortable, and usually only cramped and dirty quarters were provided for the crew. One ship that Delano served on was sunk at one point (and raised again) "for the purpose of destroying the vermin and insects, with which she was overrun. They consisted of centipedes, scorpions, innumerable black ants, some rats, millions of cockroaches, and some small snakes" (Delano 155). It is obvious that such ships were prime agents in spreading many animals throughout the Pacific, frequently altering fragile island ecosystems in the process.

Whalers and sealers had the same type of food and living conditions, but usually the crew shipped for a share or "lay" as it was called, of the profits. Particularly after 1815, the "lay" system tended to be an extreme form of exploitation. It also guaranteed that even young seals and whales would be slaughtered, since the crew felt that any animals spared decreased their own "lay". At a time when the average voyage netted the owners sixty cents on a dollar of capital, the actual money netted by ordinary seamen was frequently zero (Albion et al. 137; Morison, Maritime History 319-322). The dividend of a voyage was usually computed on an oil price fixed by the owner below the actual market price. The lay of an ordinary seaman might range
from 1/160 to as small as 1/260. If a voyage's net proceeds were $45,682, as was the case for one ship, a 1/260 share was $175.70 for a three year voyage (Hohman 217).

In addition, each man was charged a variety of fees, including one for the medicine chest, since unlike the British the American whalers carried no ship's surgeon. Each man usually was also charged a "fitting out" fee, and sometimes for ship's insurance, even though if the ship was lost the owners collected all the money. Any additional clothing needed by the sailor during the voyage had to be purchased from the ship's "slop chest", usually for inflated prices which were charged against his "lay". Often sailors needing spending money while in ports like Honolulu bought from the slop chest in order to sell the clothing for a little ready cash. When the voyage was completed and all the fees and slop chest charges cleared, sailors often found that their entire "lay" had been spent (Morison, Maritime History 320-321).

With the growth of whaling and the difficult working conditions and poor pay, fewer and fewer experienced seamen went on the whalers. Instead, the ships were filled with inexperienced Americans from the rural areas, new immigrants, and Pacific Islanders of all kinds. Having little expectations at the end of the voyage, about a third of a whalership's men deserted annually. Hawai'i and California in particular acquired numerous American
nationals who deserted from the whalers and added to the American influence in those areas. That fact was to acquire increasing political and economic significance to the United States as 1850 approached.

America was not the only country which expanded its interests into the Pacific basin, but both geographic and historical circumstances drove America to more aggressive exploitation than was true of any other country. As a result the Pacific was transformed both culturally and ecologically during the first half of the 19th century. By 1850 many areas had become a wasteland as far as sea otter, fur seal, sandalwood, whales or any other potentially profitable, naturally occurring commodities were concerned. Whaling continued to be profitable only because new grounds continued to be discovered and because faster ships and new techniques made it possible to exploit previously untouched species.

Ecologically the destruction was deliberate and conscious. The sealers, whalers, and sandalwood traders knew very well they were depleting finite resources, but given the mode of production of which they were a part, the typical response was "if we don't take it, someone else will." Without question they were absolutely right. Not just increased population spurred intensification of production, to use terms from Marvin Harris (see chapter 1). The increased need of that population for goods, whether
more spermaceti candles or tea or China plates, and the
profits to be made from this need, meant that annually more
ships and more men would be sent in pursuit of otters or
whales or sandalwood, until these resources were gone. The
Americans in the Pacific from 1787 to 1850 behaved in ways
which seemed to indicate, as John Bennett has claimed for
societies in disequilibrium, that they considered "Nature to
exist primarily for satisfaction of human wants" (138).

Culturally the Pacific was also transformed,
particularly the societies of Oceania and the Pacific
northwest. All these cultures would be classified having a
kinship mode of production (Wolf), as being tribes or
chiefdoms (Service), and as exhibiting the basic
characteristics of a society in ecological equilibrium (John
Bennett). The cultural transformation was not always
deliberate, in part because most of the Americans were
neither knowledgeable nor particularly interested in how
changes in one aspect of a culture might negatively affect
another area of that culture.

American policy in terms of cultural interaction was
often one of expediency, and much of what actually happened
depended on what the Americans wanted from the culture, what
type of culture it was, and whether or not any western
nation had already laid claim to the land. The rest of this
research will focus on what happened in Hawai'i, and how
Americans intentionally changed the culture in ways which
unintentionally but negatively effected the Hawaiian maritime mode of production. How Americans reached Hawai'i and the reasons for their presence has already been presented; chapter three will focus on the type of culture they found, and in particular on its maritime mode of production.
CHAPTER THREE

HAWI'I AND THE SEA

INTRODUCTION: PROBLEMS WITH CULTURAL RECONSTRUCTION

"Few areas of equal size in this world have been the subject of so many books as have the Hawaiian Islands." The historian Harold Bradley wrote those words in 1968 in the preface to "yet another" book on Hawai'i, The American Frontier in Hawaii (vii). In the almost 20 years since many more books have been written with Hawai'i as a subject. Despite this relative wealth of published material, fundamental problems remain in reconstructing the effect of any outside culture upon Hawai'i. In attempting to understand how and why any aspect of Hawaiian culture changed in the early post contact period, it is essential to have a model of Hawaiian culture as it was in 1778. Yet much of the evidence for any model must come from sources which postdate 1778. The sources themselves frequently had their own model of precontact Hawaiian culture, and it becomes very difficult to separate the practice of using evidence to build up a model from that of choosing a model and finding evidence to support it. Hopefully the former has been practiced here, but to more clearly illustrate the problem, the different models will be discussed prior to the evidence.

First is what will be termed an equilibrium model, an approach with a long history and a respectable tradition in
anthropology. To some extent this approach has experienced a modern revival within ecological anthropology. For Harris as well as John Bennett (see chapter one) many non-state cultures of both past and present are viewed as being in an equilibrium with their environment, though often at the cost of severe restrictions on population growth. In part because of this, non-state cultures are themselves in equilibrium, changing relatively little through time.

The notion of cultural equilibrium is compatible with non-ecological approaches that view the state as repressive and in almost all cases imposed from outside; hence primitive or non-state societies are often viewed as stable and usually resistent to socioeconomic change until conquered by an expanding civilization. Their history and past is then written by their conquerors in keeping with the political aims of those conquerors (e.g. Stanley Diamond Chapt. 1). This particular version of the cultural equilibrium model is a lineal descendant of the "noble savage" approach which imbrues Cook's writings.

There are two almost contradictory approaches to utilizing sources which both come from the assumption that Hawaiian culture was in environmental and cultural equilibrium in 1778, and that subsequent change was entirely due to western contact. In the one approach, the stability of the culture is emphasized, with the implication that even in the post-contact period cultural change was very slow.
Ross Cordy did this in his study of prehistoric Hawai'i. Cordy found little evidence for any major change in the post-contact period, and freely used all ethnohistorical sources up to and past 1820 to reconstruct Hawaiian culture in 1778.

In a second approach based upon the concept of cultural equilibrium, the importance of western contact in inducing change in a stable culture is emphasized. This is the position of anthropologist Marion Kelly in an important article written in 1967. Accurately noting that it is "difficult to identify indigenous and acculturated behavior in ... [the] ... sources", Kelly states that major changes in Hawaiian political, social and economic structure occurred very soon after western contact, and that Kamehameha I structured his government "according to descriptions provided him by agents of Western culture" among whom the "most resourceful and most important" was George Vancouver ("Some Problems" 402). The assumption here is clearly that Hawaiian culture changed only due to western contact and that it changed in a manner basically directed by westerners. With this assumption, it would be difficult to use any written source as evidence of precontact Hawaiian culture.

A second model would classify Hawai'i as a culture in disequilibrium, a culture which was unstable and in the process of changing. The instability could be due to
environmental factors, the fundamentally ecological problems caused as population pushes against resources. Sahlins favored this interpretation of precontact Hawai'i, and the inherent instability became part of the explanation for rapid cultural change with western contact (*Stone Age Economics* 141-148). Irving Goldman also found precontact Hawai'i to be dynamic and unstable, but the factors in his analysis have nothing to do with environmental pressures. To Goldman, the internal pressures of a growing aristocracy were driving Hawaiian society to a major sociopolitical change. Westerners arrived in time to be "midwives" to major change, but it would have happened without them (200). Eric Wolf, while not concerned with the Hawai'i situation, viewed all chiefdoms as intrinsically unstable and dynamic. For this reason higher status individuals within chiefdoms often actively cooperated with foreigners and themselves became agents for cultural change.

With regard to the use of ethnohistorical sources, however, the model of cultural instability creates the same problem as if western contact quickly caused major change in a previously stable society. All post-contact sources are suspect.

A third model exists, which presents precontact Hawai'i as a society which had already made the major transition from chiefdom to state. Anthropologist Robert Hommon is one proponent of this view, and has stated that four states
existed in Hawai'i in 1778 (Formation of Primitive States). Similar to his approach is that of S. Lee Seaton, who terms Hawai'i a "pristine" state during the time period from 1738 to 1778, with a "true" state emerging soon after western contact ("Early State"). Prior to contact Seaton believes that Hawai'i was in ecological equilibrium due primarily to elaborate and ritualized redistribution cycles, but was not a "true" state since "no polity could affect or guarantee that it maintained a reasonable monopoly of legitimate force over any stable territory" (271). Regardless, with this interpretation sources which describe Hawai'i under Kamehameha can be interpreted as describing sociopolitical institutions which existed much earlier.

All of these models are derived primarily from the same ethnohistorical sources, although Cordy and Hommon also used material from archaeology. It is the same ethnohistorical sources which will be used to reconstruct the precontact maritime mode of production and to document its change after contact.

In analyzing the reliability of this type of source material, Barbara Price has divided them into three classes which in general are a rating of their reliability or validity. Class I includes the direct records of lawsuits, court proceedings, land and tax registrations, etc.; the "account books" which "involved little contemporary interpretation or deliberate manipulation" (159). While
these are clearly the best sources, there are very few available for Hawai'i until almost two generations after contact, and by that time there is evidence of significant change in Hawaiian culture, at least in the maritime mode of production.

Class II sources in Price's classification abound. These are descriptions of a culture by foreign explorers, traders, commercial exploiters, visitors, residents, and missionaries. These accounts "commingle, in unknown proportions, eyewitness observations with informant statements ... on both the sides of informant and of recorder there are deliberate axes to grind" (159). For Hawai'i Kelly has almost dismissed this class of evidence as "casual observers repeating hearsay gathered in a visit of a few days" ("Some Problems" 399). Yet most historians and anthropologists have been forced to use these sources, and they are used in this research. It is usually possible to separate eyewitness observations from information told to the observer. Many accounts were written after visits of months or even years, and it seems inappropriate to lump all such accounts together as unreliable.

Even if the observers were present for long periods of time, knew the language, and were clear as to what they actually witnessed, the problem of bias is not an easy one. James Cook, for instance, was a remarkably complete recorder of cultural behavior, and was usually clear as to what he
actually observed as an eyewitness, what was told to him by others, and what was sheer conjecture on his part. On the other hand, as Strauss has observed, in Cook's journals of his three Pacific voyages the Polynesians emerge as the stereotyped "noble savage," as happy "children of nature in an almost idyllic setting" (151). Probably most later visitors and foreign residents to Hawai'i had read Cook. In America the story of Cook's third voyage was published serially in newspapers shortly after its European publication in 1784; later the account of all three voyages was published in the United States in 1797 and had gone through eight separate editions and various reprintings by 1800 (Strauss 151).

Subscribing to a noble savage view of Hawaiians (or to its opposite, a degenerate savage view), became almost a necessary political act for visitors after 1820. Controversy over missionary activities in Hawai'i was national if not international, and almost every visitor after that time felt obligated to comment. Supporters of the missionaries presented indigenous Hawaiian culture as one of depravity; those who deplored the changes missionaries were helping to create found the degeneracy in American culture. The axes being ground were all too obvious; but that does not necessarily mean all parts of their descriptions are invalid.
Fortunately, fishing and the entire maritime economy does not appear to have been an issue that aroused strong philosophical or political opinions. Many westerners who visited Hawai'i between 1778 and 1800 seemed almost oblivious of the fishing activities that must have been going on around them, and the same can be said of most later visitors and foreign inhabitants. They did mention fishing and fishing techniques on occasion, usually of situations that they themselves actually observed and considered unusual, and these observations can generally be considered valid.

A third class of ethnohistorical material consists of a people's own record of their history, written by themselves or by their "conquerors." To Price this class is viewed as the least reliable, since the writers usually intended "among other purposes to make Our Side look good to a posterity very much in view" (159). John Ii, David Malo, Samuel Kamakau, A. D. Kahaulelio, and Kepelino are major examples of Hawaiians educated in an alien system who wrote extensively on Hawaiian culture and history; they were frequently very ambivalent about which "side" was "Our Side", but once again that does not necessarily invalidate their descriptive accounts, particularly of activities such as fishing which were not viewed as controversial.

Other important sources in this class include oral information collected from older residents either by
missionary-educated Hawaiians (usually with missionary editing) or by foreigners directly. Included in this category are Pogue's and Kahananui's translations of Dibble, both based upon information collected in the early half of the 19th century. In the later half of the 19th century, Beckley attempted to describe and record Hawaiian fishing techniques, and Abraham Fornander recorded much of the remaining oral traditions, including information on fishing.

The major problem with this class of material in Hawai'i is that it is often incomplete, since the specific motives of the authors usually led them to emphasize certain topics at the expense of others. Several did write extensively on fishing, although only one, Kahaulelio, was actually a fisherman. Even for Kahaulelio (who did not start fishing until the decade prior to 1850) a major problem may well have been ignorance: certain aspects of the maritime production system may have changed to such an extent that few were alive to remember how it had been. Nonetheless these are viewed as important sources, both in reconstructing the precontact maritime mode of production and in examining its subsequent change.

Price recommends validating class II and III materials, where possible, not only against other accounts but also against totally externally derived data. One example of externally derived data for this research is the environment and the particular ecological constraints that were
operative. Available information on the marine ecosystem will be used to help validate class III information on the maritime economy at contact. Another example of data which is external archaeology, even though the interpretation of archaeological information is frequently dependent on ethnohistorical sources. Nonetheless the results of archaeological research will be used where possible to validate and supplement other sources of information. An additional external source of information in some instances will be ethnological information on the maritime mode of production from other areas of Oceania.

In terms of the maritime aspects of the Hawaiian mode of production, problems of reconstruction are different for each of the three components: ecological conditions, intellectual and material means, and the social relations of production. Ecological conditions will be considered first, followed by a brief discussion of the archaeological evidence on Hawaiian prehistory and the support it provides for considering Hawai'i as a dynamic, changing culture in 1778. The final two sections of this chapter will consider the maritime mode of production in 1778 with regard first to intellectual and material means, and second in terms of the social relations of production.

HAWAIIAN MARITIME ECOLOGY

A third of the earth's surface consists of one phenomenon: the Pacific Basin. Almost all of this basin is
water, containing a greater area than "all the land above sea level on the face of the globe" (Thomas 8). Contained within it are thousands of islands; yet as geologist William Thomas has noted "the most characteristic feature of the Pacific is its emptiness of land" (9). In this vast emptiness, approximately 2,500 statute miles from any other major Polynesian group or from the nearest continental land mass, lies the Hawaiian archipelago.

According to archaeologist Patrick Kirch, by AD 300-500 the Hawaiian islands had been deliberately colonized by people from Polynesian islands to the west (Kirch, _Evolution_ 79). These earliest settlers may never have realized the immensity of the primarily watery world they had discovered. The Hawaiian archipelago is composed of 132 named islands, reefs, and shoals which stretch some 1,532 miles across the Tropic of Cancer. Although the Polynesians discovered and briefly colonized the two leeward isles of Necker and Nihoa, there is no evidence they knew of the remainder of what are now termed the Northwestern Hawaiian Islands. Instead the early immigrants spread gradually over the eight main islands of the Hawaiian chain which make up over 99 percent of the total land area: Hawai'i, Maui, u, Kaua'i, Moloka'i, Lāna'i, Ni'ihau, and Kaho'olawe (Dept. of Geography 9; Tuggle 171). (See Figure 3.)

Necessarily the colonizers brought with them a highly specialized and successful maritime technology, capable of
Source: Kirch, Feathered Gods (24)

Figure 3. Hawaiian Islands
transporting them great distances through the "doldrums" and from southern to northern hemispheric weather patterns. Although the colonizers also brought domesticated plants and animals and an associated horticultural technology, it was the maritime component which initially enabled them to exploit the natural resources of their new environment. In the case of Hawai'i, most of the natural resources were to be found in the sea.

Although the land was probably covered with dense forest down to the seashore, none of the basic plant foods of the Polynesians were found in Hawai'i. Of edible native plants only a few species of ferns and the Pandanus were present. Of the animals, only one species of mammal, a bat, was found; there were no reptiles, amphibians, or true freshwater fish. Insects and tiny land snails, many unique species found nowhere else in the world, abounded but were of little use to humans as food. For food resources, the land offered only birds, particularly sea birds, which probably nested all over the islands in quantities today found only on the Northwestern Hawaiian Islands. Without the sea to sustain them over the first few years, until the plants they brought with them were established, the earliest settlers might well have starved (Zimmerman 57; Carlquist 85).

The impoverished land biota in Hawai'i was due to its remoteness from any continent or sizable island areas rather
than any climatic factor. Situated at roughly 20 degrees north latitude, the basic environment is tropical, but the enormously varied topography of the islands helps create almost every possible environmental condition and habitat. The relative age of each island, rainfall differences between leeward and windward sides, and different weathering rates have resulted in the unequal distribution of these habitats within the islands.

All the land biota discovered by the Hawaiians had originated from earlier independent plant and animal immigrants to the islands. Island ecosystems are characterized by isolation, and as a result usually evolve distinctive flora and fauna. In Hawai'i, 95 percent of the indigenous terrestrial organisms are endemic, meaning that they are found nowhere else in the world. Zimmerman estimates that 275 immigrant plant species gave rise to some 2,000 endemic species; perhaps 24 ancestral species gave rise to the endemic land snail fauna of over 1200 species. For insects there are over 5,000 endemic species, and a single genus, Drosophila (the fruit fly) has more species in Hawai'i than in all of North America (Zimmerman 58-59). Only in the wide ranging seabird population are endemic species lacking.

Island ecosystems are also characterized in ecological terms by instability. Immigrant species arrive in what has been characterized as an "ecological vacuum" (Zimmerman 59),
and were able to expand and evolve with extreme rapidity compared to other areas of the world. Only a few of the possible plant and animal families, orders, and even classes are represented in Hawai'i. Because so few groups are represented, F. R. Fosberg has noted that island ecosystems tend to preserve "archaic, bizarre, or possibly ill-adapted forms," and are characterized by "extreme vulnerability, or tendency toward great instability when isolation is broken down." He hypothesizes that the arrival of humans would invariably increase the instability inherent in an island ecosystem (5).

The marine biota of Hawai'i, and the variations in the marine habitat, are of much more concern to this research and will be discussed in considerably more detail. Many things which are true of the island land ecosystems are also true for the sea; with the exception of the totally pelagic (open ocean, surface dwelling) fish and the deep sea bottom dwellers, all marine plants and animals are dependent upon shallow seas and the proximity of land for their existence. They too were immigrants to Hawai'i.

The Hawaiian marine biota is characterized, as is the land biota, by both disharmony and attenuation: certain groups of organisms present in other Pacific areas are not found in Hawai'i, and in general fewer species are found than is true elsewhere. Several fish genera, two mollusk genera and two gastropod families present in western Pacific
islands either never reached Hawai'i or did not become established. Fifty-three genera of coral are recorded in the Marshall Islands, but only fifteen are found in the Hawaiian islands. In terms of reef and shore fish, the Marshall Islands have around a thousand species, while Hawai'i has less than five hundred species (Kay, "Introduction" 5).

The rate of endemic species in the ocean is as high as on the land, but there are no endemic families and only three endemic genera. At the species level, twenty percent of the mollusk, forty percent of the crustacean, eighteen percent of the algae, and as much as thirty-four percent of the fish species are endemic (Kay, "Introduction" 4)

For the most part, early marine immigrants to the islands drifted (often in a larval stage) eastward along equatorial currents, arriving in Hawai'i almost exclusively from the west. The marine biota is clearly derived from and part of the Indo-West Pacific area, a great faunal zone extending from the east coast of Africa and including most of the tropical Pacific as far as Easter Island. Once in Hawaiian waters, these immigrants faced the same ecological vacuum, and the same enormous diversity of habitats, which shaped the establishment and ultimately evolution of the land immigrants.

Marine habitats are determined by a complex set of interacting variables. Salinity, turbidity, surge,
temperature, light, bottom topography and composition, the quantity and type of dissolved minerals, and depth are some of the more important variables. Possible classifications of the microhabitats created by particular combinations of variables are themselves varied and technical. Since the problem here is to understand the exploitation of these varied habitats by the Hawaiians, the general classification developed by William Gosline and Vernon Brock will be utilized (See Figure 4). By this classification, three marine environmental zones exist: the inshore and reef zone, the benthic or bottom zone, and the pelagic or open ocean zone. There is both overlap between the zones, and variation within each zone, but this classification is useful in reflecting both technological and social problems faced by the Hawaiians in dealing with their marine environment.

The inshore zone includes the area from highest salt spray at high tide down to a depth of 30 fathoms or about 180 feet. In Hawaii'i this includes all of the reef habitat (as coral is rarely found below depths of 120-180 feet), the tide pool and the intertidal zone generally, and in areas below the surge the greatest biomass to be found on or around the islands (Kay, Hawaiian Marine Shells 6).
Figure 4. Major Hawaiian Maritime Zones

Source: Modified After Newman (59)
In Hawai'i this is an extremely narrow area, in some areas of some islands practically nonexistent. The islands themselves are actually peaks of mountains with steep slopes continuing down into the ocean depths. Repeated emergences and submergences of island shores have limited the formation of erosional terraces where coral could grow. As a result, shallow water areas where coral is dominant probably constitutes only about one third of the inshore zone (Gosline and Brock 8). In some areas the coral forms a fringing reef, varying from a few feet to a mile in width, which protects the adjacent shore from the effects of the surge. The distribution of fringing reef is also varied from island to island, and is extremely limited in the islands generally. (Figure 5 illustrates ocean depth around the islands and the general location of fringing reefs.)

The inshore zone is obviously itself an extremely varied and complicated environment. Bottom substrates may be basalt or calcareous or sandy. Slope may be gradual or perpendicular. Fringing reefs may or may not be present. Large areas of shoreline on Kaua'i, Moloka'i, Maui and Hawai'i are dominated by high sea cliffs (Dept. of Geography 35, 59).

Gosline has stated that the most important factor to marine life on Hawaiian coasts (and probably to people trying to exploit it) is not the tide (which varies only about three feet) but wave action, or surge. Surge will
Source: After Dept. of Geography, Atlas of Hawaii (55)

Figure 5. Ocean Depths and Fringing Reefs
turn a friendly rocky shore, full of easily exploitable resources, into something unrecognizable and deadly (for humans) a few weeks or even days later. The surge affects life below as well as above mean tide level. If the area is semi-protected, like Hanauma Bay on O'ahu, the ocean below ten feet may be unaffected by surge; in other areas the surge may scour the bottom down to depths of 20 feet or more (310). The width of the surge-affected area will vary from one side of the island to another, from one season to another, and from one year to another.

All the inshore zone was an important area of exploitation for the Hawaiians, and the most significant fauna are listed in Figure 6. In the surge-affected area, particularly in rocky intertidal areas, live important flora and fauna. This is a zone of seaweeds and some important mollusks, particularly the types called pipipi and 'opihi by the Hawaiians. A few fish species are restricted to pools along the shore, and the young of larger fish are often found there (Kay, Hawaiian Marine Shells 63).

Further offshore, below the low tide mark, increasing numbers of fish, mollusk and other species are found. In some reef-protected areas the surge may be minimal; in others it may be a major factor determining the environment. Where the area is effected by surge, fewer numbers and species of fish are found than in the subsurge area. Economically this is still an important area however, since
<table>
<thead>
<tr>
<th>Subzone</th>
<th>Hawaiian</th>
<th>Common</th>
<th>Scientific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surge-Affected Area</td>
<td>'opihi</td>
<td>nerite</td>
<td>Nerita picea, Theodoxus neglectus</td>
</tr>
<tr>
<td></td>
<td>leho</td>
<td>cowrie</td>
<td>Cellana sp., Cypraea sp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C. neglectus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>surgeonfish</td>
<td>Family: Acanthuridae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>damsalfish</td>
<td>Family: Pomacentridae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wrasses</td>
<td>Family: Labridae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>parrotfish</td>
<td>Family: Scaridae</td>
</tr>
<tr>
<td>Reef Protected/ Sub-Area</td>
<td>manini</td>
<td>surgeonfish</td>
<td>A. sandvicensis</td>
</tr>
<tr>
<td></td>
<td>palani</td>
<td>surgeonfish</td>
<td>A. dussumieri</td>
</tr>
<tr>
<td></td>
<td>maema</td>
<td>surgeonfish</td>
<td>A. olivaceus</td>
</tr>
<tr>
<td></td>
<td>lauhau</td>
<td>butterfly</td>
<td>Family: Chaetodontidae</td>
</tr>
<tr>
<td></td>
<td>hinalea</td>
<td>wrasse</td>
<td>Thalassoma duperreyi</td>
</tr>
<tr>
<td></td>
<td>kala</td>
<td>surgeonfish</td>
<td>Naso sp.</td>
</tr>
<tr>
<td>Bottom (in holes)</td>
<td>a'g</td>
<td>squirrelish</td>
<td>Myriptistis sp.</td>
</tr>
<tr>
<td></td>
<td>'ala'ihi</td>
<td>squirrelish</td>
<td>Holocentrus sp.</td>
</tr>
<tr>
<td></td>
<td>upapalu</td>
<td>cardinalfish</td>
<td>Family: Apogonidae</td>
</tr>
<tr>
<td></td>
<td>ula</td>
<td>lobster</td>
<td>Panulirus penicillatus</td>
</tr>
<tr>
<td></td>
<td>puhi</td>
<td>moray eel</td>
<td>Family: Muraenidae</td>
</tr>
<tr>
<td>Inshore Pelagic</td>
<td>'opelu</td>
<td>mackerel scad</td>
<td>Decapterus pinnulatus</td>
</tr>
<tr>
<td></td>
<td>'aha</td>
<td>needlefish</td>
<td>Family: Belonidae</td>
</tr>
<tr>
<td></td>
<td>iheihe</td>
<td>halfbeak</td>
<td>Family: Hemiramphidae</td>
</tr>
<tr>
<td>Other Inshore Habitats</td>
<td>kahala</td>
<td>jack</td>
<td>Family: Carangidae</td>
</tr>
<tr>
<td></td>
<td>ula</td>
<td>jack</td>
<td>Family: Carangidae</td>
</tr>
<tr>
<td></td>
<td>he'e</td>
<td>octopus</td>
<td>Ooctopus cyanea</td>
</tr>
<tr>
<td></td>
<td>papai</td>
<td>crabs</td>
<td>Brachyura</td>
</tr>
<tr>
<td></td>
<td>wana</td>
<td>sea urchin</td>
<td>Echinoderm sp.</td>
</tr>
<tr>
<td></td>
<td>'ina</td>
<td>sea urchin</td>
<td>Echinometra sp.</td>
</tr>
<tr>
<td></td>
<td>leho</td>
<td>cowries</td>
<td>Family: Cypraeidae</td>
</tr>
<tr>
<td></td>
<td>pupu'al a cones</td>
<td>Family: Conidae</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pipi</td>
<td>pearl oyster</td>
<td>Family: Pteriidae</td>
</tr>
</tbody>
</table>

Sources: Gosline and Brock; Tinker; Titcomb, Native Use of Fish.

Figure 6. Significant Fauna of Inshore Zone
along with a variety of damselfish and wrasses Gosline notes that on relatively calm days large "grazers" such as members of the surgeonfish family and the several species of parrotfish, or uhu, are found in abundance (211).

In reef protected areas, or areas below the surge, the numbers of species of fish increases greatly. Here are found more of the larger surgeonfishes: manini, palani, maemae, and the kala. Many members of the huge and popular (to Hawaiians) wrasse family are also found in areas unaffected by the surge, particularly the hānālea.

In holes on the bottom exists a vast faunal complex, with the most common fish belonging to the squirrelfish family. This includes the fish called ū'ū in Hawaiian (better known today by its Japanese name, menpachi), and the 'ala'ihi). Other hole-dwellers include cardinal fish ('upāpalu), moray eels (pūhi), and lobster (ula).

In the upper levels of the inshore zone are also to be found fish which range further out to sea, including an important fish in traditional Hawai'i, the 'opelu or mackerel scad. Larger members of the jack family range from the surface to the bottom, including the several species termed kāhala and ulua in Hawaiian (Gosline and Brock; Tinker; Titcomb Native Use of Fish).

The inshore area is also home to approximately 1,000 species of mollusk, the most spectacular of which are found in reef areas at depths of from 30 to 150 feet. About eighty
percent are gastropods or snails, and most of the rest are bivalves; however, cephalopods including the he'e, or octopus, are also present on the reef flats and other areas with a rocky substrate. Snails include the many species of cowrie (leho) and cone (pūpū-'alā) utilized for various purposes by the Hawaiians. In rather limited habitats (particularly sheltered bays) were found important bivalves like the pearl oysters. Other specialized habitats in the inshore zone provided shelter for a variety of other marine invertebrates, particularly crabs (generally called pāpa'i) and sea urchins called wana and 'ina (Kay, Hawaiian Marine Shells; Titcomb, Native Uses).

The second major zone is the benthic or bottom habitat, extending from 30 fathoms (180 feet) down to about 200 fathoms, or 1200 feet. Below 200 fathoms the ocean deep probably was not exploited by the Hawaiians, and will not be considered (Newman 11). In the benthic zone there is no live coral reef, and few mollusks are found; the fish inhabitants are the least known of any zone. Benthic fish generally are oriented to "a fixed locale, to physical features of the bottom itself," and are known to like rocky areas with good topography (Gosline and Brock 8).

The most important benthic fish include the snappers, the groupers, a few of the jacks (particularly the jack crevalle or ulua and the amberjack or kāhala), and a few of the goatfish. As is true in the inshore zone, there is a
certain vertical zonation to the fish found on the ocean bottom. Recent research by Stephan Ralston has indicated that although some species of fish are found throughout the benthic zone, certain species cluster together at different depths. A summary of the important benthic fish, and their specific depths, can be found in Figure 7.

In many areas off Hawaiian shores the bottom drops off steeply from the 30 fathom level to depths greater than 200 fathoms. Thus the benthic is a very limited zone around each island. However, the maximum depth between Maui, Lāna'i, Kaho'olawe and Moloka'i is less than 100 fathoms, and they thus form one continuous "bank" for bottom fishing. In addition, the 200 fathom bathymetric line incorporates a vast bottom area west of Moloka'i called the Penguin Bank. (See Figure 5.)

The pelagic zone is the third major zone, and includes the upper surface of the ocean down to about 600 feet. The inshore pelagic zones, where the actual water depth is less than 100 fathoms, ultimately overlaps with the inshore and reef zones as defined here. Certain fish species are basically restricted to this inshore pelagic zone, and including the 'opelu (mackerel scad) and the akule (big-eyed scad).

Most of the fish in the pelagic zone are of species which are completely independent of the proximity of the
<table>
<thead>
<tr>
<th>Depth</th>
<th>Hawaiian</th>
<th>Common</th>
<th>Scientific</th>
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</thead>
<tbody>
<tr>
<td>30-70 fathoms</td>
<td>ulua</td>
<td>jack crevalle</td>
<td>Cranx sp.</td>
</tr>
<tr>
<td></td>
<td>kāhala</td>
<td>amberjack</td>
<td>Seriola dumerilii</td>
</tr>
<tr>
<td></td>
<td>uku</td>
<td>gray snapper</td>
<td>Aprion virescens</td>
</tr>
<tr>
<td>40-120 fathoms</td>
<td>ulua</td>
<td>snapper</td>
<td>P. filamentosus</td>
</tr>
<tr>
<td></td>
<td>kāhala</td>
<td></td>
<td>Apherus rutilans</td>
</tr>
<tr>
<td></td>
<td>ōpapaka</td>
<td>snapper</td>
<td>Tropicinius zonatus</td>
</tr>
<tr>
<td></td>
<td>lehi</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ūkikiki</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 100 fathoms</td>
<td>'ula'ula</td>
<td>red snapper</td>
<td>Etelis carbunculus</td>
</tr>
<tr>
<td></td>
<td>ehu</td>
<td>red snapper</td>
<td>E. marshi</td>
</tr>
<tr>
<td></td>
<td>kalikali</td>
<td>pink snapper</td>
<td>P. sieboldii</td>
</tr>
</tbody>
</table>

Source: Stephan Ralston (23-24)

Figure 7. Significant Fish of the Benthic Zone
bottom or of any land mass. Figure 8 presents a summary of
the most important pelagic fish, three of which were
particularly important to the Hawaiians. Right at the
surface could be found the *aku*, or skipjack tuna, as well as
the yellowfin tuna (one of several large tunas termed 'ahi
in Hawaiian). Malolo or flying fish were also found near
the surface. Slightly below the surface were two types of
tuna called albacore and bigeye, both referred to as 'ahi in
Hawaiian (Gosline and Brock; Titcomb, Native Use of Fish).

While almost any fish can be found in zones other than
its primary habitat, certain carnivores are regularly found
almost anywhere. Barracuda (*kākū*), although basically a
pelagic fish, can often be found close inshore. Hawai'i
also has over forty species of shark, and some shark species
are present in all three zones (Tinker 1-45). The most
common Hawaiian name for sharks was manō, but one species
was called niuhi. This is the pelagic great gray or white
shark (Titcomb, Native Use of Fish 107).

In addition, species of whale and dolphin frequent the
islands seasonally, often coming close to land. Generally
terted palaoa, they were occasionally found as drift animals
on shore. From the Hawaiian perspective they were probably
the least important resource the ocean had to offer, and
they were not deliberately hunted (Malo, Hawaiian
Antiquities 211).
<table>
<thead>
<tr>
<th>Area</th>
<th>Hawaiian</th>
<th>Common</th>
<th>Scientific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inshore</td>
<td>'ōpelu</td>
<td>mackerel scad</td>
<td>Decapterus pinnulatus</td>
</tr>
<tr>
<td>Pelagic</td>
<td>akule</td>
<td>big-eyed scad</td>
<td>T. crumenophthalmus</td>
</tr>
<tr>
<td></td>
<td>kawakawa</td>
<td>black skipjack</td>
<td>Euthynnus affinis</td>
</tr>
<tr>
<td></td>
<td>mūhe'e</td>
<td>squid</td>
<td>Sepiotheuthis lessoniana</td>
</tr>
<tr>
<td>Deep Water</td>
<td>ono</td>
<td>makerel</td>
<td>Acanthocybium solandri</td>
</tr>
<tr>
<td></td>
<td>aku</td>
<td>skipjack or</td>
<td>Katsuwonos pelamis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bonito</td>
<td></td>
</tr>
<tr>
<td></td>
<td>'āhi</td>
<td>yellowfin</td>
<td>Thunnus albacares</td>
</tr>
<tr>
<td></td>
<td>'āhi</td>
<td>albacore</td>
<td>T. alalunga</td>
</tr>
<tr>
<td></td>
<td>'āhi</td>
<td>bigeye tuna</td>
<td>T. obesus</td>
</tr>
<tr>
<td></td>
<td>malolo</td>
<td>flying fish</td>
<td>Family: Exocoetidae</td>
</tr>
<tr>
<td></td>
<td>mahimahi</td>
<td>dolphin fish</td>
<td>Coryphaena sp.</td>
</tr>
<tr>
<td></td>
<td>'a'u</td>
<td>marlin</td>
<td>Family: Istiophoridae</td>
</tr>
<tr>
<td></td>
<td>a'uku</td>
<td>swordfish</td>
<td>Xiphias gladius</td>
</tr>
<tr>
<td></td>
<td>kākū</td>
<td>barracuda</td>
<td>Sphyraena barracuda</td>
</tr>
<tr>
<td></td>
<td>niuhi</td>
<td>gray shark</td>
<td>Carcharodon carcharias</td>
</tr>
</tbody>
</table>

Sources: Gosline and Brock; Tinker; Titcomb, Native Use of Fish.

Figure 8. Significant Fauna of the Pelagic Zone
All the above species and more constituted the marine resources of Hawai'i when the earliest Polynesians began their colonization. While particular endemic species were unfamiliar, the marine biota was basically similar to that in areas of Polynesia such as Tahiti or the Marquesas. Compared to those areas, Hawai'i had fewer species and fewer fish, due both to its northerly latitude and its relative lack of coral reef habitat. Nonetheless, the new immigrants were probably able to adapt quickly to their new maritime environment.

HAWAI'I TO 1778

To some extent understanding precontact Hawai'i is dependent upon understanding prehistoric developments up to that time. Given the fact that Polynesian archaeology did not begin until 1950, it is only within the last fifteen years that problems have been clearly stated and major works attempting some kind of synthesis have appeared (Bellwood; Jesse Jennings; Kirch, Evolution). A concern related to this research is the reason for the level of sociopolitical development that existed in Hawai'i, regardless of whether or not it is termed an advanced chiefdom or a pristine state. An additional major concern is to examine what the archaeological evidence shows with respect to whether or not Hawai'i in the time period immediately prior to 1778 showed evidence of being a culture in equilibrium or in disequilibrium.
A brief synopsis of the current understanding of Hawaiian prehistory will therefore be presented. By AD 300-500 at least four islands (Moloka'i, O'ahu, Kaua'i and Hawai'i) were settled (Kirch, Evolution 244). Initially there must have been a very heavy dependence upon fish and shellfish, and this tends to be indicated by the archaeological evidence. Without question these early immigrants brought with them a sophisticated knowledge of marine ecosystems and methods to exploit them; without such knowledge and methods the ancestors of the Polynesians could not have initially ventured into the vast Pacific (Kirch, Evolution 59-62).

The early immigrants were also members of a highly successful horticultural society, and brought numerous domesticates with them. Domesticated animals included the pig, the dog, and the chicken. More important were the domesticated plants, which included taro, yam, breadfruit, banana, sugar cane, coconut, Polynesian arrowroot, the candlenut or kukui tree, and the paper mulberry, or wauke.

Particular relations of production, reflected to some extent in social and political institutions, were also transferred to Hawai'i, but these are very difficult to reconstruct. Linguistic evidence indicates that concepts of status differences between senior and junior siblings of the same sex were present, an important point since this is a fundamental principle of rank in Polynesia. Chiefs probably
existed who were heads of descent groups, and perhaps
descended from a long line of eldest sons, reflecting the
general Polynesian importance of the hia po, or first born
coupled with superior male status. In any case, it appears
probable that the institution of hereditary chieftainships
had already developed before the Polynesians came to
Hawai'i. These chiefs probably also had certain religious
functions which validated their higher status, and concepts
of tabu and mana must have predated entrance to Polynesia
(Kirch, Evolution 62-67). Exactly what the relations of
production might have been is impossible to state, but
certainly the early immigrants were representatives of the
kinship mode of production in Wolf's definition.

Between 500 and 1200, the early immigrants established
settlements in the permanently watered valleys of all the
islands. Predominantly this meant the windward sides, where
shifting or swidden cultivation (involving lengthy fallow
periods and burning) combined with simple pondfield
irrigation (Kirch, "Ecology and the Adaptation" 3). In
addition, many areas along the leeward coasts were probably
visited by fishermen whose permanent residence was in some
agriculturally productive windward valley.

From about 1000 to 1200 the legendary prehistory of
Hawai'i states that a period of voyaging to and from Tahiti
took place, which ultimately introduced many innovations to
the Hawaiian Islands. Abraham Fornander recorded that a new
chiefly line was started, and subsequent heiaus (temples) were built with four walls so that priestly rites could be performed in secret. During and after the migratory period, several varieties of the gods Kane, Ku, and Lono appeared in the legends as separate deities; these included Kane-makua, a god worshipped by fishermen after mālolo (flying fish), and Ku-'ula, who with his wife Hina were the major dieties of fishermen (An Account 2: 59-60).

Perhaps the most significant innovation was that the social distance between the ali'i (chiefs) and maka'āinana (commoners) widened. From now on every chief would have to prove his genealogy and connections before a special committee. Tabus become more stringent, and violaters could be put to death (Fornander, An Account 2: 62-63).

Archaeologically, there is only limited evidence of a voyaging period between Hawai'i and Tahiti (Kirch, Feathered Gods 66). To at least one archaeologist the traditional history "sounds suspiciously like external justification for internal consolidation of elite power" (Tuggle 189).

Archaeologists do see a change in Hawaiian adaptation which coincides with the traditional voyaging period at approximately 1100. A second phase of prehistory begins then and lasts until about 1650. Increasing demographic pressures led to permanent settlement of arid leeward slopes on all islands, even those which had no permanent water supply (Kirch, Feathered Gods 303-306). Kaho'olawe, Lāna'i
and probably Ni'ihau were all inhabited during this time period. These islands, as well as large areas on the larger islands, have less than 30 inches of rain a year, making drought a major problem.

Settlement in these dryer areas was possible primarily by sweet potato cultivation and the development of permanently defined dryland field systems employing crop rotation. The new system was so productive that it permitted the increased conversion of plant foods to animal protein in the form of hogs. Kirch believes that an increase in pig husbandry was definitely associated with the dry land field systems (Evolution 179). In legend this was also a period of intensive construction of fish pond and fish traps; archaeologically most of them do appear to have been built after the fourteenth century (Kirch, Evolution 180).

During the late prehistoric period, from about 1600 to 1778, some areas of Hawai'i probably reached the limits of intensification, regardless of how this intensification was accomplished. The best known area archaeologically is that of west Hawai'i, where three large dryland field systems were well developed by 1650. By late prehistoric times all arable land in west Hawai'i below 800 meters "had been converted to agricultural production" and even ecologically marginal land was cultivated (Kirch, Evolution 187-188). In addition to west Hawai'i, dryland agricultural systems
became the dominant type in parts of Maui (Kirch, *Evolution* 189). On O'ahu, Kaua'i, and Moloka'i irrigated taro agriculture was dominant, and intensification involved building extensive stone-faced terrace and irrigation systems.

There is some archaeological evidence that agricultural intensification had led to environmental depletion, at least in a few areas. Kirch noted that it is a "popular orthodoxy" that indigenous people live in a kind of "symbiotic harmony" with their environment ("Impact" 1). While the destruction may have been limited, the above quote is not entirely valid. Kirch ("Impact") has documented a wide variety of environmental changes induced by the Hawaiians, in part because their idea of a landscape was a domesticated one.

The Hawaiians introduced several new animal species to the islands. Besides the pig, dog and fowl, the early settlers also brought, probably inadvertently, a species of rat plus geckos and skinks. Some of these animals became competitors or predators of the many indigenous bird species. In addition, agriculture required the increasing destruction of lowland forests. As a result of these changes in their environment, plus also probably as a result of direct human predation, thirty-eight bird species, many of a flightless variety, became extinct in the prehistoric
period. Several land mollusk species also became extinct due to the destruction of their habitat (8-9).

As each valley with permanent water was turned into an irrigation system with vast pondfields, the general area of marsh-like land was increased, creating habitats for ducks and other waterfowl. Slope erosion also increased and in some cases undoubtedly affected the shoreline and hence the marine habitat. In Kahana Valley on O'ahu alluvial deposits caused by prehistoric agricultural runoff are found on top of marine sands some 2,000 feet from the present day shoreline (Kirch "Impact" 10). Kawainui Marsh on O'ahu at the time the area was first inhabited may have been a marine embayment, fully open to the sea. Subsequent fishpond construction combined with erosion caused by swidden agriculture probably created the marsh conditions found historically (Kelly and Clark 72-73; Kirch, "Impact" 10-11).

Perhaps the best example of environmental depletion to date comes from Kaho'olawe. Coastal regions of the island were probably settled around 1000-1200, but the dry inland areas were not cultivated until 1400-1500. The removal of the native plant cover through burning to clear the land for agriculture, and through the need for fuel, caused massive erosion by 1550. Inland population and total island population declined rapidly. By 1750 the inland was basically abandoned since cultivation had become almost impossible. Archaeologist Robert Hommon, who has
reconstructed the above scenario, also found evidence of "the qualitative and quantitative decline in near-shore marine resources" due to the destruction of coral reef areas by sedimentation (National Register 66). Research may yet prove that these are not isolated cases.

Thus clearly Hawaiian practices could cause environmental depletion. Nonetheless, Hawaiian culture essentially maintained an equilibrium with the environment, both by controlling resource use and by limiting population growth. With regard to marine resources, as will be shown, many of their practices functioned to conserve resources and to prevent environmental depletion. While Hawaiians were not necessarily consciously practicing conservation, their ability and their motivation to radically alter the environment was extremely limited compared to a capitalist mode of production. While "popular orthodoxy" unhelpfully stresses a conservationist ethic which probably never existed, it is just as much a distortion to equate Hawaiian effects on their environment with that which began in the post contact period.

Kirch ("Impact" 4-5) believes, however, that in west Hawai'i environmental depletion had lowered the carrying capacity of the land. He argues that it is highly significant that the most competitive and politically powerful chiefdoms developed out of this area (Evolution 204). Both Hommon (Formation 278) and Kirch (Evolution 109)
believe that in west Hawai'i population growth had been forced to a halt, and a situation of near-zero growth prevailed throughout this period. As all land and presumably ocean resources were intensified to the limits of the existing mode of production, the only recourse for status-conscious chiefs was to increase the resource base by military expansion and occupation of other areas. This created the extremely unstable political situation which is recorded in tradition throughout the 18th century, particularly on Hawai'i. The wars of Kamahemaha I represented a continuation of the traditional pattern of expanding the economic base of west Hawai'i.

On other islands potentially arable land may have remained uncultivated and presumably carrying capacity and demographic limits had not yet been reached. On Kaua'i at least, archaeologist Timothy Earle reports that irrigation terracing had not yet expanded to its limits on northern Kaua'i slopes, and that there was considerable land suitable for dryland agriculture which had not been utilized (Earle, \textit{Control Hierarchies} 113). The same may be true for other islands.

Earle has suggested that overall Hawaiian population remained fairly stable after 1600 due to the limits of protein production rather than plant production (\textit{Control Hierarchies} 41). The major protein source on all islands was fish. Pigs and dogs were primarily fed domesticated
plants, and both were competing directly with humans for food and land.

Another archaeologist, Stephan Beckerman, has provided support for this view by proposing that population on all Polynesian islands was limited by the availability of protein. Working on the assumption that most protein came from reef fish, Beckerman attempted to show that there is a high correlation between length of shoreline and population in Polynesian islands, including the eight Hawaiian Islands. In a rebuttal to this, it was pointed out that in the case of the Hawaiian Islands there is no correlation between length of the shoreline and length of the reef, since much of the shoreline has no reef (Hunter-Anderson and Zan). The Hawaiian Islands, in other words, supported far higher human populations than could be predicted on the basis of available reef. As will be discussed, this is almost certainly due to the existence of significant benthic and pelagic fisheries as well as the most extensive use of aquaculture in Polynesia.

Nonetheless, protein may have been a limiting factor on some Hawaiian islands, and may well have been one source of competition between chiefs. As already noted (see Figure 5), the benthic zone was unequally distributed among the islands. Exploitation of the pelagic zone, as will be discussed, may have been possible only with the control of resources which were also unequally distributed. Major
fishponds and fishtraps were another form of protein intensification, but again as will be shown these were not equally distributed among all the islands. The island of Hawai'i had relatively little access to benthic areas and to major fishponds and fishtraps, and may indeed have reached its ecological limits of intensification by 1778.

The reconstruction of the Hawaiian maritime system which follows will demonstrate that while maritime exploitation basically functioned in equilibrium with the environment, cultural equilibrium did not exist. As much as any other factor, this was due to the unequal distribution of maritime and related resources.

MARITIME MODE: INTELLECTUAL AND MATERIAL ASPECTS

A major part of a culture's infrastructure consists of material and intellectual means "that the members of a society implement ... in order to work upon nature and to extract from it their means of existence, thereby transforming it into a 'socialized nature'" (Godelier 763). In Hawai'i, the sea as much as the land was a "socialized nature" by 1778. The Hawaiians had developed elaborate classification systems for both marine habitats and inhabitants, and their success at exploiting the sea depended in large measure on detailed knowledge of the ecosystem.

Kirch, in "The Ecology of Marine Exploitation", has calculated that the Hawaiians utilized at least 2,547
species of marine fauna from five major groups, including the stony corals, the sea urchins, mollusks, crabs, and fish (457). Whales and porpoises were also occasionally exploited, and in addition, over thirty species of ocean flora were utilized (Abbott 1). Most of these approximately 2,600 species were eaten for food, and this diversity would decrease the possibility that any one species would be over-exploited. In addition, certain species were valuable as religious offerings, had medicinal functions, or were used for tool manufacture or decoration.

Gosline and Brock have concluded that at the time of Cook the Hawaiians "knew more about the fishes of their islands than is known today" (1). The same thing is probably true of the sea environment as a whole: modern marine biologists are only now accumulating information once known by the Hawaiian fishermen. Given the central position of the ocean in Hawaiian culture as the major supplier of protein as well as countless other useful items, it is not surprising that the Hawaiians were such perceptive observers of their ocean ecosystem; for them it was not just a question of livelihood but of cultural survival.

The perception of Hawaiian eyes is clearly revealed in the marine faunal classification systems which have survived to the present. The Hawaiian terminology has been recorded in two works by Titcomb (Native Use of Fish; Native Use of Marine Invertebrates), and probably represents a system
similar to that in use at contact. Names which have survived are obviously names which have remained in use, at least by fishermen; it is certainly quite possible that species for which no Hawaiian term is available represent animals whose use, and name, have been forgotten. This appears to be the case with edible ocean flora. Abbott discovered that most of the edible algae found in Hawai'i have no Hawaiian name, and concluded that both the name and usage have probably been lost, as it seems unlikely that the Hawaiians had missed discovering anything edible in the ocean (1). In the case of fish many names have survived although information as to habitat and method of capture have been lost (Titcomb, Native Use of Fish 48).

Principles of classification which were used do not always coincide with the Linnaean taxonomic system, which primarily emphasizes morphology. Although morphological similarities were used in the Hawaiian system, the Hawaiians were more concerned with habitat, behavior, economic use, color, and sometimes life-cycle stages in developing their taxonomy. Hence what is one species in Linnaean taxonomy may have more than one name in Hawaiian, while in other cases several species may have the same Hawaiian term (Titcomb, Native Use of Marine Invertebrates 327). The Hawaiian system was practical in the sense that it emphasized traits relevant to the culture.
Not all of the hundreds of names would have had to be learned by even the fishermen, as not all types were found in all localities. Still, the task of learning the names, habits and habitats of so many animals was tremendous, and Titcomb suggests that memory aids, including chants, were utilized (Native Use of Fish 49).

The ocean, generally termed kai in Hawaiian, actually had a variety of names relating to variations of surge, tide, substrate and the major plant and animal life to be found in the various habitats. The edge of the ocean, where waves break over the land, was called 'ae kai; if shallow seas came in without breakers, due to a fringing reef, the area inside the reef was termed kai kohala. On the land side of a kai kohala was the kai 'elemihi, named for the 'elemihi crab; on the seaward side was the kai haha pāpa'i, or sea to feel for pāpa'i crabs. Moving outward from shore zone after zone is described, including a kai paeaea, or sea for pole fishing, the kai kaka uhu, the sea for netting uhu, the kai lu he'e, or sea to catch octopus with lures. Further out are the kai mālolo and the kai hi aku, named for their most common fish, and furthest out are the ko'a hi kāhala and the ko'a hi 'ahi, the fishing grounds (ko'a) for these large fish. Besides additional names for habitats, there were names for seas of different colors, for seas with different types of waves, for seas rising or falling with the tide. The very nature of the language forced Hawaiians
to observe details about the marine environment that only highly trained eyes might observe today (Kamakau, Works 10-13; Malo, Hawaiian Antiquities 25-26; Pogue 16-18).

The phases of the moon determine not only the tides but also the nocturnal habits of many marine animals. In addition, it has been discovered that many reef and inshore fish spawn during certain phases of the moon, a fact that marine ethnologist R. E. Johannes has discovered was recognized by at least some oceanic fishermen long before it was known by modern marine biologists (Words of the Lagoon Chapt. 3). The Hawaiians had developed a twelve month, thirty day lunar calendar which recognized that specific days and nights would be optimum for fishing.

The most vivid description of this has been left by Kepelino, in Kepelino's Traditions of Hawaii by Martha Beckwith. The evening of Hilo (the first day of the new moon) was both dark and presented an ocean at low tide: "On this night the women fished by hand (in the pools left by the sea) and men went torch fishing ... on the river-banks people caught gobey-fish by hand and shrimps in hand-nets in the warm water" (100). The fifth day of the month, Ku-kolu, was described as excellent for all kinds of fishing (at least during the summer months): "The sea is filled with fleets of canoes and the beach with people fishing with poles and with women diving for sea-urchins, ... gathering limu, spreading [fish] poison, crab fishing, squid spearing..."
and other activities" (102). Kepelino continued his day to
day description of good and bad days for fishing throughout
the month.

Annual cycles were also recognized in fishing, primarily
correlated with prevailing winds, the wet/dry seasons, and
the spawning seasons of certain fish. Each month tended to
be identified with certain activities, and many of these
involved fishing. Malo noted that in the month of Kaulua or
February the 'anae (mullet) spawn, while the māolo or flying
fish "swarmed in the ocean" during March (Hawaiian
Antiquities 31). Kamakau described February as a time of
small fish, when fish were not easily available inshore
since storms filled the oceans with mud and prevented deep
sea fishing; people subsisted on limu washed up on the beach
and fish in ponds. He also noted that summer months were
all good for fish catching, and fish were dried and packed
in gourd containers. One month, Welo (August-September
according to Kamakau) was in part named for the little
streamers or tentacles (welowelō) of the octopus as the
animals were hung to dry in the sun (Works 14-16).

The actual fishing methods of the Hawaiians are perhaps
the best illustration of the detailed knowledge they
possessed about the ocean environment. Both the tools and
the methods used for exploiting the ocean were more
complicated than those of the land. Agriculture was of
great importance for Hawaiians, and certainly required
elaborate knowledge (Handy and Handy). Yet a farmer had to know the ecological requirements of relatively few species and detailed information on relatively few microhabitats. In Hawai'i the basic and almost the only agricultural tool was the simple digging stick or 'ō'o. In contrast, the exploitation of the ocean required knowledge of about 2,600 species occupying three major ecological zones and hundreds of microhabitats. Exploitation required an elaborate technology and a variety of highly specialized strategies and methods.

Although many fishing strategies were designed for specific fish, in practice this meant that certain methods were applied in particular ways to the inshore, benthic and pelagic zones. The most important methods used in these three zones will be discussed individually.

**Techniques of the Inshore Zone**

The inshore zone as defined here (from the highest wave-affected area to a depth of 180 feet) included probably the largest number of microhabitats and the largest marine biomass of any zone. It is therefore not surprising that this zone included the most numerous techniques for exploitation. Some form of almost every technique, from hand gathering to various types of nets and angling, could be utilized in the inshore zone.

Hand gathering, particularly at low tide and frequently at night, was a common method and required no specialized
tools or knowledge. Kahaulelio referred to torch fishing by hand as a method practiced "by those without nets or who don't know how to fish" (99). Fish, crabs, sea urchins, a large variety of mollusks including octopus, and sea weeds were among the foods which could easily be gathered by hand in certain areas. Turtles and even sharks were also grabbed by hand in shallow waters. Kamakau claimed that to Hawaiians the "shark was a horse to be bridled," and that some individuals at least would ride sharks into shore and kill them (Works 88). Whales which drifted ashore were also "collected," and this was the only way of acquiring them, as they were apparently not deliberately hunted by Hawaiian fishermen (Malo, Hawaiian Antiquities 211).

In connection with both hand gathering in shallow waters and diving in deeper waters, spear fishing was an important technique. Hawaiian spears were simple sharpened wooden poles, about six to seven feet long and manufactured out of some of the harder available woods. Fish, eels, and particularly octopus could be speared on the reef flats at low tide. Octopus might be so common that at low tide "the reef floor would be furrowed as if rooted by pigs, with burrows scattered in every direction, and the he'e [octopus] spread out like lumps of dark earth, with heads swaying." Spear fishermen would simply walk through the shallow water, taking great quantities. "When an octopus was speared in its hole, it twined its tentacles around the spear and came
out.... The spearing went on until the tide came in, then the fishermen went ashore...." (Kamakau, Works 70).

Spears were also used in diving for fish, particularly those which lived in holes at the bottom. Emma Beckley has described this method in some detail, and very probably it was practiced in the same fashion at contact. Spear fishermen swam down and waited at the holes; when the fish came by, several could be taken at once, with those speared initially simply pushed up the spear handle to make room for more (1-2). Kamakau recorded similar methods, adding that some spear fishermen "really chased the fish in the sea." Others swam out to deeper water, dived and then "crouched sideways with one foot thrust out for support, with the spear ... held upward ... like a man shooting plover--and lunged with the spear and pierced whatever fish they chose" (Works 86).

Kamakau also stated that sharks were never speared and did not trouble the fishermen, who viewed them as "fighting companions" (Works 86). Only men who had a shark 'aumakua (spiritual guardian) were likely to become spear fishermen in deeper waters. Kahaulello, himself a skilled fishermen using other techniques, called spear fishing "a fishing of death," since "it is clear that you are practically placing your body between the teeth of sharks" (84-85). Many westerners were impressed with the fearless behavior of Hawaiians who readily swam among sharks (e.g. Portlock 159).
Diving skills were essential not only for the deep water spear fishermen but for many of the techniques involving net fishing. Kamakau (Works 86) claimed that divers could reach depths of 200 feet. John Mears, who visited the Islands in 1788, was one of many captains to have problems with broken anchor lines, cut by coral or (at least so many captains suspected) by Hawaiians. Having lost one anchor in 30 fathoms (180 feet) of water, Mears was furnished with six Hawaiian divers to recover it. After fortifying themselves with "several calabashes of poi," the divers submerged. Another captain acted as timekeeper and recorded that four divers were down five minutes, one six minutes, and the sixth, who reached and cleared the anchor, seven and a half minutes. This last man was bleeding from mouth and nose when he surfaced, and all decided that the anchor was too deep to recover. Later, Mears lost another anchor in 20 fathoms of water (a mere 120 feet) and it was easily recovered by divers (16-17). Since Japanese pearl divers and Greek sponge divers are known to frequently dive to depths of between 100 and 200 feet, and breath-hold dives were recorded in the 1970s of over 300 feet, with elapsed times of over four minutes, there is no reason to doubt these stories (Earle and Giddings 92-94).

Diving skills were often utilized in another method, trapping. Woven basket traps made from aerial roots of the 'ie'ie vine were used both in freshwater streams (for shrimp
and the o'opu fish) and the inshore zone of the ocean. Several sources speak to the time and care spent in the manufacture of traps, not only in terms of labor but because of associated kapus. Hinalea, eels, palani, and kala are the fish most commonly mentioned as being trapped in baskets, and different shapes and sizes of traps were manufactured for different species. In some cases the fish were "tamed" before being trapped. Kala were fed for several days with limu kala, "morning, noon and evening" according to Kamakau (Works 84), until finally the traps, also baited with limu, were placed by divers and the fish were taken. Palani also were caught by first establishing "feeding stations" using sweet potatoes for bait (Pele; Pogue 23; Buck 312-324).

Inshore fish were sometimes caught in tide pools and on reefs by the use of a poison, derived primarily from a shrub termed 'auhuhu. The plant was pounded and placed in crevices and cracks; all fish in the vicinity were stunned and floated to the surface, where they could easily be gathered by hand (Stokes, "Fish-Poisoning").

Octopus lures were one of the better known artifacts manufactured to exploit the inshore zone. Cowrie shell lures (see Figure 9) were complicated five-part devices, each composed of a specially chosen cowrie shell and stone sinker, plus a wooden stem, a bone hook, and a hackle or tail of ti leaves, all rather elaborately lashed together
and attached to a line long enough to permit fishing in up to 120 fathoms of water (Buck 359). The primary species utilized was the humpback cowry although tiger cowries were used on occasion; these shells were recovered from the inshore area by diving (Titcomb, *Use of Marine Invertebrates* 342).

Appropriate shells and stones for leho he'e (octopus lures) were carefully chosen and highly prized. According to Kahaulelio "the shell and stone must fit well before the squid of the deep sea could be caught. It is like a beautiful woman that should match well with a man, so it is with this" (30). Malo lists twenty four varieties of stone which could be used to make these lures (*Hawaiian Antiquities* 19), and Kahaulelio says the shells were often named after the stone. Cowrie shells were sometimes smoked over a fire, while being licked with the tongue to prevent cracking, in order to bring out a color especially attractive to the octopus. The animals would not seize an unattractive shell, but for an attractive shell they would practically follow it right into the canoe (according to Kamakau) and the fisherman stopped only for fear the salt water would dim his shell (Kahaulelio 31; Kamakau, *Works* 67-69; Beckley 3).

Octopus were also taken by the 'ōkilo he'e method, although this could be done only in shallow water and required a very experienced eye. A stone, wooden stem and
Single Piece Hooks

- Rotating
- Jabbing

Two Piece Hooks

- Bonito (Aku) Lure
- Large Shark Hook

Octopus Lure

Sources: After Buck; Kirch, *Feathered Gods.*

Figure 9. Fishhook Types
(Not to Scale)
hook were bound together, with a few flower blossoms such as the nohu attached. The fisherman used chewed up pieces of kukui nut to clear the water, visually spotted the octopus, and then let down the lure. As Kamakau noted, "The fisherman who ... [used] this method had to learn all the ways of the octopus before he could become skillful" (Works 69).

Nets of various sizes and types, frequently designed for one particular fish species, were commonly used in the inshore zone, and are one of only two fishing techniques mentioned by anyone in Cook's ships (Samwell in Beaglehole 2: 1184). Not only were nets some of the more productive fishing implements, their manufacture was complex and required an additional set of specialized tools to accomplish.

Fishing nets were manufactured almost exclusively of olona fiber, although cord made from hau bark was also utilized. In all probability the early Polynesian immigrants to Hawai'i were familiar with net making, but olona is a Hawaiian endemic and its potential for net fiber had to be discovered. Olona requires a wet habitat, and grew around taro ponds and in upland areas with plenty of rainfall. The process of removing the fiber also required running water and several days of scraping with a shell scraper. The fiber was then twisted into cord and braided for the appropriate thickness desired in the line or fish
net, and was also dyed by soaking it for several days in a mixture of water and *kukui* bark (Funk 16-17; Stokes, "Hawaiian Nets" 105-196).

The actual manufacture of the net required the use of special netting needles or shuttles (of wood or bone or whale ivory), mesh gauges (commonly of turtle shell), and wooden net menders called *ki'o'e*, used not only to mend nets but to join pieces together. The large gill and seine nets also required the attachment of net floats, usually cut from light wood such as the *hau*, and of stone sinkers (Stokes, "Hawaiian Nets"; Buck 290-298).

In the inshore zone, four basic types of nets were used: hand, gill, seine, and bag nets, the last two frequently in combination. Details of net construction within these four basic types, such as mesh size, net size, and even materials used, varied depending upon what type of fish was the intended prey. "The selection of the net depended upon the kind of fish desired by the fisherman" (Pogue 21).

Small hand nets were either of the scoop type, fitted to an oval frame, or a dip net, a square or rectangular piece of netting tied to the arched end of two crossed sticks (Buck 299-305). Such nets could be used to catch various ocean animals in shallow water, and according to Beckley (15) were taken by divers, who would drive small bottom fish out of holes into nets held across an opening.
Small dip nets were used in combination with a decoy fish to catch uhu or parrot fish. Fishing by this method required considerable skill, and a live uhu, caught by a hook, to act as decoy. Kamakau provided a particularly colorful description of this kind of fishing:

The fisherman was most likely a mature man, with bleached eyebrows and eyes obscured by deposits of salt. His head was underwater as he watched closely for fish; his ears were "racks" for kukui nut meat and his mouth would spew forth chewed kukui meat which becalmed the sea so that he could see the bottom. One hand directed the movements of the decoy uhu, and his left hand sculled the paddle to keep the nose of the canoe headed into the wind. The eyes of the fisherman glanced ahead, behind, to that side, to this side, watching the uhu that were being decoyed. (Works 65)

When the decoy fish, held fast to a line, had succeeded in attracting other uhu, it was maneuvered into the dip net and perhaps two or three other uhu would be brought up with it. The process could be continued until the fisherman was satisfied; Kahaulelio (59) said that as many as thirty fish could be caught per day with this method.

Seine nets, bag nets, and combinations of the two seem to have been particularly important types of nets used by Hawaiian fishermen. Seine nets were long (frequently several hundred feet) with stone sinkers and wooden floats. They were used alone or in combination with bag nets to exploit particular areas beyond the reef or where there was no reef, to a depth of at least 90 feet.
Kahaulelio (2-3) described one type of seine/bag net fishing which required many people (including women and children), in part to gather ti leaves to tie to the long pull ropes attached to three seine nets. The nets were taken out by canoes, and with the bottom weighted by stones, lowered into 90 feet of water. The shadows cast by the ti leaves frightened the fish and drove them shoreward. In about 20 feet of water, divers went down to block all holes with leaves and to attach the bag net. With the seine nets now drawn into a circle, the fish were driven into the bag net.

Various descriptions of particular netting techniques, indicating their relationship to certain microhabitats or species of fish, are frequent in the traditional literature (e.g. Kamakau, Works 60-62; Beckley 12-20; Fornander, Fornander Collection 6: 180-186). Gill nets (nets specifically designed to entangle the fish in the net rather than simply to trap them as in a seine net), were probably indigenous but represented a minor technique used only in surge or reef-protected areas (Newman 43-44, 54).

Certain specialized nets and netting techniques deserve mention. One was a seine net 240 feet by 24 feet, and used by ten men to net turtles swimming close to shore. Presumably used off sandy beaches, the turtles were first seen on the surface before the men swam in with the net, and
several turtles could be taken at once (Fornander, Fornander Collection 6: 180).

Another favorite and frequently described technique involved the use of a bag net and a specially scented carved wooden bait stick, *la'au melomelo*. According to Kamakau (Works 63) the wood was taken from a fishing shrine or a heiau or some "famous spot" so that it would be attractive to the fish, and was repeatedly toasted over a fire and rubbed with coconut oil and *kukui* nuts. The sticks themselves were about two feet long, and apparently could be used along with a bag net as long as 60 feet in as much as 120 feet of water. Divers set the bag net, and sometimes helped drive the fish into it, but the work was directed from above by the fisherman holding the bait stick and slowly maneuvering it and the fish into the net. Kahaulelio (44) describes this type of fishing as being done by only two men; Kamakau's description (Works 62-65) indicates that several canoes, many men, and side nets for the bag net could be employed.

An important method of inshore exploitation was that of subsurface angling with hook, line and pole, both from on shore and in canoes. In deeper waters the pole was replaced with the hand line. The Hawaiians did not use any type of reel, and Newman has speculated that, since it would be
difficult to fish when the line exceeded the length of the pole, pole fishing was replaced with hand lines in depths over 15 feet (54).

Materially, angling represents a complex technology all by itself. Poles, when used, were simple lengths of bamboo. Fish hooks, laboriously carved and filed from shell, bone, teeth, ivory, turtle shell and wood, were manufactured in a tremendous variety of shapes and sizes. Carved stone sinkers of different shapes were also necessary, as were stone or coconut shell bait mortars and wooden or stone pestles, since some of the favorite bait recipes had several ingredients ground together. Angling gear also included hook and line containers, usually of gourds with carefully fitted covers and made-to-size net carrying bags (324-354).

The most complex aspect of angling technology involved the hooks. Fishhook styles have been closely analyzed by archaeologists, not only because they are a frequent artifact recovered archaeologically, but because in Hawai'i they are the only artifact where stylistic changes might be utilized to develop a dating method for archaeological sites. Such changes were also analyzed in the hope of establishing prehistoric contact between Hawai'i and other areas of Polynesia (e.g. Emory, Bonk and Sinoto; Sinoto). The most important differences among fishhooks however, are probably those which were functional and related to the habitat being exploited and the particular fish sought, as
well as the actual method used to catch it (Reinman "Fishhook Variability"). Ethnological work on Palau substantiates the assumption that major characteristics of different types of fishhooks are functional rather than stylistic (Johannes, Words of the Lagoon Chapt. 9).

Hawaiian fishhooks are divided into two basic types, simple one-piece hooks and composite or two-piece hooks. Special types of composite hooks included the shark hook and the bonito hook, both of which were primarily for use in the pelagic zone and will be discussed in that section. Even though the actual method of manufacture was quite different for the simple one-piece and two-piece hooks, the major functional division of all hooks would be that between jabbing and rotating types (Buck 324; Newman 62). Figure 9 (above) illustrates the more common types of Hawaiian fishhooks.

Several authors have explored the ecological significance of jabbing vs. rotating fishhooks (Reinman, Fishing, "Fishhook Variability"; Newman; Johannes, Words; Goto). Rotating hooks, which require the fisherman to maintain a steady tension on the line rather than jerking it to "set" the hook, may be an adaptation to coral reefs, since rotating hooks, unlike jabbing hooks, rarely snag on coral bottoms. It has also been suggested that rotating hooks would be more frequently found in use on long deep water hand lines, if the fish being sought were cautious
"nibblers" rather than fish which hit the hook voraciously and frequently swallow it. Rotating hooks are apparently more difficult for the fish to swallow, but are much less likely to let a fish escape once embedded in the body, than is true of jabbing hooks (Goto 45; Newman 65). Although it is probably impossible to reconstruct the exact significance of fishhook variability in Hawai'i all evidence would seem to indicate much of it probably relates to specific and complex considerations of ecology.

Certainly fishhooks and their varied types and sizes enabled Hawaiians to exploit areas of the inshore zone which might otherwise have been neglected, including areas with shoreline cliffs, reef areas inappropriate for netting, and areas so deep that the use of nets, traps, diving etc. were difficult if not impossible. The use of hooks may also have made it possible for Hawaiians to selectively catch quantities of larger fish than could have been the case with the use of nets alone.

The use of fishhooks is the only fishing technique, other than netting, actually mentioned by members of Cook's crew. George Gilbert (midshipman on the Resolution) apparently did not see anyone using nets: "their only method of fishing, that I know of, is with hook and line at which they are very expert, and assiduous" (Gilbert 122). The more observant Samwell (surgeon's mate on the Resolution) mentioned that gourds were used to "keep fish hooks & lines
and various other things." He went on to describe some of
the major fishhook types: "They catch fish with Nets and
Hooks of different sizes made of Mother of pearl, bone &
wood pointed with bone, the latter are of a great size with
which they catch Sharks and other large fish." (Beaglehole
2: 1183-4)

William Ellis, surgeon's mate on the Discovery, also
was impressed by the variety of hooks and observed that
"some of the principal men, who wish perhaps to appear
singular, have them [fishhooks] made of the bones of those
they slay in battle" (Ellis 176). On Kaua'i after Cook's
death, James King stated that the chiefess Kamakahelei "made
me a present of some fish Hooks which she assur'd me were
made of the Bones of Terre'oboo's [Kalaniopu'u] father, who
was killed in a descent he made upon Wou'ahoo [O'ahu] where
his party were routed. They have many of them Human Bones
which they keep as trophies of their prowess & success"
(Beaglehole 1: 577). Kamakau (Works 77) stated that the
bones of "hairless men" were the only ones sought for
fishhooks, though according to Pogue the bones of chiefs,
whether hairless or not, were particularly desirable. This
was one reason why a chief's bones would be hidden, since it
was "considered a disgrace" if the bones were turned into
fishhooks (Pogue 102).
Techniques of the Benthic Zone

In addition to shore fishing, the fishhook made possible the exploitation of the inshore bottom zone in the lower depths where nets were not practical. The benthic zone from 180 feet down to the maximum depth utilized by Hawaiians, 1200 feet, was almost entirely exploited by means of hooks and long hand-held lines.

The lines themselves, of varying thicknesses and braided from olonā, were an item continually sought by the early western traders, for rope was vital on the early sailing ships and frequently needed to be repaired or replaced (Rickman 298). Nathaniel Portlock described the fishing lines as from "three to four hundred fathoms long, and perfectly well made. Some were made with two and others three strands, and much stronger than our lines of twice the size" (59).

Early visitors observed enough bottom fishing with handlines to have great respect for Hawaiian abilities. George Dixon (in Hawai'i with Portlock in 1786) called the people "very dexterous" handline fishermen. He recorded instances where his crew, fishing with Hawaiian lines and European fishhooks, immediately handed the lines over to nearby Hawaiians if a fish of any size was hooked. In one case, the Hawaiian "played the fish with ease, and in a short time got it into his canoe. It proved to be a large
cavallie, [a member of the Carangidae or jackfish family, perhaps a kāhala or an ulua] and weighed one hundred pounds" (276).

In addition to lines with single hooks, the Hawaiians exploited the benthic zone with multiple-hook lines. Kahaulelio, fishing in the mid-19th century, was particularly expert at fishing the benthic zone between Maui and Moloka'i, and described two similar multiple-hook techniques. One was termed kaka, and featured lines some 200 fathoms or 1200 feet long, with forty or fifty hooks per line. The hooks were baited with octopus and were tied on approximately a yard apart. The line was lowered with the aid of a stone tied loosely to the end, which was later jerked free when it hit the bottom. Kakaula (or kukaula) fishing was very similar but featured shorter lines and was used in depths of 50 to 70 fathoms, or up to 420 feet of water. Newman has stated that the hooks used were almost certainly the rotating type, as these would tend to hold the fish firmly after it had hooked itself (Kahaulelio 18-22; Newman 41,47).

Clearly the Hawaiians were aware that benthic fish such as the snappers and jacks were found in layers or zones as described by Stephan Ralston (Figure 7 above). In describing kaka fishing, Fornander noted that "As the line hangs perpendicularly so the hooks hang, a yard from one hook to another, and so on till all the forty hooks are
fastened. These hooks are called kaka, ulaula, koae, lehe, mokuleia. These are the fishes caught on the lower hooks, and on the uppermost hook are the kahala caught" (Fornander Collection 6: 184-86).

While it is difficult to identify all the fish listed, ulaula is probably the 'ula'ula and koae the 'ula'ula koae. These two species are found at the deepest levels, over 600 feet according to Ralston. Lehe may well be the fish called lehi, one of the red snappers found in Ralston's mid-zone; mokuleia is now listed as another name for kāhala, though it may once have represented a slightly different fish (Titcomb, Native Use of Fish 83). Certainly kāhala are fish found in the shallowest areas, usually from 180 to 420 feet. It should be noted that Ralston's research into benthic fish zonation revealed "new" information not previously known to fish biologists.

Benthic fish, which tend to stay in the very specific areas of the bottom, are particularly identified with "fishing grounds" or ko'a. Kahaulelio listed by name one hundred deep sea grounds in the area between Lana'i, Kaho'olawe, and Maui, and provided landmarks for many. He had fished at all but two of these, and stated they were generally one or two miles distance from each other (26-27). Kahaulelio also discussed the nature of the bottom itself, whether flat or "with ... cliffs and mountains that are overgrown with trees that grow in the sea" (30). Fornander
provided the landmarks for a 1200 foot deep fishing station
off the northern shore of the Big Island (Fornander
Collection 6: 186). Clearly a detailed knowledge of the
location of the various benthic fishing grounds was
essential for the exploitation of this zone.

Techniques of the Pelagic Zone

Fishhooks, either with poles or handlines, were also
the primary method of exploitation in the pelagic zone, the
deep water surface and immediate sub-surface of the ocean
extending as far out from land as the fishermen cared to go.
The most noted hook used in this zone was the bonito (aku)
hook, or pā uhi. Consisting of a pearl oyster shell shank
(which acted as the lure), a bone point, and a pig bristle
hackle all elaborately lashed together, the pā uhi was used
in surface trolling (Figure 9 above). Kamakau (Works 74-
75), Kahaulelio (10-11), and Buck (333-37) all provide
descriptions of bonito hook manufacture.

Kahaulelio (11) claimed that human bone was always used
for the bone point before the Hawaiians had access to metal.
The most important aspect of the bonito hook was the pearl
shell lure, and it was the quality and luster of the shell
which made these hooks so valuable. Kahaulelio notes that
"if the hook was so it had colors like a rainbow, the
fisherman would love it as he would his sweetheart.
Wherever he laid his head, there his hook would be laid lest
it be stolen from him." The fisherman who possessed such a
hook also had to have access to not only a canoe but a number of speedy rowers. On calm days "one had to row until he was out of breath. The man who did the trolling found it was all like a game and only his mouth worked as he called 'Row, row, row.' That was all he did until the rowers lost their tempers" (11).

Aku fishing also was practiced using live bait. Kama­kau described this method of fishing, and noted that forty or more canoes would participate at once (Works 71-74). Small fish, particularly the 'iao (silverside), were netted inshore and placed in a specially made canoe-shaped bait box or malau. Each malau was lashed under the platform of a double canoe and provided bait for the six or seven fishermen of that canoe. Aku feeding on small fish at the surface were located by the sea birds hovering above them. When the fishermen arrived, some of the live fish were thrown into the water as "chum" and the fishermen baited their hooks, frequently storing the live bait fish in their mouth so that hooks could be baited easily. Kamakau described the process:

When the fish took the bait and broke water, the fisherman stood up straight and grasped the pole with both hands. The fish came completely out of the water and slapped against the right side of the fisherman's chest, sounding like the dashing of one wave against another ... He ran his right hand along its head and with a quick push with his open palm he freed the hook and shoved the aku forward into the canoe. From the 'iao in his mouth he rebaited his hook and cast again. If he use forty 'iao, he would catch forty aku. (Works 73)
'Ahi and mālolo were also sought with hook and line. Fornander described a method of handline fishing for 'ahi, using 2400 feet of line, large hooks, and aku or 'ōpelu as bait. Approximately 500 feet of line was let down with a stone sinker which was then jerked off. The extra line was needed to fight the fish and bring it in. Fornander also describes the use of a hand line to fish for mālolo, using about 160 feet of line and a hook baited with lobster. This method was one used on windy days, so the line would blow out and float on the surface of the sea (Fornander Collection 6: 184).

Mālolo and a smaller flying fish, the pukikii, were more frequently caught using large fine-meshed bag nets. Many canoes (perhaps as many as forty) were needed to surround the fish once spotted, usually several miles from land. Fornander described the net as being 100 feet long and 36 feet high, with a mouth of about 80 feet (Fornander Collection 6: 184). Once the net was placed in the water, the other canoes drove the fish into it. This method was one of the first specific techniques recorded by westerners. Portlock, sailing off O'ahu in 1786, purchased the largest flying fish he had ever seen (up to twelve inches long), and noted "These fish are caught in nets, which the people here manage with great dexterity" (76).

Sharks were caught primarily in the pelagic zone with large wooden hooks, either single or composite (Figure 6).
An elaborate lashing covered by a woven olonā cover connected the point to the handlines (Buck 339-341). Both Kamakau and Beckley described a type of shark fishing with chum which took place far out in the ocean, often out of sight of land. Kamakau said that decomposed pig or human flesh was used for the chum, while Beckley stated that the livers and flesh of small sharks were used. After chumming the water, perhaps for several days, the large shark niuhi appeared, and was caught not with a hook but with a noose (Kamakau, Works 87; Beckley 11). Thomas Manby, who sailed with Vancouver, was apparently referring to this method of catching shark when he observed that the flesh of humans who were sacrificed was "given to the King's Fishermen to catch Sharks with" (44).

Aquaculture

In addition to the elaborate techniques discussed above to exploit the inshore, benthic, and pelagic zones, the Hawaiians by 1778 utilized almost every standing body of water onshore to store and raise fish. They had also built numerous stone-walled fish traps and fishponds on suitable shore line areas. Archaeologist Brian Kikuchi has studied both the archaeological and ethnohistorical evidence for aquaculture and has devised an elaborate typology for the fishponds and traps, which is summarized in Figure 10.

In many cases, the Hawaiians simply utilized existing pools of salt or fresh water, frequently adding ditches to
connect the pools to rivers or the sea, and building sluice grates (mākāhā) to prevent the escape of fish. In addition, in areas of irrigated taro the taro plots themselves were used as ponds (Kikuchi 228-29).

Loko kuapā were stone or coral walled ponds built into the sea itself and containing one or more sluice grates. The walls might be several thousand feet long, and averaged from three to six feet high and about seven feet wide. The longest wall for a fishpond was 6300 feet, and one pond had walls thirty-five feet thick at the base (Kikuchi 229-230). These stone walled ponds clearly represented enormous expenditures of human energy to build and maintain.

Similar in construction to the walled fishponds and often confused with them were the walled fishtraps, or loko 'ume'iki. The walled traps lacked a sluice grate, but had inward or outward leading lanes and walls usually low enough to be submerged at high tide. Fish were trapped during high tide and could be captured at the mouths of the lanes as the tide receded, or could be caught swimming into the lanes as the tide rose (Kikuchi 230-31).

Although almost any fish could enter the major ponds as spawn or be trapped in the traps, the Hawaiians caught several species as spawn and stocked the ponds with them. The stone walled loko kuapā were primarily stocked with ahole, 'ama'ama or mullet, and awa'aua or milkfish. Also common in ponds were the nehu or anchovy, barracuda, eels,
<table>
<thead>
<tr>
<th>Hawaiian Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loko Kuapā</td>
<td>A fishpond on the shore whose side or sides facing the sea is built of stone or coral, with one or more sluice grates</td>
</tr>
<tr>
<td>Loko Pu'uone</td>
<td>An isolated fishpond near the shore, formed by the development of barrier beaches (usually a single long sand ridge parallel to the shore); usually contains one or more ditches and sluice grates</td>
</tr>
<tr>
<td>Loko Wai</td>
<td>An inland fresh water fishpond, usually either a natural lake or swamp; often connected to the sea by a ditch with a sluice grate</td>
</tr>
<tr>
<td>Loko i'a kalo</td>
<td>A fishpond which utilizes irrigated taro fields as ponds</td>
</tr>
<tr>
<td>Loko 'ume'iki</td>
<td>A fishtrap built on the shore, with walls of stone or coral, with inward and/or outward leading lanes</td>
</tr>
</tbody>
</table>

Source: Kikuchi (227-230).

Figure 10. Fishpond Types

and the goby fish called 'o'opu. Most of these same species could be found in the taro and other fresh or brackish water ponds, particularly ahole, mullet and 'o'opu. Turtles were also kept in fishponds, and the stone walled ponds and traps also provided a suitable habitat for certain shellfish like the pipipi and 'opihi (Kikuchi 94-95).

The fish in ponds and traps were most frequently caught with a scoop net, often at the mouth of the sluice grate or lane as the fish gathered there during the incoming tide.
They were also netted with larger nets, speared, or simply gathered by hand (Kamakau, *Works* 49-50; Beckley 20-21).

The knowledge of the ocean ecosystem demonstrated by the various techniques recorded is enormous, and almost certainly encompassed information yet undiscovered by modern marine biologists. Yet a total understanding of the Hawaiian *system* of maritime exploitation depends upon the social relations of production as well as on knowledge and techniques. It is valid to view Hawaiian fishing techniques as a finely-tuned adaptation to a specific environment, but the social relations of maritime production were also adaptive, both to the specific environment and to the specific technology. Because of this close relationship, any alteration of the social relations of production would ultimately effect technology, techniques, knowledge and environment.

**SOCIAL RELATIONS OF PRODUCTION**

The social relations of production are part of a culture's infrastructure, using Godelier's definition (763). In Hawai'i the interrelated institutions of kinship and religion functioned in part to control access to basic resources, to allocate and organize labor, and to determine the social form of redistribution. In that sense, Hawaiian culture was an example of a society with a kinship mode of production. Yet just as Hawai'i could be viewed politically
as an incipient state, in terms of the social relations of production it verged on a tributary mode.

Eric Wolf described two kinds of chiefdom, and in 1778 Hawai'i clearly resembled the second type. In the first type, the chief and his followers are "still embedded in kinship arrangements and bound by them...." In the second type, "the form and idiom of kinship may be maintained" even as the chiefs use kinship mechanisms to transform status divisions into those of class. "In this second kind of chiefdom, the chiefly lineage is in fact an incipient class of surplus takers in the the tributary mode" (97).

Hawaiian chiefs were still dependent on the "form and idiom of kinship" and the interrelated religious beliefs for any seizure or transfer of "surplus production." They had not succeeded in developing any other mechanism (such as the purely political power of the state) to mobilize social labor. Hence the cycle of warfare and rebellion so prevalent in Hawaiian traditional history. Support for this view of precontact Hawai'i can be gained by an examination of the social relations of production as they existed in relationship to marine resources. Each of the three aspects of social relations will be considered separately: access to resources (control of the means of production), allocation of labor among labor processes and their organization, and the social form of redistribution.
Access to Resources

Access to maritime resources was controlled and restricted by several interrelated concepts. One was the ahupua'a system, a type of land division with social, political, religious, and economic aspects. Another means was an elaborate system of religious tabus concerning maritime resources. Access to the ocean was also restricted by limiting the distribution of essential equipment and essential knowledge. In a sense all of these methods of controlling access to the ocean were adaptive; they functioned to conserve the ocean resources and to prevent environmental depletion. This does not mean that Hawaiians consciously developed all these methods of limiting access with a view to conserving the marine environment. Yet in an environment such as Hawai'i, where marine resources were a vital source of protein, and where both the inshore and benthic zones were extremely narrow and relatively sparse, such cultural practices may have survived because of their real adaptive value.

The most significant land division in Hawai'i at contact was the ahupua'a. This was ideally a wedge-shaped strip of land from the mountain top to the sea, with the side boundaries formed by the ridges between valleys. An early land surveyor, Curtis Lyons, wrote that
The central idea of the Hawaiian division of land was emphatically central, or rather radial. Hawaiian life vibrated from uka, mountain, whence came wood, kapa, for clothing, olona, for fishline, ti-leaf for wrapping paper, ie for ratan lashing, wild birds for food, to the kai, sea, whence came ia, fish, and all connected therewith. Mauka and makai are therefore fundamental ideas to the native of an island. (104)

Marion Kelly has stressed that the ahupua'a ideally were economically self-sufficient units. Each ahupua'a "guaranteed the tenants a degree of economic independence, their needs being supplied by forest land, taro and sweet potato areas, and fishing grounds" (Changes in Land Tenure 20). The ocean reef and probably the entire inshore area, and quite possibly the benthic and even major portions of the pelagic zone, were considered as extensions of individual ahupua'a.

Ahupua'a were grouped into districts, and subdivided into a variety of smaller units. The most important of the subdivisions were the ili kupono, units which technically were within an ahupua'a but politically and economically independent. Within each ahupua'a were land areas termed koele, which were cultivated exclusively for the use of the chief of the ahupua'a (W.D. Alexander, Brief History 4-6).

Ahupua'a were not equal in size, for some were as large as 100,000 acres while others contained only 100 acres. Larger ahupua'a often tended to incorporate for themselves major upland areas, particularly on the larger islands. These large ahupua'a also had the more extensive fisheries.
"While the smaller ahupua'as had to content themselves with the immediate shore fishery extending out not further than a man could touch bottom with his toes, the larger ones swept around outside of these, taking to themselves the main fisheries..." (Lyons 111).

Larger ahupua'a may well have possessed the fishery rights not only to inshore areas deeper than five or six feet, but also to much of the benthic and even pelagic zones. There are traditional accounts where particular benthic fishing grounds are spoken of as being "owned" by specific chiefs, probably chiefs of an ahupua'a or district, and kept secret by the chief's head fisherman ("The Story of Hema" n.p.). In Palau, where much more of the traditional ocean tenure system was preserved into historic times, Johannes noted that district fishing rights extended out to a distance where the islands were barely visible, or about twenty miles (Words of the Lagoon 352). This distance also represented the practical limits of pelagic fishing in Hawai'i, and quite possibly pelagic fishing rights were associated with specific ahupua'a or districts at contact.

Hommon has postulated that economic and political control of interisland channels (particularly the valuable benthic fishing area between Maui and the smaller islands nearby) was an important perogative of district and paramount chiefs (Use and Control). If district boundaries extended out into benthic and pelagic fishing zones, fishing
rights would clearly serve as a source of hostility between district chiefs. As will be discussed later, there is evidence that this was the case. In the 1839 Constitution, Kamehameha III took all the fishing grounds "from those who now possess them" and gave those fishing grounds "without the coral reef ... together with the ocean beyond" to all the people (Thurston 21). Presumably this act was necessary since traditionally access to benthic and pelagic grounds was restricted.

Certainly rights to use the resources of an ahupua'a, including its fisheries, were limited to the tenants of the ahupua'a. In addition, actual use was controlled by the local chief, the ali'i-'ai-ahupua'a. In all probability, in early Hawaiian prehistory such local chiefs were descendants of elder kinship lines (first born of first born) and were genealogically related to the younger kinship lines of the rest of the people in the ahupua'a. Sometime before contact this changed, and the ali'i in charge of each ahupua'a was appointed by the paramount chief from among his own close relatives. The paramount chief was the head of a chiefdom, which at contact often consisted of an entire island or moku. According to Malo genealogies were of significance only for the ali'i, and the commoners, or maka'ainana, were essentially people who did not remember their genealogies (Hawaiian Antiquities 60). Yet in all respects, the ali'i-'ai-ahupua'a, as well as the higher ali'i-'ai-moku, were
expected to act like elder kinsmen even if there was no longer any actual genealogical tie (Kirch, *Evolution* 258).

All products of an ahupua'a, including its maritime resources, "belonged" to the chiefs. Chiefs had the right to seize anything produced by the people, and also could expel individuals from their ahupua'a. Maka'āinana were essentially tenants at will, since while they utilized the resources of the ahupua'a at the will of the chief, they also were able to leave an ahupua'a and live elsewhere if the chief was considered too exploitative. In addition, chiefs who were viewed as violating the kinship obligation to care for the people could be overthrown and killed (Malo, *Hawaiian Antiquities* 195).

As noted, utilization of the marine resources of an ahupua'a was essentially restricted to residents of that ahupua'a. In addition, either the ahupua'a, district, or paramount chief could restrict fishing by imposing tabus on particular fish, on all fishing, or on fishing that required canoes by forbidding canoe travel. Keliipio noted that all "shallow water" fish were tabued at different times, and at other times only specific fish species would be tabued by ali'i and konohiki (a chief's agent in charge of an ahupua'a). Hau tree branches would be placed along the shore to indicate a periodic tabu, apparently to conserve the inshore fish, and the people would resort to deep water fishing. Keliipio recorded that deep water fishing was also
tabued from time to time, although he ascribes these tabus as originating with the fishing god Ku-'ula (110-114).

Kamakau noted that octopus in particular were frequently tabu at different times in different areas. In some cases the tabu lasted for two months but at other times might last as long as six months. During this time, all methods of taking octopus were forbidden, and hau branches were set up along the beaches to indicate the tabu. From Kamakau's description it seems clear that the duration of the tabu depended upon how quickly the octopus population replenished itself, since the konohiki made frequent inspections to determine the quantity available. Ultimately the tabu would be lifted, and everyone hunted octopus both from shore and in canoes (Works 70).

Kamakau also described in more detail the restrictions placed by Kamehameha I on inshore (shallow water) fishing, and may be describing the powers of a paramount chief at contact. All fishing was tabued for five months, and then permitted for the next six months. However, "at the end of this period restrictions were again placed over certain fish in order that they might increase." Kamakau recorded that such tabus were sometimes extended to the deep sea (benthic) fishing grounds where kāhala were caught, and to fish like the pelagic aku and flying fish (Ruling Chiefs 177).

Local konohiki as well as district and paramount chiefs were thus apparently obligated to control fishing in order
to maintain the fish populations. Undoubtedly some species, particularly shellfish, whose population could be rather easily depleted, were more frequently tabued. If a food shortage existed due to drought or any other cause, the chiefs may have lifted any tabus and permitted overfishing (Pi'iania, qtd. in Currey 453).

Access to one particular resource, whales, was specifically limited to paramount chiefs. Whales were not hunted but did occasionally drift onto shore. Malo noted that such animals (along with any log that contained iron) were given to the priests "for the use of the king" (Hawaiian Antiquities 189). Kamakau recorded an incident in the 1770s when Kahekili (paramount of Maui) attempted to gain control of O'ahu by requesting the rights to ivory from that island. O'ahu's paramount, Kahahana, was warned not to permit this, since it would be tantamount to handing over the rule of O'ahu (Ruling Chiefs 129).

In addition, chiefs in charge of an ahupua'a, a district, or an entire island could forbid all travel by canoe for certain periods of time, a practice which tended to irritate early visitors. In late January of 1779 King wrote that

No canoes were suffered to come on board the Ships & the Natives kept close to their houses; We could only learn, that any intercourse with us was Tabooed, because of Teereeoboo's [Kalaniopu`u] coming ... As he did not come today, & on board the Ships they were in want of Vegetables, on the 25th in the morning Canoes were encourag'd to come
along side but on some venturing a Chief in attempting to drive them away, had a musquet fird [sic] over his head to make him desist which he did. (Beaglehole 1: 511)

Any such tabu on canoe travel limited fishing access not only to benthic and pelagic zones but to the deeper inshore areas.

Actual marine resources, and hence almost certainly the type and length of tabus, varied considerably from one ahupua'a to another. Not only would larger ahupua'a control most of the inshore fishing in water over five feet deep, but as noted above quite possibly attached benthic and even pelagic zones as well. In addition, it is important to note that fisheries were not equally distributed throughout the islands. Areas of fringing reef were quite limited in the islands, the nature of the shoreline determined which marine species were actually available, and in many areas the inshore and benthic zones were extremely limited because of the abrupt sloping of the ocean bottom (Figure 5). The distribution of such varying resources to different ahupua'a almost certainly strengthened the use of tabus to preserve resources, since fishermen who hleted their own ahupua'a fisheries could not easily go anywhere else to fish.

Access to resources from fishponds and the large stone fishtraps was also determined by ahupua'a residency. Kikuchi has noted that the Hawaiians built fishponds and
traps in areas which were geographically suitable, and that
the particular characteristics of the seashore were what
determined their distribution (25). The large stone 'loko
kuapā fishponds and 'ume'iki fishtraps were limited to areas
which were protected by fringing reefs (37). Fishponds and
traps were always found within ahupua'a boundaries, and
access to them was hence restricted to tenants of that
ahupua'a (98). Kikuchi lists approximately 360 fishponds,
most of which were in existence at contact. At the same
time, there were probably 1,211 ahupua'a and 'ili kūpono (W.
D. Alexander, Hawaiian Geographic Names). As Hommon has
noted, this means that fewer than 30 percent of the ahupua'a
contained any fishponds or traps, since some had more than
one (Use and Control 115).

Many of the methods of limiting access discussed above
were related to the authority of the chief and were
supported by the religious belief that the ali'i were elder
kinsmen and genealogically more closely related to the gods.
In addition, there were specifically religious beliefs and
tabus which certainly functioned to restrict access and
hence conserve the fishing grounds. The most important of
these were the alternating six month tabus on aku and
'ōpelu.

Aku (skipjack tuna) and 'ōpelu (mackerel scad) were
pelagic fish that had a special place in traditional
history, since they accompanied the legendary priest Pa'ao
in his voyage from Tahiti to Hawai'i sometime in the eleventh century. Pa'ao's older brother sent a storm to wreck the canoe, but Pa'ao invoked Lono and "first a school of aku fish, then one of opelu [came] to quiet the waves" (Beckwith, Hawaiian Mythology 371). The two schools of fish accompanied the canoe all the way from Tahiti to Hawai'i, and "when the wind kicked up a sea, the aku would frisk and the opelu would assemble together, as a result of which the ocean would entirely calm down ... On this account the opelu and the aku were subject to a tabu in ancient times" (Malo, Hawaiian Antiquities 6-7).

Aku at least may well have accompanied early voyagers to Hawai'i. Jean La Perouse, trading off Maui in 1786, noted that a large school of bonito (aku) followed his ships from Easter Island. The school was seen daily, and some of the fish were recognizable from particular scars left by the harpoons of the sailors. The aku school deserted the ships in Hawaiian waters (353).

Aku could not be caught from July to January, and the tabu on 'Opelu was from January to July, according to Malo (Hawaiian Antiquities 209). George Vancouver, on his second and third visits in 1793 and 1794, indicates that the tabu on aku was lifted in the middle of February. The ceremony lifting the aku tabu formed part of the variety of activities of the Makahiki period. In Malo's description of the Makahiki he notes that around mid-January "Kahoalii [a
man impersonating a god] plucked out and ate an eye from the aku fish together with an eye from the body of the man who had been sacrificed. After this the tabu was removed from the aku and it might be eaten; then the opelu in turn, became tabu, and was eaten only on pain of death" (Hawaiian Antiquities 152).

From accounts provided by Vancouver and his men, the ceremony also involved a ten day tabu, during which only certain fishermen of the paramount chief were permitted to fish, and only ali'i and priests could eat the fish.

Vancouver's ships anchored in Kealakekua Bay on Feb. 13, 1793. They discovered a rigid tabu was on all over the island "in consequence of the season having commenced for the taking of these fish...[bonito]" (Vancouver 2: 168). The English were told that the tabu had started Feb. 7 and would last until the 17th, or a total of ten days. During that time, all travel by canoe was prohibited except for fishing authorized by ali'i.

During these Taboos no Canoes whatever (except some particular Fishing Canoes of the King's) can stir from the Beach ... So wonderfully strict, and so religiously tenacious are the Priests in the exaction of these Taboos, that a breach in the observance of them is punished with death--and a poor man had yesterday met this melancholy fate, for going clandestinely on the Water to Catch fish (not being of the privileg'd fishermen) at the request of his wife for her supper. The Taboo on the men was to be out Tomorrow morning at Sunrise, but that on the Women [forbidding canoe travel and presumably eating fish] was to continue a day longer. (Bell 62)
In June/July another ceremony, which also involved a ten day tabu on fishing, celebrated the lifting of the tabu on 'ōpelu and the imposition of the tabu on aku. As part of the ceremony, fishermen gathered for religious service at a shrine dedicated to Ku-'ula, the fishing deity, and perhaps specifically reserved for 'ōpelu. All noise was prohibited throughout the night: "...also the crowing of the rooster, the grunting of the pigs, and the barking of the dogs. It was a most sacred night." On the following day pigs, coconuts, and banana were given as offerings to the fish deity and the people feasted throughout the day. At night 'ōpelu fishermen went out for fish, but everyone else was forbidden to travel by canoe.

This was a most sacred day, no fire being lighted here or there, no other canoes being seen on the ocean, this day, lest they perish. When the fisherman reached the fishing grounds and lowered his net he prayed to his ancestral deities.... He then cast the net and threw out the bait. The 'ōpelu, on devouring the bait, came streaming into the net...When they [the fishermen] landed, the priest came.... The fisherman took up seven 'ōpelu, walked up to the priest and placed them in the priests' hand. The priest then took the 'ōpelu to an uhe board (board for offerings) where the fish was consecrated to the deities. (Fornander, Fornander Collection 6: 30-32)

To end the ceremony, the priest delegated a man to take some 'ōpelu to the "king." The king took some of the 'ōpelu to a shrine and ceremoniously ate the right eye of the fish. At least one more night of ceremonial fishing took place, the canoes came back in, and for nine days were forbidden to
go out again. After that, 'ōpelu could be taken freely and aku were forbidden (Fornander, Fornander Collection 6: 34; also Malo, Hawaiian Antiquities 209-210).

From available descriptions of the aku/'ōpelu tabu ceremonies, it is evident that these are religious ceremonies designed to insure that the dieties maintain a steady supply of fish. Thomas Manby observed the lifting of the aku tabu in 1793, and described it as "an Invocation to the God that presides over fish: ... as a notion prevails, was this ceremony neglected, the finny tribe would immediately quit the shores of Owhyee" (39). While the rational for the tabu may well have been strictly religious, it is unlikely the practice would have survived unless the fish involved had major economic value and the tabus helped to maintain the numbers and the size of the fish.

'ōpelu, shallow-water (less than 600 feet) pelagic fish, were tabued from January to July, and hence were protected throughout almost their entire spawning period of mid-March to mid-August. Unlike many fish, 'ōpelu spawn only once during their spawning season, and hence might be particularly open to depletion if taken during that time (Gosline and Brock 172). Aku spawn at almost the same time as 'ōpelu, from March to September, and hence were not protected during most of their spawning period (Gosline and Brock 258). However, since aku spawn several times during their season and live up to three years, the six months
annual protection may have functioned to insure that larger fish could be taken.

In addition to the major aku/'ōpelu cycle, fishing was restricted (and hence access was limited) on a regular basis as part of the monthly and annual religious cycles which existed in Hawaiian culture. In each month there were four tabu periods "devoted to religious ceremonies and the worship of the gods" (Malo, Hawaiian Antiquities 32) These tabus were normally imposed in the evening and lifted on a morning two or three nights later; in each month, there were nine tabu days. It is not clear if all fishing was forbidden during the tabu periods, but canoe travel and hence canoe-based fishing were prohibited. The monthly tabus were in effect for eight months (or a total of 72 days each year), when the normal religious cycle was suspended for the Makahiki.

During the Makahiki additional tabus, many affecting fishing, were periodically imposed. Malo described the Makahiki as "a time when men, women and chiefs rested and abstained from all work, either on the farm or elsewhere. It was a time of entire freedom from labor." This does not appear to be true for the entire four month span of the Makahiki, but was at least true of the first four days. After that, Malo noted that "every man went to his farm, or to his fishing..." (Hawaiian Antiquities 141). At least in the time of Kamehameha, a major purpose of the Makahiki was
to collect "taxes" which were viewed as offerings to the
gods. It was also the time of ascendancy of the god Lono.

As part of the Makahiki, images of Lono were made, one
of which, the akua loa, consisted of a small carved image
placed atop a pole about 12 feet high. The pole also had a
cross piece from which hung a square piece of white kapa,
the whole looking somewhat like the square-rigged sails of
Cook's ships. (Hence, according to Malo, Cook's
identification with the god Lono [Malo, Hawaiian Antiquities
145]; see Sahlins, Historical Metaphors for an extended
discussion of Cook and Lono.)

The akua loa was carried in a circuit of the island,
moving in a clockwise direction keeping the ocean to the
left. While the image was in a district, the land to the
left of its path (i.e., the fishery) was tabued. At each
ahupua'a boundary the procession collected the tax or
offering that had been assigned to that land unit, and
continued on (Malo, Hawaiian Antiquities 143-148). In all
probability the Makahiki did not involve an island-wide
circuit during periods when the island was not united under
one ruler, and Kamakau states that the practice was actually
initiated under Kamehameha (Ka Po'e Kahiko 20). An
additional four day tabu on fishing, apparently in December,
was also described by Malo, coinciding with the return of
the image from its circuit of the island (Hawaiian
Antiquites 150).
Canoe-based fishing was thus prohibited each year for seventy-two days as part of the monthly religious cycle, for twenty days as part of the ceremonies involving the aku/'ōpelu cycle, and for at least eight days plus the time the akua loa was in the district during the Makahiki. As already indicated, all fishing or canoe travel could be prohibited at any time by ahupua'a or district ali'i, and particular species of fish could be protected for indefinite periods of time. Regardless of the conscious purpose for these tabus in the minds of Hawaiians, they clearly functioned to limit access to marine resources and hence conserve them.

Food tabus, again religiously sanctioned, also limited access to particular individuals and to women as a group. Many foods were tabued for women, generally those which were considered as suitable offerings for the dieties. Major items which were prohibited to women included pork, bananas, and coconuts, which were the most important ceremonial offerings. Several fish species were also utilized for that purpose, and in consequence it was tabu for women to eat ulua (jackfish) or kūmū (one of the goatfish), red fish generally, the niuhi shark, and sea turtles. These food tabus originated at the same time as the tabu that prevented men and women from eating together, and the overt function of these tabus "was to separate from the worship of the god
those who were unclean and defiled by blood [menstruation]; and so all those who were polluted were kept separated because the god desired only those who were clean and pure" (Kamakau, Ka Po'e Kahiko 64; also Malo, Hawaiian Antiquitates 29). Such food tabus may also have helped prevent over-exploitation of certain marine food items which were relatively scarce and highly desirable.

Other food tabus existed which affected specific individuals. Pregnant women were forbidden to eat anaehole [a term for large 'ama'ama or mullet], as were children too small to pick out the bones (Keliihipio 113). Most other individual tabus centered on the concept of 'aumakua. 'Aumakua were personal or family gods, defined by one anthropologist as "animal helpers, half god, half human, who utter their counsels through the lips of some medium, who becomes for the moment possessed with their spirit.... They are bound by obedience to their devotee, who becomes their keeper, and their worship, and consequent service, extends to his family and is handed down from generation to generation" (Beckwith, "Hawaiian Shark Aumakua" 503).

Different shark species were frequently 'aumakua for specific families, and other sea 'aumakua included octopus, squid, and shells like the cowrie and limpet (Beckwith, "Hawaiian Shark Aumakua" 506). Families with shark 'aumakua were forbidden to eat shark of any kind, plus other types of fish; most food tabus associated with the possession of any
'aumakua included at least some species of fish or shellfish (Kamakau, *Ka Po'e Kahiko* 89). Such food tabus did function to restrict access to particular resources, and may have helped to conserve such resources.

In certain respects, access to marine resources was restricted because access to the necessary tools and knowledge was restricted. Canoes, large fishnets and long lines, pearl hooks, and the appropriate knowledge to exploit certain zones, was not necessarily available to all Hawaiians. This was primarily due to the way labor was allocated and organized.

**Labor Organization and Allocation**

Lieutenant King described the division of labor in 1778 as follows:

> Their Labours are as far as we saw, properly divided, to the Women falls the care of Manufacturing their Cloth, making ornamental dresses, &c, To the men the more laborious parts of Cultivating the land, building their houses & Canoes, making their War instruments, & whatever related to Wood works. In none of these Islands have they yet arriv'd at that pitch of refinement in their Arts, to divide their Labour, the sam[e] man is taught to make a boat, a house, Nets &c. (Beaglehole 1:625)

King's assessment was probably correct, but also incomplete, and reflected a certain confusion caused by the way labor was allocated and organized. From all evidence there were many full-time occupational specialists, both in certain crafts (canoe-making most particularly) and in other areas such as religion, healing, and at least certain types
of fishing. Most of these specialists were associated with particular chiefs, who provided them with food, clothing, and tools. Yet much of the labor was collective, in the sense that any man could be called upon through ties of actual or fictive kinship (by konohiki's or higher ali'i) to assist with any task, including canoe manufacture and benthic or pelagic fishing. At the same time, much inshore fishing was done by everyone, once again frequently collectively.

Fishing was one of the crafts traditionally "separated" at the time of the legendary 16th century paramount 'Umi-a-Liloa. Fornander states that 'Umi

Set the laborers in order and separated those who held positions in the government. He separated the cultivators, and the fishermen, and the canoe hewers. He set apart the warriors, the spear-warders, and every department with proficiency, and every laborer in their respective lines of work. (Fornander Collection 4: 228)

Malo also states that "The people were divided into farmers, fishermen, housebuilders, canoe-makers.... They were called by many different appellations according to the trades they followed" (Hawaiian Antiquities 61). Fishermen, "those skilled in the art of catching fish, were called poe lawaia" (208).

Kamakau spoke of the fishing profession as one that could not be undertaken without canoes, nets and fishing lines, indicating that although anyone could fish in the shallow inshore zone, the deeper inshore zone and the
benthic and pelagic zones were reserved for those who had both the knowledge and the resources to exploit them (Works 59).

If a fisherman were a landholder or a chief, or a descendant of a fisherman, or a son in a family which had 'aumakua of fishing, then he could be a true fisherman with no lack of long canoes, short canoes, light, swift canoes, large and small nets, and long and short fishing lines. He would have everything he needed, and nothing would stop him. (Kamakau, Works 59)

Fishing specialists, or head fishermen, are frequently mentioned as being in charge of particular kinds of fishing involving several nets and/or canoes. The ali'i in charge of an ahupua'a or larger land unit helped support a "head fisherman" and kept him supplied with canoes, nets, long handlines, and other necessary tools. The ali'i could also allocate the labor necessary for types of fishing that required many people. The expert fishermen also discovered, and retained in their family lines, the knowledge of certain benthic fishing grounds which were kept a secret from others. In addition the fishing experts retained the large body of knowledge necessary to successfully exploit the pelagic areas, which required "experts who knew where the schools of fish generally ran" (Kamakau, Ruling Chiefs 239).

Traditionally, the institution of head fisherman, and the "creation" or discovery of the fishing grounds, was established by 'Ai'ai, the son of Ku-'ula, both gods of fishermen. In one version of this story, Ku-'ula and his
wife Hina-puku-i'a were living on Maui when a Maui paramount attempted to destroy them. They escaped into the sea and took with them all edible marine life, including the seaweed. 'Ai'ai remained and eventually established the first fishing shrine, ko'a ku'ula, and taught people the appropriate rituals so that Ku-'ula would permit the fish to return. The rituals included the sacrifice of the first fish caught to the fishing god. Subsequently 'Ai'ai travelled all around the islands, discovering the different fishing grounds in the sea (ko'a) and naming them. He also taught people how to make various kinds of fish nets and lines for the specific types of fish, and set up head fishermen to whom he gave knowledge of fishing (Moke Manu, "Ku-ula" and "Aiai").

Another tradition emphasizes the necessity for a fishing expert to be supported by a konohiki or other ali'i in order to have access to enough nets, canoes, and people. Shortly before Kamehameha I conquered O'ahu, an "ungodly" man who lived in Nanakuli was visited at night by a stone image of the god Ku-ula. The next day the man found the image, which told him where to go fishing. However, since he owned no nets or canoes, the man approached his konohiki who upon hearing the story provided the necessary equipment. The man became a successful fisherman, and "a great favorite of the konohiki's and received property, fish nets, canoe and land, such wealth as he [had] never seen before. The
konohiki continued caring for him and they shared their wealth together for a long time" (Kalakaua n.p.).

Chiefly patronage was necessary for two reasons. First, other craftsmen necessary for certain types of fishing were also supported by the ali'i. Secondly, the unequal distribution of necessary resources between ahupua'a and districts necessitated patronage once individuals were limited to the resources of their own ahupua'a.

Canoes were necessary for many types of fishing, and canoe-makers were another of the occupational specialists primarily supported by ali'i. William Ellis, surgeon on one of Cook's ships, observed canoe manufacture and commented upon how laborious it was, as well as stating that some people practiced it as an occupation (177-178). Kamakau described canoe making as "an important profession for which one had to first be trained and become an expert before he could engage in the work or go to the mountains to hew a canoe" (Works 119). The original shaping of a canoe hull in the mountains, the process of hauling the canoe down to the shore, and the eventual finishing, were all under the direction of an expert.

Mary Kawena Pukui, in her translation of an early undated manuscript by a Lahainaluna student, states that there were both "royal experts" and "common experts," the former belonging to "the supreme ruler ... the ruling chiefs, the district chiefs ... the chiefs of the ahupua'a
This may indicate that although most experts were employed and supported by the ali'i, some experts were not, and were therefore available to a commoner who wanted a small canoe. As Pukui's translation makes clear, there were actually a variety of experts who would assist in the manufacture of an ali'i canoe: "In hewing, the experts who did the cutting were different (men), the adz grinders were different, and different ones attached them to the handles." When the canoe was ready to be hauled down to the seashore, a "proclamation" went out to all the people and the canoe was brought down the mountain (31-35).

Hence even for a chiefly canoe, many of the commoners would assist in different phases of the work. Malo (Hawaiian Antiquities 77) states that the canoes were used by chiefs "as a means of ostentation and display," but clearly the practical value of a large number of canoes to a chief came from their potential as a fishing fleet (as well as being useful in warfare). Hommon estimated that in 1778 the total size of the fishing fleet was between 1500 to 2000 canoes, which would have provided a ratio of canoes to population of about 1:45 to 1:60. As Hommon states, this is probably a conservative estimate (Use and Control 155).

This fishing fleet consisted of both double and single canoes. Ellis recorded during Cook's visit that canoes varied greatly in size (being of course primarily determined by the size of the tree used), and states that they ranged
in length from twelve to over sixty feet. The double canoe used by Kalaniopu'u was seventy-two feet long (177-178). Although many single canoes may well have been the property of commoners, built with expert assistance, the large double canoes were clearly the property of ali'i. They were also just as clearly part of the fishing fleet when they were not being used for war.

In addition to canoes, chiefs were expected to supply fishing lines and nets to their fishermen. Most lines and nets were manufactured out of the Hawaiian endemic, olonā. Kamakau noted that olonā was highly prized, and that it was cultivated (Works 44). According to Funk, olonā may not have been cultivated until European and American ships, with their constant need for cordage, increased demand. Regardless, both agree that the plant itself grew only in certain areas where rainfall was plentiful and the soils deep, primarily on the windward side of the islands. Since the most significant fishing grounds were normally on the leeward sides, olonā represented another item where the patronage of a chief could be important for the fisherman in obtaining necessary equipment. In post contact times olonā fiber and manufactured nets and lines were common items given to the paramount chief during the Makahiki, and this was probably true prior to contact.

As in other crafts, processing the olonā fibers and the manufacture of nets and lines required skill and not every-
one was able to do it (Kamakau, Works 45). Those individuals who were most skilled usually gained the support of chiefs. Kamakau states there was a "kapu lineage of the net makers ... inherited from the ancestors," and that the actual net makers were usually women. A fine-meshed net might take as much as a year to make, and unless the netmaker worked for a chief, sufficient olonā cordage was difficult to obtain (Kamakau, Works 117-118).

As already indicated, chiefs were often the only individuals who could command a sufficiently large labor force for certain types of fishing and for the construction of the large stone-walled fishponds and traps. Beckley, writing in the later half of the 19th century, describes two types of fishing as "fishing of kings," since only a paramount chief could organize the necessary labor. Both appear to be traditional precontact methods. The first method involved large nets, at least one large double canoe, and about 60-100 single canoes, plus many people both in the canoes and on shore. In this method, fish were driven into a large bag net initially lowered out at sea, but held on shore by long ropes to which ti leaves were attached to keep the fish in. The second method involved catching the large niuhi shark, when large numbers of canoes sailed many miles out to sea, perhaps for several days (11-20).

Konohiki tended to organize labor for fishing even for activities which did not necessarily require large numbers
of people or canoes, nets, and lines. The collective shallow water octopus hunt already described is one example (Kamakau, Works 70). Kamakau also described a "district fish poisoning day" when everyone from Waialua to Mokuleia, O'ahu gathered to fish the inshore area by using fish poison (Ka Po'e Kahiko 127). Such indications that even inshore fishing was organized by ali'i are additional evidence that the supply of fish was carefully regulated and probably maintained by the chiefs.

The construction of the stone-walled fishponds and traps (the loko kuapā and loko 'ume'iki) required large numbers of individuals and was organized by an ali'i. As Kikuchi has noted, neither pulleys, rollers, or sleds were used to transport the heavy rocks; all work was done using digging sticks, litters, ropes, and human labor (49). Many fishponds were constructed so early that the Menehune, mythical little people, were said to be responsible. In other instances however, particular ali'i were credited with the construction.

Actual accounts of construction state that rocks were passed from hand to hand by long lines of men, and that larger stones were carried on litters. For those ponds and traps where rock volume could still be computed at the time of Kikuchi's research, the average volume was 49,132 cubic feet, with a high of well over 170,000 cubic feet (57). Kamakau seems to think that a large fishpond or trap took
over 10,000 men to build. Kamehameha I supposedly used this number of men (and women) to repair two Maui fishponds, a task which took several months (Works 47). Regardless of the exact number of laborers and time involved, Kamakau is probably correct when he states "one can see that they were built as 'government' projects by chiefs ... for it was a very big task to build one, and commoners could not have done it" (48).

In summary, ali'i utilized the kinship form, as elder kinsmen and close descendants of the gods, to organize and allocate certain labor resources. Only ali'i could mobilize the labor force necessary for building large fishponds and traps, for building the large fishing canoes, and for certain types of fishing techniques. The ali'i, by the patronage of craftsmen and fishing experts, insured that these individuals would have access to necessary resources and that necessary knowledge would be taught to the next generation. Ali'i activities did help to increase the available supply of fish through a system of redistribution, the third part of the social relations of production.

Redistribution

The manner in which marine foods and related products were redistributed is critical to understanding the Hawaiian maritime system. By traditionally ascribing the ownership of all resources to the ali'i, the system permitted the chiefs not only to regulate and control maritime resources,
but also to arrange for redistribution of resources which were not equally distributed nor equally accessible for all people. To what extent the Hawaiian ali'ī functioned as redistributive chiefs is far from clear, but there is evidence that this was a significant activity, at least with regard to maritime resources.

There exists a strong tradition of generous chiefs who fed the people. The prevalence of this tradition is interesting, since Hawaiian accounts in the area of social relations generally are very much influenced by the missionary view of the chief-commoner relationships. There are many negative references to the "oppression" of the commoners by the chiefs (e.g. Malo, Hawaiian Antiquites 60). Yet at the same time, what was probably the traditional view of ali'ī by commoners comes through clearly: the people loved their generous chiefs, for "the people lived off the chiefs ... the chiefs fed the people" (Pogue 109).

Most of the chiefs that traditionally gained the reputation of being good (in the sense that they fulfilled the obligation of elder kinsmen to feed the people and to act as intermediaries with the gods) were famous for their fishing activities, particularly for pelagic fish such as 'ahi and aku. One of the earliest of these was 'Umi-a-Liloa, renowned for being a chief who gave "food to people" (Kamakau, Ruling Chiefs 12). 'Umi frequently used his canoes to personally engage in fishing, and was called
Pu'ipu'i aka lawai'a, or a stalwart fisherman. "Aku fishing was his favorite occupation, and it often took him to the beaches from Kalahuipua'a to Makaula [on Hawai'i's leeward coast]. He also fished for 'ahi and for kala. He was accompanied by famed fishermen ... and all the chiefs of his kingdom" (Kamakau, Ruling Chiefs 19-20).

Kalaniopu'u, the paramount chief of Hawai'i at the time of Cook's visit, was also personally involved in fishing. Shortly before his death he ordered nets from Hilo, lines from Puna and Ka'u, and went fishing. Later "there came a school of ahi fish to Kalae, [near South Point in Ka'u] and all the chiefs went down to Kalae for the ahi fishing" (Kamakau, Ruling Chiefs 110).

Kamehameha I was also noted as a great fishermen, again particularly involved in pelagic fishing. Kamakau records that Kamahemaha "used himself to take part in the work, no matter what kind it was. He helped in preparing the fishing gear or in drawing the catch ashore, or he would go out himself to sea and take part in the labor (Ruling Chiefs 176). Kamehameha was noted as a chief who "fed the people. He fished, made huge hauls, and gave food to the chiefs and people. Thus he cared for both chiefs and commoners" (190). Kamakau also recorded that "Net fishing requiring a number of men, canoes, and nets, was confined to the chiefs and men of high station. It required experts who knew where the schools of fish generally ran. So many fish were caught in
this way that even pigs and dogs were fed" (Ruling Chiefs 239). Clearly, the chiefs were expected to use their fishing experts and their monopoly of large canoes to personally direct pelagic fishing operations. Ultimately, these fishing operations must have made a significant contribution to the food supply, and helped prevent overfishing of the inshore zone.

Paramount chiefs supported a large group of followers, which included the various craft specialists, members of the priesthood, individuals skilled in war, fast runners, skilled canoe paddlers and servants. Malo notes that "It was the practice for kings to build store-houses in which to collect food, fish, tapa, malo, pa-u, and all sorts of goods." The storehouses were "designed ... as a means of keeping the people contented, so they would not desert the king" (Malo, Hawaiian Antiquities 195).

It is difficult from this passage to determine if "people" refers only to individuals that were part of the king's entourage, or to the general population. John Ii, while in Kailua, Kona in 1812, mentioned that the district was experiencing a severe famine, and that food from the king's storehouses was brought and distributed, although again it is unclear if the food was given to the people generally or only to Liholiho's court, of which Ii was a member (114). However, it is clearly the people as a whole that are referred to when Malo states that "It was the
king's duty to seek the welfare of the common people...."
He then listed eight pre-contact chiefs who were killed or banished by their people when they failed in this duty (Hawaiian Antiquities 195).

Kamakau provided a specific example where a rebellion occurred because fish were not distributed appropriately. The event occurred in the Maui district of Waihe'e in 1765. Waihe'e was a noted area for fishing, and the chiefs frequently tabued fishing to such an extent that the people were discontented. A man identified as a "soldier of the guard" who "belonged" to a chief started a rebellion because "The chiefs distributed fish to the people and left out this man and his wife." The rebellion was successful in that the erring chief was forced to flee to Moloka'i, where he was subsequently killed by Kahekili (Ruling Chiefs 83).

Kamehameha I, noted as a fisherman, was also noted for providing fish to the people. If his canoes caught a large quantity of aku or 'ahi, "he would give it away to the chiefs and people, the cultivators and canoe makers. If word was brought that 'ahi were plentiful at Kalae, [off South Point] off went the chief to the 'ahi fishing...." When flying fish were in season off Kohala, Kamehameha fished there, and would "dispose of his catch to the cultivators of Kohala, Waimanu, and Waipi'o." Many of these fish were apparently actually exchanged with farmers for either a bundle of pounded poi or a calabash of poi for
fish. In some cases, apparently believing the rate of exchange somewhat high, farmers wrapped a taro in the bundle in exchange for one fish, but Kamehameha did not punish them (Kamakau, Ruling Chiefs 203).

Traditional accounts indicate that large catches of fish were not only divided between the chief, the chief's entourage, and all people who had helped in the fishing, but also distributed to many others, both within and between districts. In some cases this could be viewed as a form of reciprocal exchange, but in other cases it is clearly redistributive exchange.

One such story concerns the head fisherman for a konohiki of Nanakuli, on O'ahu, during the early 1790s when Kahekili ruled that island. This particular fisherman possessed a "fish attracting stone" or fish god image. He and his konohiki went fishing with many canoes and nets. "On this trip, there were so much fish caught that a stench rose up on the shore. People went from Ewa, Waianae and Waialua [districts] to get some fish but the supply was inexhaustible. The fish kept coming to the same place for several days" (Kalakaua n.p.).

Another account was that of Nihooleki, a chief and a famous fisherman who ultimately became the paramount chief on Kaua'i. He was a famed aku fisherman and the owner of a pearl fishhook named Pahuhu. He normally went aku fishing in a 60 foot double canoe manned by 20 paddlers, and everytime
the fishhook was "let down into the sea and pulled up the
aku would follow it into the canoe until the canoe was
filled with them." Nihooleki's most famous fishing
expeditions, however, happened after he had died and been
worshipped by his family until he became a spirit and
returned to live with his wife. (This was not an impossible
occurrence in Hawaiian culture.) The spirit of Nihooleki
set out with his fishhook and six large canoes. Upon his
return

The wife proceeded to give away [fish], feed the
pigs, give some to the loafers, sell some, and
salt some, but a large number were still left
over, there being so many. The people from the
uplands came down with food, sugar-cane, bananas
and everything else good to eat and all went home
with fish, even those that came down without any­
thng went home with their share. Those who were
still in the uplands when they heard of the fish
came down and returned with their share.
(Fornander, Fornander Collection 4: 494)

Another legend concerned a chiefly fisherman named
Puniakaia, who lived in Kaneohe on O'ahu. Puniakaia caught
and raised a famous decoy fish, named Uhukakaika. A
"proclamation" was issued which directed everyone to go
fishing. Puniakaia released his fish, which drove or led
vast numbers of fish to shore.

The fish reached from way down deep in the sea to
the surface, and they were driven clear up onto
the sand. Upon seeing this the people began
taking up the fish, some were salted, some were
given away to the people ... from the Makapuu
point to the Kaoio point at Kualoa.
People came from all over the district of Koolau to obtain fish, but there were still fish left to feed to the dogs and pigs. Puniakaia continued to provide fish for people in this fashion, not only on O'ahu but on Kaua'i (Fornander, *Fornander Collection* 5: 154-162).

In another Hawaiian account of ulua fishing, a prayer to the fish, for success in fishing, is recorded as follows: "Your eyes will be eaten after a drink of awa, your flesh cut as far as the head, your head cut with an adz, your flesh apportioned and divided among the houses (of the neighborhood)" (Kalaeloa n.p.).

Regardless of the exact literal "truth" of such legends, they are part of the evidence which indicates that ali'i did function as redistributive chiefs. Such a common theme in the oral tradition would be unlikely if redistribution was not frequently practiced as a result of fishing expeditions directed by ali'i.

Kamakau provided a specific example of how kala fish were redistributed. In this type of inshore fishing, traps were used, and the kala were fed for several days in advance. The traps were woven by specialists under a tabu, and the actual fishing was carried on by fishing specialists. The traps were set by fishermen in canoes, and each trap was large enough to hold up to sixty fish.
The day on which the *hina'i kala* [trap for *kala*] were dropped in the sea was a well-publicized day, and visitors, peddlers, and traders as well as kinsmen, friends, and relatives came. The first *kala*, those taken on the land holder's day ... went to the chief of the land, but the fisherman got a share from the fish set apart for the *akua* [gods], perhaps five fish from each basket ... A chief who looked to the welfare of the land, however, gave twenty or forty fish from each trap to the *akua*, and from these the fishermen got a share. The chief's day was the first day the *hina'i* were lowered ... The second day the take was for the *kama'aina* of the land and for the fisherman, and that day his kinsmen and relatives gathered. (Works 84-85)

Kamakau recorded that large quantities of fish were obtained by this method, forming "a pile as big as a house" which might contain forty thousand fish. (Works 85). Presumably all "the *kama'aina* of the land" ate well for several days.

Many references exist to the fact that fish caught under the direction of a *konohiki* were often allocated by him to all who had participated in the work. In octopus fishing, almost certainly regulated by the *konohiki* to prevent overfishing, the fishing day was announced to men and women and all participated both in shallow water and in canoes. Enough octopus might be obtained to "fill forty or fifty canoes", and were piled on the shore. Then "the *he'e* [octopus] were portioned out, fifty to a hundred each. In this way they were divided among the *konohiki*; the land holders, *haku*; the chiefs, and those who had done the spearing." However, "If a man were bad he hid part of his
catch in the sea, and after the dividing was over he went out and got it" (Kamakau, *Works* 70-71).

According to Kamakau, in many methods of fishing a large share of the fish either went to the ahupua'a chief (or higher chiefs) or was used by the fishermen to obtain the necessary equipment in what Kamakau terms trade, but which was really a form of reciprocal exchange. Bag net fishing with melomelo sticks required a large net, a head fisherman, and about twelve experienced divers per net. Kamakau described the distribution of fish after they were brought on shore, where a large bag net could fill ten to twenty canoes with fish.

Fish would be given to the divers and the helpers; to those who had gotten the nets ready on land; to those who had set the net for the fish to enter the papa, and to those on the canoe which had carried the nets. When the fish was distributed, the largest portion went to the fisherman. His wife also got a large share for herself and her relatives. She got several canoe loads, for she had a major right in the nets. However, if the fishing had been done by a master fisherman ... for a chief, the chief provided all the supplies and was the head, po'o (to whom most of the fish went). But if the fisherman had no master, he himself was the po'o. Most of his fish went for fishing equipment—olona, fishing lines, nets, and canoes. To be equipped for the fishing profession many nets had to be made or traded for; cordage for them had to be twisted and nets made. So it was with canoes ... with fishing lines—they had to be made or traded for. The fisherman actually ate only a small part of his catch. (Kamakau, *Works* 64)

There are frequent references to the exchange of fish for cultivated foods, indicating that reciprocal exchange
was extremely important. In discussing aku fishing in the "old days" (by which a time at least prior to 1819 is meant) Kamakau notes that when the large double and single canoes came in with fish, "there would be trading, peddling, and paying for poi, for pounded taro, sweet potatoes, bananas, sugar cane, breadfruit, and other kinds of foods; ... for all the things the fishermen needed" (Works 73). The head fisherman offered fish to the 'aumakua, and subsequently gave a share of fish to those who had paddled the canoe, to the canoe owner (probably an ali'i), to those who had caught the bait, to whomever owned the net used to catch the bait, to the men who had chummed the fish and to those who had actually caught the fish. "The rest was for the head fisherman or for the land holder, if it had been the land holder's fishing expedition" (Works 74).

Since fish was particularly plentiful in some ahupua'a and districts, it almost certainly was an item of exchange for food with other areas which had relatively few fish. A legendary account of such trade concerned the Kona chiefess Kaulanapokii, who married a chief from the neighboring Kohala district. Her five brothers frequently went aku fishing, as they were the owners of some very rare pearl fishhooks, and traded fish for cultivated plant foods with the "traders" from Kohala. After her marriage, Kaulanapokii's Kohala husband requested and was given a hook of his own, but was unsuccessful as an aku fishermen since
he merely sat in his canoe with the hook in his hand, expecting the fish to jump in "of their own accord."

When, due to a drought, food became scarce in Kona, the brothers fished for aku and went to Kohala to trade for food, something they were apparently accustomed to doing. The Kohala chief however, angered at his inability to catch fish, had the brothers beheaded, cooked, and eaten. Later, the brothers were restored to life by their sister (Fornander, Fornander Collection 4: 562-568). Once again, the literal "truth" of the legend is not the issue, but it does seem to record a traditional and long-standing exchange between two districts. The exchange was organized by chiefs and involved foods that were scarce in the individual districts. Quite possibly, the food obtained by each chief was subsequently redistributed within the district.

Examples of exchange between districts and even islands exist from the post contact period. Ii, for example, notes that while on board a ship sailing from O'ahu to Kailua in Hawai'i in 1812, aku fishermen from the Kona coast met them to trade fish for pa'i'ai, or hard poi brought from Honolulu (109). However, precontact exchange between islands and districts not ruled by the same chief was probably rare enough so that the unequal distribution of resources constituted a source of warfare.

Unequally distributed resources included fishponds and fishtraps, and the extent to which fish from aquaculture
were redistributed either within or between ahupua'a or districts is of some concern. As noted earlier, the largest stone-walled ponds and traps (loko kuapā and loko 'ume'iki) were located within the boundaries of a few ahupua'a and might have been another type of joint property, as were the fisheries. On the other hand, these types had probably been built by organizing the labor of an entire district, and the district could have shared the fish via redistribution. Most types of fishponds were concentrated within the boundaries of particular districts with favorable terrain, and as will be shown many districts and islands were not able to supplement their fish supply via aquaculture. As a further complication in determining the contribution of aquaculture to the maritime economy, there is considerable evidence later in the post contact period that many types of fishponds were the exclusive property of chiefs, who used them on occasion to feed their personal entourage, but primarily reserved them as a form of chiefly conspicuous consumption.

The geographical distribution of the major fishpond types is shown in Table 1. The loko kuapā fishponds were not found at all on Kaua'i or Ni'ihau, while O'ahu had had 64 such ponds and the much smaller island of Moloka'i had 40. The island of Hawai'i, which had the largest population at contact, had only 14 loko kuapā. According to Kikuchi, these fishponds were under the exclusive ownership of ali'i.
Table 1. Fishpond Distribution

<table>
<thead>
<tr>
<th>Island</th>
<th>Loko Pu'uone</th>
<th>Loko Ume'iki</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawai'i</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>Maui</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Lana'i</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Moloka'i</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>O'ahu</td>
<td>64</td>
<td>23</td>
</tr>
<tr>
<td>Kaua'i</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Ni'ihau</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: After Kikuchi (39)

Kikuchi stated that two types of ponds formed primarily by natural process were also exclusively owned: loko pu'uone, created by the development of barrier beaches, and loko wai, inland natural lakes or swamps. Ninety-six loko pu'uone were recorded, mostly on O'ahu and Hawai'i, and 107 loko wai, almost all on O'ahu. The remaining types of fishponds, primarily the loko 'ume'iki or stone-walled fishtraps, (all on Moloka'i and Lana'i) were freely used by all members of the ahupua'a (99).

Ali'i in charge of a particular land unit always had the right to appropriate resources for whatever purpose. The loko kuapā and the loko 'ume'iki were almost certainly built with labor directed by ali'i. It is difficult to explain why two natural types of ponds, plus one type built
by the chiefs (loko kuapā) should be for the exclusive use of the chiefs, while another type built by chiefs, (loko 'ume'iki) should be available for the use of the entire ahupua'a. The evidence for ali'i treatment of certain fishponds as private property comes from rather late in the post-contact period. It is therefore possible that these accounts are a reflection of the adoption of more western concepts of property ownership, as some have claimed (Devaney et al. 143). It is also possible that the increasing restrictions placed upon fishpond products were simply part of the overall change from a kinship mode of production as Hawai'i became a fully developed state.

There is some evidence for this interpretation, both from westerners and Hawaiians. Western accounts which describe the fishponds as the exclusive property of the high chiefs date entirely from after 1810, when Kamehameha had finally united all the islands and had established what was clearly a state. Earlier western visitors who described fishponds (most did not) either do not mention how or if the fish were distributed, or else indicate that the fish were used in general to supplement otherwise poor fishing resources.

One westerner to mention aquaculture was Meares, who visited O'ahu in 1788 and 1789. Captain Douglas, sailing with Meares, was shown around Waikiki by Kahekili, and saw "some large ponds, which appeared to be full of fish. He
[Kahekili] mentioned also some others where he had a quantity of turtle, and promised to bring some on board the next day" (Meares 20).

Archibald Menzies, who accompanied Vancouver as surgeon and naturalist in the early 1790s, recorded fishponds at both Waikiki and Lahaina. He was extremely impressed with the productivity of Waikiki both in terms of agriculture and aquaculture, and also noted how the environmental changes created by the Hawaiians had attracted large numbers of waterfowl. Menzies described Waikiki as

[N]early level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes and the cloth plant. These, in many cases, were divided by little banks on which grew the sugar cane ..., and the whole was watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to be able to supply the most distant fields at pleasure ... Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with water fowl of various kinds such as ducks, coots, water hens, bitterns, plover, and curlews. (23-24)

The ship's doctor off Charles Bishop's ship visited Waikiki in 1796 and passed "several ponds of Fresh water... full of Fish..." (Bishop 182). Two years later, Ebenezer Townsend spent several days taking in supplies off Waikiki. Accompanied by Issac Davis as an interpreter, he described many of the basic aspects of the culture at some length. He noted that the Hawaiians "have artificial fish ponds both of fresh and salt water, without which their supply of fish
would not be bountiful" (19). Townsend also recorded that the fishponds were restocked annually with fish "in season when fry [baby fish] are in schools" (28).

William Shaler, who visited the islands several times around the turn of the century, was also of the opinion that the fishponds served to compensate for the relatively few numbers of fish available naturally, an interpretation which implied that many people benefited from the fishponds.

Neither are the seas of these islands abundant in fish, which they, in a great measure, remedy by fish-ponds, which are contrived with great intelligence: they have them of both salt and fresh water. The mullet and a fish of the herring species ... visit their coasts periodically, when they are very careful to stock their ponds with the young fry, where they thrive surprisingly: by these means, fish are sufficiently abundant. (88)

Kamakau also believed that the people generally benefited from the presence of loko kuapā on their lands, and that pu'ucone and loko wai ponds were easily accessible to the commoners. The loko kuapā were also taken by Kamakau as a sign that districts and islands must have been united, since it would take so many people to build the huge seawalls. "If they did not eat the fruit of their efforts how could they have let the awa fish grow to a fathom in length; the 'anae to an iwilei, yard; the ulua to a meter...?" (Works 47).

Kamakau described the system by which each loko kuapā had caretakers assigned to it by the konohiki, and during nights of high tide the caretakers slept near the sluice
grate to prevent fish from being taken by "thieves." The caretakers were allowed to eat freely of certain kinds of fish, including the aholehole and the awa'aua, "but the fishes reserved for the chiefs they would eat secretly."

However, during certain months,

\[\text{When the sun was warm and the Kona wind--or the wind customary then at the pond--blew, the makaha would be filled with fish, for they persistently went into fresh winds. That was when the fish were taken to be eaten, for if they were left they would die, and a stench arise. That was the time when fish were traded. (Works 48-49)}\]

Unfortunately Kamakau does not specify with or by whom the fish were "traded," for what, or exactly what is meant by the term. Certainly it is possible that fish were traded with farmers for food to support the chief's establishment; however, chiefs did not need to trade for that purpose since they could requisition whatever they needed. Therefore it is also possible that the extra fish were simply distributed. The remaining possibility is that Kamakau was actually describing the post contact situation where chiefs may indeed have sold fish from their ponds.

Kamakau specifically states that the many variations of loko pu'uone, naturally occuring brackish or salt water ponds, were "much desired by farmers" who enlarged such ponds, built a sluice grate, and stocked them with fish fry. The people also loved the lands "where the freshwater ponds, loko wai, were, for they furnished them with fresh 'opae, crisp limu-kala-wai, reddish 'o'opu roe, and lu'au. The
people of the old days who lived on such lands lacked nothing" (Works 49-50). This description does not indicate such ponds were the exclusive property of chiefs.

The Hawaiians believed that the supply of fish produced by a fishpond was regulated by a spiritual guardian of the pond, a mo'o. In one legend, at a time there was abundant young fish in the sea the konohiki became "haughty and indifferent to the welfare of the poor and the fatherless." He broke the gourds of the women and children collecting shrimp and other fish.

Then the guardian mo'o, who loved the poor and the fatherless, would take away all the "fish" she had given for high and low alike, for the rich and the poor. When she saw the rights of the many abused, she took away the blessings altogether, leaving nothing but the rocks. Her chagrin could not be appeased by supplication but by penitence and restitution; that was the only way to bring prosperity back to the land. (Kamakau, Ka Po'e Kahiko 84-85)

This legend is once again an indication that chiefs and their appointed konohiki were expected to be generous and utilize their resources to feed the people. The earliest western visitors believed that aquaculture did indeed help feed the people by supplementing otherwise relatively scarce marine resources. Kamakau also believed that the people benefited directly from the large loko kuapā and loko 'ume'iki which took so much labor to build. He also stated that the fishponds shaped primarily by natural forces were utilized by the commoners. This would indicate that the
pattern of exclusive use by the chiefs for many types of fishponds was a post contact development.

Even without direct redistribution to commoners within an ahupua'a or district, Apple and Kikuchi (2) have argued that the people would indirectly benefit from the fishponds. If chiefs only used their ponds to help feed their own entourage, there would be less demand on the commoners' food resources. In order to maintain productivity, fishponds had to be frequently cleaned, since the organic muck at the bottom produced hydrogen sulfide which killed young fish. This work was done by commoners under the direction of the konohiki, and often involved draining the pond. While at work on the pond, commoners were often free to take as much fish as they wanted (30).

Aquaculture, regardless of whether or not the products were directly or only indirectly of benefit to the commoners, was a means of intensification of production. Productivity of fishponds, based on recent studies, has been placed at approximately 350 lbs. per acre per year. Since in 1800 there were about 5,025 acres of fishponds in Hawai'i, the aquaculture system produced an annual yield of 1,758,750 pounds, or 4,818 pounds per day (Apple and Kikuchi 42). Regardless of whether or not fish were on occasion distributed to the commoners or merely utilized by ali'i to feed their immediate followers, fishponds and traps represented an important food source of those areas which
possessed them. Neighboring ahupua'a, districts, and even islands who were experiencing population pressure, famine, or were merely in the hands of ali'\textsuperscript{i} who sought to increase their own power and status, could solve many problems by expanding into areas with productive fishponds. As will be discussed later, there is some evidence that this is exactly what happened.

In many redistributive chiefdoms, much of the redistribution takes place during feasts that are usually part of religious ceremonies. The Makahiki was clearly in part a religious ceremony during which large quantities of food and goods were collected by ahupua'a, district, and paramount chiefs. Malo, who provided the best description of the Makahiki, stated that the Makahiki tax was primarily in tapa, articles of clothing, dogs, pigs, feathers, and bundles of pounded taro. The last article was for the consumption of the men who carried the Makahiki god, and the other goods were divided among the chiefs and their followers. Malo specifically stated that "No share of this property ... was given to the people" (Hawaiian Antiquities 143).

Kamakau, in his account of the Makahiki, mentioned two specific items acquired by the ali'\textsuperscript{i} in taxes: olonā fishnets and fishlines. These items were then used by the ali'\textsuperscript{i} to support the benthic and pelagic fishermen. Kamakau stated that "Most of the wealth received in this circuit of
the god was given to the crowd--to the people who attended to the god, to those who carried the image, to the people in the procession. Only the most valuable things were saved and displayed before Kamehameha." (Ka Po'e Kahiko 21). It is possible that the term "crowd" included large numbers of commoners.

Shortly after the end of the Makahiki, the paramount chief began to build one of five types of temples or heiau. Each type had a different function and apparently involved vastly different amounts of labor, time, and ritual. Seaton has suggested that the type of heiau selected for construction related to the economic situation. The annual cycle of the Makahiki provided the ali'i with an excellent opportunity to assess the productivity of each ahupua'a and district. Seaton's hypothesis is that, depending upon the economic and ecological problems discovered, the ali'i nui chose to construct a specific type of heiau which ultimately had the effect of restoring both ecological and political equilibrium to the culture. He thus views the Makahiki as "a ritual instrument for the regulation of the Hawaiian ecological system" ("The Early State" 281).

While such an interpretation of the Makahiki seems highly probable, existing descriptions are so inadequate that it is difficult to specify exactly how the Makahiki and subsequent heiau construction regulated the ecosystem. One heiau that might be built was termed a heiau-loulu,
apparently a rather crudely built, open-sided structure with a flat roof thatched with loulu palm leaves. The purpose of this specific heiau was to propitiate the fishing dieties and insure an increased supply of fish. Presumably the decision to build this type of heiau was made if a decrease in certain fish had been observed over the past year and in particular during the Makahiki. The fact that so little labor was required to build such a heiau might well indicate that the ali'i found it difficult to help subsidize the larger labor force required for the more elaborate types of heiau.

Malo stated that construction of the heiau-loulu (or any type chosen by the ali'i nui) began at the start of either Kaulua (February) or Nana (March) (Hawaiian Antiquitites 152). With respect to fish, he also states that Kaulua is when the mullet spawn and Nana when the flying fish swarm (ie. spawn). Most Hawaiian fish are summer spawners and many begin their spawning season around March (Gosline and Brock 23). Hence tabus on any species of fish that went into effect as part of the construction of a heiau-loulu might well protect them during their spawning season. Unfortunatly there are no descriptions of tabus associated with the construction of a heiau-loulu. The construction of other types of heiau described by Malo definitely did involve a number of food tabus and behavioral tabus which would influence food acquisition.
Two of the more elaborate temples that could be built were what Malo referred to as an "ordinary luakini" and a luakini kaua (Hawaiian Antiquities 153). Seaton suggested that the first type was built to indicate "ecological balance", and that the second type, a war temple, was built "under conditions of population pressure for expansion" ("The Early State" 283). Malo provided an elaborate description of the ceremonies and tabus associated with the erection of luakini, although it is difficult to ascertain if he is describing the construction of an ordinary luakini, a luakini kaua, or both. That population pressure might indeed be a consideration is indicated from one detail of the ceremony.

In order to complete the dedication of the temple it was necessary to find, far out in the ocean, a large tangle of seaweed, called the 'aha. Until the seaweed was found, a tabu requiring sexual abstinence was in effect. If it was not found, "people and chiefs continued indefinitely under tabu and were not allowed to come to their women folk." Since finding the seaweed clearly involved chance, Malo recorded that "The tabu might ... continue in force many months, possibly for years, if the aha were not found. It is said that 'Umi was at work ten years on his heiau before the aha was found, and only then did they again embrace their wives" (Hawaiian Antiquities 160).
According to Malo, a luakini kaua was built when a ruler "was about to make war upon another independent monarch or when he heard that some other king was about to make war against him" (Hawaiian Antiquities 160-61). The fact that wars and disputes were hence often deliberately announced to the other side might indicate that the ali'i did indeed specifically evaluate population pressures and available resources in their decision as to what type of heiau to build, and consequently, whether or not to go to war. There exists a considerable body of evidence indicating that warfare was indeed frequently over access to resources, often maritime resources and fishponds.

**Maritime Resources and Warfare**

In his description of the goals of religious worship in Hawaiian culture Malo states that "Land was the main thing which the kings and chiefs sought to gain by their prayers and worship ... The common people ... prayed that the lands of their ali'i might be increased ..." (Hawaiian Antiquities 142). Land in the late precontact period could not be increased by any other method than warfare. In Hawaiian culture this meant the complete productive unit that was an ahupua'a, and included its fishponds and the attached fisheries which were extensions of the land.

The traditional history of the island of Hawai'i provided evidence of a pattern probably repeated on most other islands: disputes between windward and leeward chiefs
for the leeward fishing grounds. 'Umi-a-liloa, one of the chiefs who successfully unified the island, discontinued an earlier pattern of Hawai'i chiefs residing in Waipio when he moved the royal court to the Kona coast. One reason given for his choice of residence was the fishing grounds off the Kona coast, "which from time immemorial had filled the minds of the chiefs of the eastern and northern parts of the island with golden dreams of a luxurious life, and which continued to be a constant cause of bitter feuds between those who coveted its possession" (Fornander, An Account 101).

During the time of one of 'Umi's immediate successors the practice began of redistributing the ahupua'a and districts among favorites and close relatives of the new paramount chief. Fornander recorded that this frequently caused discontent and ultimately rebellion, due to the fact that resources were not equally distributed among the windward and leeward sides of the island.

In this periodical distribution and redistribution of the lands of the islands, regard was generally had to the advantages of the country and the wants and convenience of the chiefs who shared in the division. Thus the chiefs on the windward sides of the island ... always coveted the lands on the leeward side, the Kona districts, on account of its mild climate and its rich fishing-grounds; while the Kona chiefs coveted the lands in the windward districts on account of their streams of running water, their numerous taro lands, and abundant food. To accommodate, adjust, and conciliate these ever-clashing claims was the great business of state on the accession of a new monarch. (Fornander, An Account 300)
Certain interisland wars also involved intraisland disputes. Kuali'i was a 17th century O'ahu chief who became involved in a dispute between two groups of Moloka'i chiefs. Fishery rights were the cause of the dispute.

The chiefs on the Koolau [windward] side of Moloka'i were anxious to get possession of Kekaha [on the leeward side], ... and the reason why these chiefs were so desirous of getting possession of this section of country was on account of the fishing. But the chiefs of Kekaha, knowing the value of these fishing grounds, were determined to hold on to them; so this determination on their part caused a general internal conflict at this time. (Fornander, Fornander Collection 4: 416)

Kuali'i joined the dispute on the side of the leeward chiefs, but in the process apparently conquered Moloka'i and left his own chief in charge of the island before returning to O'ahu. Kuali'i later went on to annex portions of Kaua'i and the island of Ni'ihau, and possibly Maui and Hawai'i as well (Fornander, Fornander Collection 4: 364-428; also Fornander, An Account 282-288).

The leeward coast of Moloka'i, noted not only for its bounteous fisheries but also its many fishponds, proved to be an attractive piece of real estate. Alapa'inui, who united the island of Hawai'i in the early 18th century and could have united all the islands, restrained himself because of kin ties with the ruling families of Maui and O'ahu. Nonetheless, when the O'ahu chief Kapiohookalani invaded Moloka'i, Alapa'inui also invaded. Kapiohookalani was defeated, but not before he had managed to destroy some
fishponds so that they would not fall into the hands of Alapa'i (Kamakau, Ruling Chiefs 70). More than likely, Kapiohookalani, by his invasion of Moloka'i, was abrogating an agreement which permitted Alapa'i access to the fisheries and ponds of that island.

Four politically independent chiefdoms were in existence in Hawai'i at contact, a reduction of at least two and possibly more from the number in existence some two hundred years earlier. Under the leadership of certain ali'i the number of chiefdoms may have been two or less for brief periods in the past. Based upon Fornander (An Account), Hommon cited twenty examples of the conquest of one island by another between the 15th century and Kamahemaha's 1785 campaign to recover two east Maui districts. In Hommon's analysis, a major motivation for such conquest was the control of the interisland channels, including the associated fishing rights (Use and Control 72-77). Without question, for the last two hundred years before contact, warfare both between and within islands was endemic to Hawai'i.

The conflict had more than one function. Demographic and ecological pressure together with an environment where key resources were unequally distributed provided the context for the political competition over the means of production as Kirch has also noted (Evolution 206).
Attempts to exercise political power within a basically kinship mode of production were the "Achilles' heel" of Hawaiian culture at contact, a term Wolf has used for other kinship societies in similar situations (94). Warfare was the only means for a chief to obtain access to more resources and labor, yet warfare placed extreme stress on the producers. Acquisition of more land increased administrative costs but did not free the chief of his obligations as senior kinsmen to redistribute resources. The source of his ability to allocate labor and limit access to resources in an ecologically conservative manner was based upon his role as an elder kinsmen and intermediary with the gods. Without access to resources independent of ideas of kinship, chiefs were always challenged by other descent lines, and a true political state was impossible. This scenario, presented in chapter one, appears to be substantiated by an analysis of the maritime resources and mode of production.

Contact with a capitalistic mode enabled chiefs to obtain access to resources independent of kinship, and ultimately helped them destroy the kinship mode of production in Hawai'i. As described in this chapter, many aspects of that mode represented an adaptation to the maritime environment which essentially maintained a state of equilibrium. The ecological effects of Hawaiian fishing were limited, in part because so many species in so many zones were exploited by so many techniques. Access was
restricted by the *ahupua'a* concept of group ownership (or use rights) to maritime resources, which encouraged careful use since *ahupua'a* members could not easily go elsewhere if they depleted their own fisheries. *Ali'i* often acted to maintain maritime resources at a high level of productivity, and maintained the religious cycles which also limited access to ocean resources. *Ali'i* were particularly responsible for the support of maritime craft specialists, for directing the important pelagic and benthic fisheries, for the intensification of production represented by aquaculture, and for redistribution of certain maritime resources.

The maritime system was so finely-tuned an adaptation that even minor changes were likely to have negative effects. Prolonged contact with any culture in a capitalist mode of production might well have caused its collapse. In actuality, America's own system of ocean exploitation and America's need to participate in the world market, together with the opportunity this contact gave *ali'i* to obtain access to resources independent of kinship, were the cause. The interaction of *ali'i* and Americans, and how together they negatively affected maritime production, will be examined in detail in the next two chapters.
CHAPTER FOUR
ENTANGLEMENT IN THE MARKET SYSTEM 1778-1819

INTRODUCTION: CULTURAL COLLISION

Island ecosystems, isolated for large periods of time from the massive shifts and accommodations necessary on the continents, are characterized by extreme vulnerability. When their isolation is ended, the tendency toward instability and rapid change is great (Fosberg 5). To some extent this was true when the first Polynesians came to Hawai`i, bringing a variety of plants and animals and ideas about a socialized landscape. The biological vulnerability was even more evident when human contact was reestablished after 1778. Outsiders introduced an ever-increasing number of plant and animal species and, tragically, human diseases which had evolved in the highly competitive continental regions.

In the case of Hawai`i, it is tempting to claim equal vulnerability for isolated island cultures, so rapid was the change in the forty years after Cook's ships left in 1779. If there is any validity for such a claim, than presumably contact with any culture in any mode of production might have precipitated change. Yet of continental cultures, for the most part only those in a capitalistic mode had both the resources and motivation to reach Hawai`i. More important, only cultures in a capitalistic mode of production had reason to return again and again to the islands, first for
provisions and later for sandalwood as well. Only cultures already part of the market system could be interested in the fortuitous location of Hawai'i between newly discovered commodities in the Pacific northwest and markets in China. As described in chapter two, of all cultures in a capitalist mode America in particular had both the resources and the urgent motivation to pursue first the northwest sea otter and later the Hawaiian sandalwood to sell in the China market. Although England was involved in the northwest trade, by 1795 Americans numerically dominated that trade, and in the material sense which is the focus here had become the major source of cultural change in Hawai'i.

The purpose in this chapter is to examine what aspects of the Hawaiian maritime mode of production changed, how they changed, and why. Precontact Hawai'i, as already described, had finely-tuned all aspects of its mode of production to the particular environment. It had stabilized population and may have been near the limits of the carrying capacity of the environment within its particular technology. This was probably a contributing factor in the political instability so evident in Hawai'i immediately prior to contact.

Within a kinship mode of production the ali'i were still closely tied to the maka'ainana by mutual reciprocal obligations. Among the ali'i obligations was that of maintaining the marine ecosystem and protecting it as an
important food resource, an obligation supported by religious sanctions. Ultimately, as Caroline Ralston pointed out in her article on the maka'ainana response to cultural change, Hawai'i was a closed system. Chiefs found it difficult to hoard wealth, since other than a very few items such as feathers and whale ivory, wealth consisted of highly perishable food items. Taro could be kept only in the fields, fish only in the fish ponds. Hence although the ali'i could and did collect large quantities of foodstuffs, rapid redistribution was necessary (25,36). Hawai'i had not, perhaps for this reason, developed out of a kinship mode of production or into a political state.

By 1819, some 40 years after Cook's discovery, Hawaiian culture had changed dramatically, and the stage had been set for equally dramatic change in the next three decades. For the most part even the "form and idiom" of the kinship mode of production had disappeared, moving Hawai'i into a tributary mode of production. Since this happened in the presence of, and in part because of, the capitalist world system, Hawai'i by 1819 was already entangled within that system, even though its own internal economy could not as yet be termed capitalistic. Secondly, a true political state had emerged, uniting the islands under a system which severed even the semblance of kinship between ali'i and commoners. Ultimately, in 1819 the supernatural support for
the system of mutual obligation between ali'ī and maka'ainana was destroyed when the formal religious system was abolished.

In the maritime system major changes occurred in the social relations of production. Ali'ī continued to support craft specialists in even larger numbers than traditionally, but many were foreigners or were trained in the manufacture of foreign artifacts. Chiefs began to monopolize any local product which could be exported or traded for western goods. This included fishline, huge quantities of which were acquired in taxes, and pearl shell as well as pearls. Kamehameha I became involved in the manufacture of western sloops and schooners, and fewer large double canoes were built and maintained.

A few specific techniques of fishing which were dependent upon many canoes, nets, lines, and the allocation of labor by the chiefs disappeared. Quite possibly benthic and pelagic fishing decreased in general, and the knowledge of fishing grounds began to be lost. This was due not only to the deaths of skilled fishermen before they passed on their knowledge, but also the increasing lack of support for the fishermen on the part of the ali'ī. Ali'ī functioned less and less frequently as redistributive chiefs. Fishponds became significant as exclusive resources of the chiefs, necessary to help support their increased entourage. If benthic and pelagic fishing were decreasing, the need to
support ali'i craftsmen and servants would probably have been a major motivation in the move to exclusive rights over fishponds. Ultimately the religious tabus, a major component of the system which preserved the marine ecosystem by limiting access, were abolished.

In the material technology of fishing relatively few changes occurred, and changes in techniques were few. Population decreased to such an extent that the pressure on the various marine habitats probably decreased during this time period. There is little evidence of any major shortage of marine products, either due to fewer people catching fish or to an actual decline in the marine environment. Nonetheless, the stage was set for an actual shortage of fish and the beginning of environmental depletion in the following period.

The question of why these changes occurred, and how much was externally and internally caused, will also be considered in this chapter. Ultimately, the question cannot be answered in a simplistic fashion. Western contact was not the sole reason for change, nor were all changes up to 1819 due to the internal dynamics of Hawaiian culture.

When Cook's ships anchored off Waimea, Kaua'i in early 1778, they discovered one of the most complex ranked chiefdoms ever known to ethnohistory or ethnology. Archaeologist Barbara Price has pointed out that when state-organized societies expand, "the course of contact is
determined not solely by the expanding states itself, but also by the organization (and the mode of production to which it is causally linked) of the target area" (166).

When states expand into contact with egalitarian bands, the result is frequently tribalization (or annihilation) of the band level society. (The reference here is to the band, tribe, chiefdom, state sequence of Service, described in chapter one.) When the state confronts a ranked chiefdom, and that chiefdom is exploiting a resource desired by the state whose production can be increased through the intensification of labor, the result is secondary state formation. If the chiefdom contains a desirable resource (from the perspective of an expanding state) but is not itself exploiting that resource, the result of state pressure may be tribalization. Price hypothesized that Hawai'i in the early contact period was an example of the first type, where contact led to state formation, while the Maori were an example of tribalization (180-182).

Hence the outcome of any "collision" between two cultures depends on the characteristics of both. This was precisely the point of Eric Wolf's criticism of the Wallerstein/Frank approach to the expansion of the capitalist world-system: they considered only the nature of that expanding world-system, and presented the cultures engulfed by it as hapless and helpless victims. Europeans encountered many chiefdoms in their expansion during the 16th-19th
centuries. Wolf contended that the high status chiefs in these cultures frequently were active participants in the process of state formation and the internal economic transformation which had to accompany it. Most of Wolf's examples of this joint process of state formation were in Africa. However another example can be found in Hawai'i, where the ali'i were also active and cooperative partners in the process of state formation and in changing the mode of production.

It was not only the indigenous culture which determined the outcome of cultural contact. The exact nature of the experience depended upon which of the many nations involved in the expansion of the capitalist world-system was the major source of interaction.

England discovered Hawai'i for the market system, and England was the dominating influence for most of the first two decades after discovery. The discovery took place during the American Revolution, however, and at its conclusion America, short on money and in need of imports, immediately expanded its search for commodities into the Pacific. In the meantime England became increasingly involved in affairs on the European continent, ultimately culminating in the Napoleonic wars. As a result, America, specifically New England, became the dominant influence in Hawai'i. A British trader recognized this fact when he wrote in 1803:
The Americans carry on in particular a most active trade with these islands, supplying them with property at an easy rate in exchange for provisions, and, unless I am much deceived, will do more than any others to exalt it to a singular degree of civilization. (Turnbull 13-14)

Between the years 1785 (when the northwest fur trade began) and 1794, thirty-five British ships visited the northwest compared to only fifteen American ships. In the next nine years, however, (1795-1804) only ten British ships were involved in the fur trade, compared to at least sixty-eight American ships. Most if not all of these ships stopped at least once in Hawai'i for provisions, and many made several visits. The American dominance of the fur trade continued after 1804, and when Hawaiian sandalwood became important around 1810 that trade was also monopolized by the Americans (Rydell 27-28). Although England was to remain important to Hawai'i long past 1819, the Americans were not only numerically the most important after 1795, they represented the major contact for the ali'i with the world market system.

It is tempting to classify most Americans in the late 18th and throughout the 19th century as opportunistic, in both biological and standard connotations of the word. In biology, the term is often applied to plants with basically "weedy" characteristics, the types of plants which grow in an extremely wide variety of habitats and tend to out-reproduce whatever occupied that habitat before they were
introduced. In more general terms opportunistic is a term applied to individuals who are both adaptive and relentless at pursuing their immediate interests, with little concern for the ultimate consequences.

As presented in chapter two, in the decades following the American Revolution New Englanders were forced into a form of opportunism in both the biological and standard sense. For them, the ocean became the road to all possible commodities needed by the new United States in order to participate in the market system. Ultimately, Americans came to epitomize the values of the capitalistic world-system. John Turnbull remarked on this in 1803, and he too utilized a biological analogy to try to explain what Americans were doing.

So far does [American commerce] exceed all former efforts of former nations, that even the Dutch themselves sink under the comparison. Scarcely is there a part of the world, scarcely an inlet in these most unknown seas, in which this commercial hive has not penetrated. (14)

The Americans who participated in the oceanic expansion of their world-system were not on the whole contemplative men, particularly in the period prior to 1819. The Frenchman Fleurieu, writing in 1801, was already aware that Americans had essentially taken over the Pacific northwest fur trade, and noted regretfully that "Americans act more than they write" (cxlvi). Certainly this was true: major primary sources for this chapter include the journals and
accounts of some the first western visitors to Hawai'i, but most are by non-Americans. Of those few authored by Americans, almost none are of logs or journals which the author intended from the beginning to publish. Most were either published long after the author's death or were written late in life by the author in order to sustain himself in old age.

Richard Cleveland was one such man, who as captain, supercargo and shipowner managed to make and lose several fortunes between 1792 and 1825. Ultimately friends obtained a steady but low-paying job for him in a customs house. Cleveland probably spoke for common seaman and ship owner alike when he noted that in his early years at sea he was motivated by "a spirit of adventure united with that of acquisition" while in his later years "the latter was to act alone" (2: 1).

Cleveland and other Americans like him gave little thought to the effect that such "acquisition" might have upon the various cultures with whom they came into contact. For the most part they simply accepted the superiority of their own culture, and assumed the consequences of cultural contact could only be beneficial to other types of societies. Cleveland, long after his seafaring days were over, believed Hawai'i had clearly benefited from American traders. At the time of his first visit in 1799 Hawaiians were in a "barbarous state," but by the time he published
his narrative in 1842 they were a "comparatively civilized people." This change he believed to be "a most remarkable instance of the ameliorating and humanizing effects of commerce" (1: vii).

Americans, of course, were not the only ones convinced of the benefits of the world market for indigenous cultures. The British Captain George Vancouver was a man much more given to contemplating the results of his own and others' actions. The Polynesians and American Indians with whom he had contact were described as "the less-enlightened part of our species," and he was extremely satisfied that his own actions had introduced "various commodities of a most valuable nature" to these cultures. He was confident that these commodities always either contributed "to relieve their necessities, or augment their comforts." While Vancouver clearly realized that western nations (and individuals) were economic beneficiaries of cultural contact, he was convinced the exchange was reciprocal.

A mutual intercourse has been also established, in many instances, on the solid basis of a reciprocity of benefits; and the productive labour of the civilized world has found new markets for the disposal of its manufacturers. Nor has the balance of trade been wholly against the people of the newly-discovered countries; for, whilst some have been enabled to supply their visitors with an abundance of food, and the most valuable refreshments, in exchange for iron, copper, useful implements, and articles of ornament; the industry of others has been stimulated to procure the skins of animals, and other articles of a commercial
nature; which they have found to be eagerly sought for by the traders who now resort to their shores from Europe, Asia, and the eastern side of North America. (1: a)

Most Americans at sea during this period would have agreed with Vancouver, even if they could not express it so well. Few Americans involved in the trade questioned that their personal desire for monetary gain was anything but a benefit to other societies. On the other hand, almost none of these Americans looked upon the Hawaiians or others with appalled eyes which questioned their humanity, as some later missionaries to Hawai'i were to do. Many were surprisingly non-judgemental, perhaps because as seamen they had been exposed to many more cultures than the average American. Charles Barnard was one American who clearly presented the case for cultural relativism long before anthropologists were to invent the term.

According to the various education, habits, and modes of thought and action of a nation will be the peculiar manners and customs distinguishing it from every other. Thus an empire resembles an individual, who acquires his character and peculiarities from those who nurture and instruct him; and despise as we may the inconsistencies of a foreign nation, they are just what we ourselves would, in similar circumstances, have acquired; and if they cannot call forth our respect, they should never excite our disdain. (234)

The Americans and others who recorded their experiences were captains, ship owners, naturalists, officers, and even common seamen. Their expeditions were frequently directly commercial voyages, involving ships with several owners and
large sums invested in trade goods. The risks were great, but for the owners profits were equally great, and hence they often reinvested in more ships and more voyages. In their interaction with cultures not yet part of the world-system, traders were specifically interested in creating a dependency upon foreign produced goods, so that a permanent need for manufactured articles could be created. Inevitably, this often helped to alter the mode of production of indigenous cultures, as it did in the case of Hawai'i.

Along with their trade goods the Americans and other westerners brought to Hawai'i their contradictory concepts of land and ocean resources. Hawaiians, as described in chapter three, possessed a system of group-property tenure (the ahupua'a system) which restricted access to land and sea alike. Americans believed in individual land tenure, but held that the ocean was a common-property natural resource. Nobody could own the ocean or the animals that lived in it, nor could anyone acquire exclusive rights to use it.

Ocean resources could therefore be taken freely by whoever had the capital to do so, a situation which obviously encouraged individual competition. It was an attitude which did not (and does not) lend itself to concern with preservation of the oceans natural resources. Fishermen, whalers, seal hunters etc. were inclined to take
as much as they could, since if they did not, someone else most certainly would (Gordon 135).

Up until the twentieth century, there appeared in most areas to be fish enough for all. Westerners had no concept that human activities could deplete the population. The 19th century English biologist T. H. Huxley presented scientific support for a commonly held view on the part of his contemporaries when he said: "I believe that probably all the great sea fisheries are inexhaustible; that is to say, nothing we do seriously affects the number of fish" (qtd. in Johannes, "Traditional Marine Conservation" 350). Hawaiians and other Polynesians, dependent on limited marine ecosystems, knew better.

However, by the 18th century Americans were well aware that certain species of marine animals were capable of depletion and even extinction due to human exploitation. Whales, fur seals, walrus, and sea otters began to vanish from the Atlantic, and that more than any other factor brought Americans into the Pacific, as described in chapter two. Committed to the idea that access to ocean resources could not be restricted, Americans epitomized the practice of taking everything that could be taken. Americans also frequently had the same attitude toward land resources held by indigenous cultures under systems of group tenure. Sandalwood was one example. The concept of ocean resources as common property to be exploited under a system of
individualistic competition was the total antithesis of the traditional Hawaiian system of limiting access to ocean resources, and hence conserving them.

Up to 1819, the impact of America upon the Hawaiian maritime mode of production was largely indirect. That does not mean the impact was negligible, since the mode of production changed from a kinship mode to a tributary mode during this time. Related to that change, the concept of group tenure of particular ocean areas began to break down. Hawaiians did not give up fishing during this period, or resort to primarily commercial fishing, or abandon traditional fishing methods. Yet certain aspects of the technology and intellectual base of fishing did change, and everything connected to the social relations of maritime production changed.

POLITICAL AND DEMOGRAPHIC BACKGROUND

The changes which occurred in the maritime mode of production to 1819 can not be understood except against the background of the political and demographic events. The political events document the actual sequence of state development, which operated to change the social relations of production. All evidence indicates that the change to a political state took place during a time of gradual, and ultimately rapid, population decline. This demographic fact was also significant with regard to the maritime mode of production.
The general outline of the political events in Hawai'i after 1778 is well known, and the best general summary available is still Kuykendall's *The Hawaiian Kingdom*. In 1778 the islands were divided into four chiefdoms, although as noted earlier there was nothing particularly stable about this arrangement. The largest chiefdom was that of Kalaniopu'u, the *ali'i nui* of Hawai'i. Kalaniopu'u in his lifetime had made several attempts to conquer Maui, and during the time of Cook's visit was in control of the Hana district in eastern Maui. Within the next two or three years, he lost Hana to Kahekili, the *ali'i nui* of Maui, Molokai'i, Lāna'i, and Kaho'olawe. The third chiefdom was that of O'ahu, and the fourth included the two leeward islands of Kaua'i and Ni'ihau.

After Cook's visit in 1778-1779, no western ships came until either 1785 or 1786. In 1786, three different western expeditions apparently visited the islands. They included the French exploring expedition under Jean La Perouse and two British commercial ventures. The first, sent out from England, included two ships under the command of Captains Dixon and Portlock. The second expedition was outfitted in China, due to "the commercial zeal of British subjects in that part of the globe" and was under the command of John Meares (vi).

These ships, not unexpectedly, found a very different political situation from that which had existed in 1778.
Shortly after losing Hana to Kahekili, Kalaniopu'u died, probably in 1782. Kalaniopu'u had appointed his son Kiwalao as his successor, and had given the custody of the war god to his nephew Kamehameha. Before the end of 1782, Kamehameha and his ali'i allies had killed Kiwalao in battle, and the island of Hawai'i was divided into three chiefdoms. Kamehameha had gained control only of the districts of Kona, Kohala, and part of Hamakua. In 1785 Kamehameha tried unsuccessfully to unite the island of Hawai'i, and Kahekili successfully conquered O'ahu. In 1786 Kahekili resisted Kamehameha's attempts to gain control of Maui's Hana district (Kuykendall 32-34). These wars represented the continuation of the Hawaiian pattern of competing ali'i, and had nothing to do with western contact. From the beginning however, the ali'i were interested in the possible ways westerners could be used to further their own interests.

Western ships continued to visit every year after 1786. In 1790 Kamehameha gained the assistance of two British seamen, one from the capture of a small American schooner by another ali'i, and the second detained from the American trader Eleanora. These two men, Issac Davis and John Young, were also to assist western visitors as interpreters of Hawaiian language and culture.

Meanwhile, the political scene remained active and unstable. Kamehameha conquered Maui and its tributary
islands in 1790, and in the same year tried unsuccessfully to unite the island of Hawai'i under his rule. Kahekili, assisted by the Kaua'i paramount chief, reconquered Maui and attacked Hawai'i. Kamehameha, assisted by Young and Davis and cannon mounted on double canoes, repulsed the invasion in early 1791. Later that same year, Kamehameha at last successfully united the island of Hawai'i.

In the years 1792, 1793 and 1794 the most noted visitor to the islands was the British exploring expedition under George Vancouver. All the ali'i, particularly Kamehameha, were interested in obtaining any material goods, skilled workers, or advice which appeared potentially useful to them. Like most westerners Vancouver was particularly free with advice, and his role in shaping subsequent political events in Hawai'i has been much debated.

The American trader Amasa Delano visited Hawai'i in 1801, and found Kamehameha in control of all but Kaua'i. According to Delano

Great credit is due to captain George Vancouver for his success in bringing all the islands under the subjection of Tamahammaha [Kamehameha], as well as for his friendly treatment of the Americans and Europeans. The king never had thought of such a policy, till he was instructed and assisted in it by this man ... A circumstance that is very generally known in the world.

(Delano 399)

Turnbull, visiting at about the same time, did not share Delano's enthusiasm and regreted Vancouver's encouragement and assistance in unification, since it had made
Kamehameha "a conqueror and usurper" (2: 53). Nonetheless, Vancouver was held responsible for the unification.

Anthropologist Marion Kelly has argued that Vancouver did indeed urge Kamehameha to transform his government from a chieftainship to a kingship, and gave him precise models of how such a political state could be structured:

My contentions are that the resemblences to European feudalism...[under Kamehameha I, II, and III] were familiar mainly because Western feudal forms had been used as the patterns after which Kamehameha I designed his particular form of government; that much of Kamehameha's government was structured according to descriptions provided him by agents of Western culture; and further, that Captain George Vancouver was perhaps the most resourceful and most important single figure among them. ("Some Problems" 402)

Enough has already been said about political events in the prehistoric and early historic period to indicate that Kamehameha probably needed no help to think of "such a policy" as interisland conquest and unification. Vancouver's own account makes it quite clear that he repeatedly urged Kamehameha (and the ali'i on other islands) to abandon their ambitions of interisland conquest and to be content with their existing territory (e.g. 2: 155-56, 158, 180-182; 3: 49-50). He refused to trade for guns, ammunition, or powder (e.g. 1: 179; 2: 190). That Vancouver consistently advised against any military unification is substantiated by the accounts of those who sailed with him: Menzies, Bell and Manby.
As will be discussed in the next section, the ali'i during this period also became in a sense "agents of Western culture" themselves. They did so from motives which were simultaneously economic and political, and in their own way the ali'i were as opportunistic as any American trader. If ali'i had not become cooperative partners in the process of change, no advice (whatever it actually was) from Vancouver or any other westerner would have been significant. Given the probable structure of Hawaiian government prior to Vancouver's visit, Kelly may well have given Vancouver too much credit for what happened next.

Political events subsequent to Vancouver's visits are quite clear. On the third visit, in 1794, Kamehameha made his famous (and politically somewhat meaningless) cession of Hawai'i to England. The following year, Kamehameha took advantage of the political instability caused by the death of Kahekili to conquer both Maui and the island of O'ahu. If nothing else, this is a striking example of the unimportance of any westerner's opinion if it did not coincide with ali'i goals.

Kamehameha began immediately to prepare for the invasion of Kaua'i, but his first attempt in 1796 was defeated by adverse weather. Later that same year he was forced to return to Hawai'i to suppress a rebellion, and he remained there for the next several years building a new fleet of special double canoes and western schooners.
Kamehameha also acquired western ships, guns, ammunition and other supplies for the Kaua'i invasion. The Kaua'i paramount, Kaumualii, was preparing in much the same way for the same event. By 1803 Kamehameha was back on O'ahu and prepared to launch his attack, when a large percentage of his army died in an epidemic. Kamehameha remained committed to the goal of unification and in 1810 an American trader helped mediate an agreement with Kaumualii. Kaua'i became a tributary state under Kamehameha (Kuykendall 47-50). Shortly after this achievement, Kamehameha returned to the Kona district on the island of Hawai'i, where he continued to live until his death in 1819.

From 1795 to 1819, contact with foreign countries was predominantly with America, but there were still significant visits from other countries. England remained officially interested in Hawai'i, and Russia also sent several scientific expeditions which visited Hawai'i. Hawai'i figured in certain events involving the competition for the northwest coast and California fur trade between England, Russia, and the United States. In 1811 and 1812, ships sent out by John Jacob Astor to found a fur trading settlement on the Columbia River stopped to provision and to recruit Hawaiians for work in the northwest (Ross; Cox). Astor's effort was a reflection of the dwindling supply of sea otter and the consequent necessity of obtaining land mammal furs further inland. England
ultimately took over the settlement of Astoria during the War of 1812. Also in 1812 the Russian American Company successfully built its southern outpost of Fort Ross in California. A short time later, Company representatives (although not the Russian government) considered the possibility of acquiring parts of Hawai'i. The German Georg Scheffer, on behalf of the Russian American Company, acquired among other things exclusive sandalwood privileges on Kaua'i from Kaumualii. However, after constructing a fort at Waimea on Kaua'i, Scheffer was forced to leave (Kuykendall 56-59).

By 1819 Kamehameha and his ali'i supporters had not only unified the islands but resisted more than one internal and external threat to their authority. They had restructured the government and gained the tolerance of foreign governments who traded in Hawai'i. They had also, as will be discussed in more detail, completely transformed the mode of production as part of the creation of a state form of government. Incredibly, these events took place during a time of population decline.

The rate and causes of that decline are another much-debated topic in Hawaiian history, but the reality of the decline is unquestioned. Demographer Robert Schmitt, who has studied the question extensively, has concluded that "Nobody knows what the population of Hawaii was when Captain James Cook first stepped ashore in January 1778" ("New
Estimates" 237). In his 1968 study, Schmitt accepted a figure of 300,000 as being a reasonable compromise of the various estimates provided by Cook's officers. The island of Hawai'i contained almost half the total, followed in order by Maui, O'ahu, and Kaua'i, Moloka'i, Lāna'i and Ni'ihau. Kaho'olawe was described as unoccupied (Demographic Statistics 42).

In 1971, Schmitt revised this estimate downwards, apparently because he now believed a declining birth rate, rather than a significantly increased death rate, was the major factor in the decline. He placed the population of the islands in 1778 as between 200,000-250,000 people ("New Estimates" 240). Prior to 1819, only one other estimate was cited by Schmitt. That estimate was for the year 1805, when total population was approximately 264,000; even if this estimate is revised downward slightly, it would indicate a very gradual decrease between 1778 and 1805, rather than the steep decline indicated by his 1968 estimate (Demographic Statistics 42).

The next population estimate utilized by Schmitt is that done by the missionaries soon after their arrival. In 1823 they estimated the population at about 135,000 for all the islands (Demographic Statistics 42). The total population around 1819 may thus have been about 150,000. If the total number in 1778 was close to 300,000 then population
had declined by about 50 percent; if the figure was originally about 200,000 the decrease was 25 percent.

Many hypotheses have been offered to account for the population decrease. Introduced diseases leading to an increased death rate, a pattern certainly documented in other areas of western contact, was clearly one factor. The Hawaiians were one of the most biologically isolated of peoples, separated from the rest of Polynesia for perhaps as much as 1,500 years. Polynesia as a whole had perhaps been separated from contact with any continent for over twice that long. There had been no opportunity for immunity to the more contagious diseases to evolve in Hawai'i.

Schmitt, however, does not consider introduced diseases and epidemics to have significantly increased the death rate ("New Estimates" 239). The only major epidemic to occur prior to 1820 was the one of 1804 which prevented Kamehameha's planned invasion of Kaua'i. The disease has been identified as cholera, and Schmitt estimated that somewhere between 5,000 to a maximum of 15,000 died in this epidemic. This ranks it as one of the three worst epidemics in Hawaiian history, the other two taking place in 1848 and 1853 ("The Okuu" 362-63).

Death due to famine is another factor which itt has analyzed. He focused on "full-scale famine," and concluded that it was a "minor factor in Hawaiian depopulation" ("Famine Mortality" 109,115). Natural famines and those
caused by warfare described in the historical record were local occurrences, and people simply moved elsewhere. However, Schmitt did not analyze the effect of "prolonged hunger falling short of starvation." He noted that "conditions of hunger short of famine were common in Hawaii in the 18th and 19th centuries. Deprivation of this kind presumably affected Hawaiian mortality patterns...", but sufficient evidence was lacking for Schmitt to evaluate its significance ("Famine Mortality" 109).

Basically Schmitt concluded that Hawai'i had a high death rate naturally, and that epidemics, warfare, human sacrifice, and natural disasters like famine were relatively unimportant in increasing the death rate ("New Estimates" 239). More important to population decrease was the decline in the birth rate, which began prior to 1819 and intensified in the period before 1850. Presumably the decline in fertility might have been related to an increase in malnourishment, although Schmitt did not say so directly. According to Schmitt, significant factors in the declining birthrate were fetal death caused by syphilis (introduced by Cook's crew) and sterility from gonorrhea (also introduced), as well as a presumed increase in induced abortions. Other important factors in the population decline included high infant mortality (again in part due to introduced diseases), a presumed increase in infanticide, and emigration ("New Estimates" 239).
Another analyst, Irene Taeuber, believed that part of the decrease was due to the "social disorganization and individual demoralization" that resulted from factors such as alcoholism, tabu abolition, and what is called here the transformation of the mode of production. In Taeuber's opinion, the "population-resources relations" were "balanced precariously" at contact. "The early diversions of activity from local to market production resulted in the main in a conspicuous consumption among the elite." The resulting social disorganization was a contributing cause to population decline (98-99). Taeuber's theory is an attractive one for this research, but probably impossible to prove. As will be discussed, however, the changes in the maritime mode of production, particularly the social relations of production, were of a magnitude to be termed social disorganization.

The population decline ultimately helped to cause some significant changes in the maritime mode of production. Taeuber hypothesized that population decline was also part of the effect of such changes. Both ideas will be considered in the remainder of this chapter, and in the following one.

THE ALI'I: AGENTS OF THE CAPITALIST WORLD-SYSTEM

"No strangers were ever more hospitably received."

That was John Rickman's description of the Cook's reception at Kealakekua Bay on their second visit to the Islands
(299). While violence certainly did occur between the Hawaiians and their foreign visitors, Rickman's statement characterizes the basic relationship between the two groups. It is interesting to consider what might have happened to the Pacific northwest fur trade had Hawaiians consistently met foreign ships with the armed hostility characteristic of some other Pacific Islanders. The foreigners possessed muskets and cannon, yet certain islands in the Pacific were avoided for decades because of the danger involved (Howe). It is true Polynesian custom required courtesy toward visitors; yet it also appears to be true that the ali'i worked hard to maintain good relations with the foreigners because they immediately saw it as a policy which was to their own advantage.

Iron was the item initially in demand, as always in a culture where critical tools were manufactured, with great labor, from relatively limited quantities of suitable stone or from bone. When Cook initially anchored off Kaua'i he was presented with food by people who did not necessarily expect any immediate return, and who took anything offered. Later, however, the Hawaiians understood that the foreigners were interested in trade, and their policy changed quickly. Cook wrote while approaching Kealakekua that the Hawaiians "understand trading as well as most people ... they bring off things in great plenty, particularly pigs, yet they keep
up their price and rather than dispose of them for less than they demand will take them a shore again" (Beaglehole 1: 483).

Initially people tended to accept small iron nails in exchange for hogs, but almost immediately nails became relatively inexpensive items. At Kealakekua Samwell recorded that

> These people are so eager after our Iron that they pick the Sheathing Nails out of the Ship's bottom, & our Men pull as many as they can conveniently on the inside to give to the Girls, so that between them both was there not a strict Eye kept over them we should have the ship pulled to pieces at this place. (Beaglehole 2: 1164)

Although Cook's ships were able to use almost any item in trade, from metal buttons to glass bowls, the most popular items were iron adzes and daggers, both shaped by the ships' armorers to local specifications. The daggers were described as "about two feet and a half long, in [the] form of the their own wooden ones and made by the armourer for that purpose..." (Gilbert 101). Adzes were usually made by sharpening pieces of old barrel hoop, and before the expedition left Kealakekua Samwell believed that iron adzes had come into "universal use" (Beaglehole 2: 1186).

Ultimately, Samwell noted that "all the large Hogs they bring us now they want Daggers for and tell us that they must be made as long (as) their arms, & the armourers are employed in making them insted of small adzes" (Beaglehole 2: 1190). When the ships went to Kaua'i after Cook's death
they found the same preference for the daggers, and Captain Clerke gave orders that "no more iron Daggers should be sold to the Indians" (Beaglehole 2: 1225).

This is one indication that the trade was already dominated by the ali'i; who had the major access to primarily ritual items like hogs. Adzes could be particularly utilized by chiefs to support their canoe-makers, and daggers were of value for warfare. Before the expedition left Kealakekua Bay Lt. King noted that one of the ali'i gave to the "king" (Kalaniopu'u) much of the iron that had been received in trade (Beaglehole 1: 518).

From the very beginning the ali'i were interested in acquiring metal working skills themselves, and in obtaining foreigners as part of their personal entourage. Surgeon Ellis noted that

[M]any of the Indians had been, both now and before, very attentive to the armourer whilst at work, and took particular notice of the tongs and chissels which he made use of, with his mode of using them; and finding that they were so essentially necessary in the forming the different iron-work, they ... were fully persuaded, if they were but once possessed of them, they also could work as well as we. (102-103)

The English believed that an ali'i ordered the theft of both the tongs and the chisel, which later were recovered. Even without these items the Hawaiians attempted to fashion the iron themselves: "They are the only Indians we met with that ever attempted to work it [iron] themselves into different forms agreeable to their own fancy; which from
seeing our armorers onboard they accomplished neater than could possibly be imagined by heating and beating it with a stone" (Gilbert 126).

From the beginning the major chiefs were interested in obtaining foreigners to assist them in battles. When the ships returned to Kaua'i after Cook's death, a power struggle was occurring between the ali'i. Captain Clerke wrote: "They have been making many large offers & fair promises to some of my People to induce them to run away and assist them in their Battles..." (Beaglehole 2: 578).

The ali'i had set the pattern for trade with the foreigners, but almost ten years were to pass before ships returned. Once this happened the ambitions and interests of the paramount chiefs gradually came to dominate the trade. Even in 1786 some British were reluctant to trade for weapons of war. Portlock did not allow any daggers to be made in either of his ships, since he was of the opinion that Cook had been far too short-sighted in permitting their manufacture. Instead, the ali'i had to settle for iron hoop worked into adzes (78).

Most of the adzes and other items obtained in trade by the commoners ended up with the ali'i. While on O'ahu, Dixon noted that the paramount chief was building a new house, which he used to store his European goods. In addition, the chief commanded the commoners to bring all European items they had obtained, and took half for himself.
According to Dixon one of the Hawaiian priests thought that this was "contrary to the rules of justice and equity" (106).

Portlock apparently received the entire Makahiki collection on Kaua'i in January 1787. He noted that people brought in their contributions cheerfully: "...some brought hogs, others taro, bread-fruit, and indeed every thing the island produced; all of which were placed in separate heaps" (178). The Kaua'i ali'i nui divided the contributions into two large piles, and one was given to each ship. Although Portlock does not say what he gave in return for this "present," it is highly unlikely that very much of it was redistributed to commoners. Shortly thereafter, it became difficult to purchase more hogs and the ships went to Ni'ihau. When they returned to Kaua'i they received the proceeds of another "tax," although perhaps it was simply a continuation of the Makahiki collection (Portlock 193).

Meares, back in Hawai'i in late 1788, was one of the first Captains to deal with Kamehameha. One of Meares ships was the schooner *North West America*, built on that coast. Kamehameha immediately saw the practical value to himself of such a ship, and "entreated that a carpenter might be left at Owhyhee" to build a similar one (1: 338).

One of Meares ships, commanded by Captain Douglas, returned to the island of Hawai'i early the next year after problems in obtaining supplies on Kaua'i and O'ahu.
Kamehameha told Douglas that the Kaua'i paramount had been
given guns and ammunition by Portlock and Dixon on condition
that no supplies be granted to Meares' ships.

This speech ... concluded with entreating Captain
Douglas to leave two of his men behind him, till
his return from America, together with a swivel
gun, his own fowling piece, and whatever other
arms and ammunition could be spared by him.
The preparations which Captain Douglas had
seen at other islands, and the great demand he
had experienced for powder, shot, and muskets,
induced him to give some credit to the scheme
[that Kamehameha was about to be attacked by the
other islands] ... he therefore, complied with
that part of the request which related to the
fire-arms, and immediately ordered the carpenter
on shore, to form a stage on one of the largest
double canoes, to receive the swivel. (Meares
1: 354)

Kamehameha then "dispatched messengers up the country,
with orders for everyone who had a hog to bring it
immediately to the village, on pain of death ...." All the
hogs (about 50) were given to the ship. Douglas left after
giving a return present of additional arms and ammunition
(Meares 1: 355).

The British Captain James Colnett found on Kaua'i in
1788 that commoners were forbidden to sell hogs, and could
only trade for vegetables, fish, wood, salt, and water
(Prince of Wales 169). Colnett shared another experience
with Portlock, Dixon, and Meares: the ships' anchors,
deliberately cut (or at least so the captains all believed)
were subsequently raised by the Hawaiians. In Colnett's
case for the return of his anchor he gave the Kaua'i
paramount "5 half bars of Iron ... Two Muskets, two pistols [and] Ball ... a Powder Horn of Powder ... 20 Rounds of Musket & Pistol Ball each ... A Coopers Beak Iron & A cross Cutt Saw ... Double headed Maul & Ship's speaking Trumpet" *(Prince of Wales 176)*. The fact that bar iron was a suitable item indicated that the Hawaiians were able to adequately work the iron for themselves. The Kaua'i chief also told Colnett that he would soon be invaded from O'ahu, and wanted the Englishman to leave some men to help resist the invasion. Colnett did not do so but did teach the use of muskets *(177)*.

Although commoners continued to trade for all types of artifacts, including nails, the *ali'i* primarily controlled the hog trade and frequently obtained items related to warfare. In 1789 George Mortimer (on board the British trader *Mercury*) noted that Kamehameha was "continually teasing us for guns and gunpowder, especially the latter article..." *(53)*. Mortimer apparently obliged, even though he considered Kamehameha to already be well supplied. At Kealakekua Bay Kamehameha had "two two-pounders [small cannon firing a two pound ball] and two swivels mounted before his house on a raised platform of stone; the two-pounders have proper carriages, and the swivels with pieces of cloth tied round them, and the ramrods, and spunges laid in order at their sides ... have quite a martial appearance" *(52)*.
By 1791 arms and ammunition were common articles of trade. Three visitors to the Islands in that year traded extensively (though by no means exclusively) in items of war. The American Ingraham, the Spaniard Quimper (Minson) and Colnett (Argonaut) all report on the intensity of the arms trade. Colnett in particular, anxious to discredit Spain in the eyes of the Hawaiians, recorded at Kealakekua Bay:

By a little well timed liberality, I wiped out every impression of their [Spanish] superiority that had been imbibed by them ... and by a Present of a three Pound swivel, a few muquetes [muskets], and two or three Blunderbusses, I stood well with the great... (Argonaut 220)

Colnett also provided Kamehameha with quantities of powder. Later when he visited Kaua'i he provided the chiefs there with arms, powder, shot, and ammunition, just in case the Spaniards gave them problems (Argonaut 223).

During the years of Vancouver's visits (1792-94) an increasing number of fur traders used guns and ammunition as an important item of exchange. On the island of Hawai'i Kamehameha had prohibited trade except for guns, and Vancouver noted that this was the fault of "the injudicious conduct of unrestrained commercial adventurers..." (2: 110). Often the guns provided burst upon being fired and the gun powder was mixed with salt or charcoal (3: 30).

Vancouver refused to trade for firearms and found that red and blue cloth as well as iron and printed linens were
accepted as soon as the ali'i were convinced of that fact (2: 7). By the next year, however, Bell saw thirty muskets in Kamehameha's house, most of which had just been received in trade (78). At Lahaina one fur trader had left "a number of Muskets, a very large quantity of Powder, and two pieces of Cannon (4 pounders)...." and had received all necessary provisions from O'ahu and Kaua'i in return. While the ali'i at Lahaina still wanted ammunition and firearms, they also tried to get carpentry tools from Vancouver's ships, probably to speed up the building of large war canoes (Bell 89).

The demand for firearms went on. When the ships arrived in Kaua'i in 1793, they learned that hogs had been tabued to reserve them for Vancouver; however, when traders with firearms got there first the hogs were exchanged (Vancouver 2: 222). By 1794 a visit from the American ship Lady Washington had provided Kamehameha with more swivels, muskets, and gun powder (Bell 83). Some historians (for instance Howe) have taken the position that guns and cannon were actually not useful in Polynesian warfare and had little if any effect on the outcome. Clearly the Hawaiian ali'i, who had already had ample opportunity to test foreign weapons under battlefield conditions, did not agree.

Vancouver tried to convince Kamehameha (and ali'i on other islands) to give up their ideas of conquest. He noted angrily that traders were encouraging warfare in order to
maintain the profitable trade in firearms (2: 190). Vancouver himself, however, left "sky rockets" and "hand grenades" for Kamehameha's protection in case of invasion or rebellion. In addition, he greatly assisted Kamehameha in developing a large navy which included western ships.

When Vancouver arrived in Kealakekua Bay in 1794 Kamehameha was prepared to start work on a western-style schooner, with the assistance of a shipwright left by the Lady Washington. Vancouver ordered the ships' carpenters to help, and in addition provided all the iron work, oakum and pitch for caulking, masts, a set of schooner sails, extra canvas, and the needles and twine necessary for repairs (Vancouver 3: 18,52). With carpentry tools and training provided by Vancouver, Kamehameha's western shipyards began successfully.

Clearly by this time the ali'i, while conscientiously using the foreigners to pursue their own end, had as a result entered into a dependency relationship which had internally began to change the mode of production. Powder and shot, additional guns and replacements could only be obtained by cooperative trade with the foreigners. In addition, metal had began to supplant stone as the material for essential tools such as adzes. One of Vancouver's officers noted that the Hawaiians

[A]re now so well acquainted with the great superiority of our Metal implements & working Tools--as not to be able to do without them, for
at this time, a stone Hatchet [adze], or a Shark's tooth Knife is as rare a thing among them, as an Iron Axe, or a pair of Ecissors [scissors] was twenty years ago. (Bell 63)

Because the dependency on metal tools was already in existence, Bell believed that there was no necessity for traders to provide firearms. He noted that the presence of the foreign ships gave hogs a market value they otherwise did not possess, and the dependency on iron implements ultimately would force the chiefs to use that value (63).

The ali'i, particularly paramount chiefs, continued to use their rights of appropriation to monopolize the trade in hogs. Bell provided evidence as to the state of the traditional system of reciprocal obligation between ali'i and maka'ainana in the early 1790s.

Iron seem'd but of very little value with the Chiefs some of them would not even look at an Axe, that about three or four years ago would have purchased half their property,--Many of them told us they had more Iron than they knew what to do with,--though in this I do not believe them, as the Common people most eagerly took all kinds of Metal,--particularly Iron in exchange for their Vegetables and other articles they had to dispose of. (Bell 62-3)

It is probable that the ali'i had accurately stated the situation: they had enough iron (and the craftsmen to work it), from their own trade and from appropriating iron from commoners. The latter, however, still possessed few iron artifacts.

In at least one instance, an ali'i attempted to sell surplus western goods to Vancouver's sailors. Bell noted
that "natives" came on board several times to sell a variety of articles, including sea otter skins from the Pacific northwest. The other articles were "Jackets, waist coats, satin & Nankeen Breeches ... [also] knives and forks, Tin pots, [and] Kettles..." (81). It was Bell's opinion that these goods had not been obtained in trade, but were either stolen off other ships (much earlier, as Kamehameha now prevented theft) or acquired from the capture of the Fair American in 1790. Regardless of how obtained (and trade appears the most likely explanation) they were almost certainly in the possession of ali'i, and the native salesmen were acting on behalf of their chiefs.

All the ali'i, particularly ali'i nui, manipulated their traditional appropriational powers to control trade. However, Kamehameha was in a rather fortuitous position with regard to the foreign trade, since three of the very few possible harbors on the island of Hawai'i (Kealakekua Bay, Kailua, and Kawaihae) were under his control. In addition, the Kona district was the largest hog producer on the island. Kamehameha's rivals found it difficult to trade with the foreigners as a result. Kamehameha also was the beneficiary of the tendency of many of the early visitors to follow Cook's route through the islands, with the Kona coast of Hawai'i and Waimea on Kaua'i the primary provisioning sites. Other favorite, though secondary harbors were those at Lahaina and off Waikiki. After the discovery of Honolulu
harbor in 1794, it too became a favorite destination. However, since discovery was followed closely by Kamehameha's conquest of O'ahu, it did not lead to any advantage for O'ahu ali'i.

In 1795 Kamehameha united all the islands except Kaua'i. His interest in trade with the foreigners continued to center on iron and arms, with an increasing emphasis on naval stores and western ships. Charles Bishop found Kamehameha at Waikiki in 1796, and in complete control of O'ahu's hog market. Bishop obtained hogs in exchange for gunpowder (one medium-sized animal for a quart of powder), and noted that the king was attended by a guard of thirty men with muskets and fixed bayonets. Bishop learned that the invasion fleet included a western schooner with twelve 3-6 pounders, and also saw two new ships (one of 45 tons, the second of 30 tons) nearing completion on the beach (181).

Kamehameha returned to Hawai'i shortly thereafter, to suppress a rebellion and prepare seriously for the invasion of Kaua'i. It seems clear that in his mind the success of the invasion depended on foreign cooperation in providing necessary western goods, particularly ships. In 1798 Ebenezer Townsend, Jr., a sealer from New Haven, visited the naval yard at Kawaihae. In addition to many large double canoes he found men building a 60 ton schooner, and noted that Kamehameha had blacksmiths, carpenters, and a forge in
the shipyards (24). The king obtained pitch, a large pitch kettle, canvas, and food items such as rice and flour in return for hogs.

A Russian exploring expedition visited Hawai'i in 1804, the same year as the epidemic on O'ahu. Captain Urey Lisiansky visited Kealakekua and was told (by Young) that Kamehameha's navy now included about twenty schooners, armed in part with forty swivel guns. In addition, the king owned fourteen cannon (3-6 pounders), six mortars, six hundred muskets, and "a sufficiency" of powder, shot and ball (133). Most of the arms and ammunition had been "supplied by the ships of the United States" and as a result "these articles in the island of Owyhee have greatly sunk in value" (116). By the time of Lisiansky's visit, America had been dominant in the northwest fur trade for ten years, and was the major supplier of all western goods.

Lisiansky had difficulty purchasing adequate supplies, primarily because the Americans had saturated the market with regard to certain items.

Everything at present is dear, on account of the many American ships, which in navigating these seas, always touch at the Islands for refreshments. In the course of a twelvemonth, the bay of Caracacooa [Kealakekua] has been visited by no less than eighteen different vessels. (125)

Provisioning ships had obviously become part of the lifestyle of many Hawaiians, and as a result even commoners were uninterested in the iron hoop (for adzes) and other
iron artifacts Lisiansky had stocked. Hogs, by order of Kamehameha, could be purchased only for iron bars or canvas, and Lisiansky could obtain few. Clothes and material of all kind proved his best trade item: "We parted here with all our rags, in exchange for provisions..." (125).

In the first decade of the 19th century, the dependency of the ali'i on foreign products, and their internal manipulation of the productive system, increased. The sandalwood trade had begun, foreign goods were stockpiled by the ali'i in western style stone storehouses, and specie (primarily Spanish silver dollars or piasters) came into use, most of it apparently destined for Kamehameha's treasury.

The American seaman Samuel Patterson recorded that Hawaiian commoners on the island of Hawai'i requested silver dollars for providing dinner after he and several companions were "discharged" from their ship in 1805 (66). Later, on O'ahu, Patterson "purchased" about sixty acres of land, including fishponds, from Kamehameha (7). Fellow American Issac Iselin similarly recorded the demand in 1807 for "Specie, say Spanish dollars," since "the natives are over­stocked with all kinds of commodities..." (69). Iselin thought it probable that most of the specie ended up in the hands of the king. He was told that Kamehameha "has horded up $10,000 in specie, which he knows well enough to employ
for obtaining, through the American traders, what articles he stands in need of" (78).

It is difficult to determine to what extent this is an exaggeration, but references to the use of specie continue. Archibald Campbell, a British sailor who had lost his feet to frostbite in the Aleutians, lived in the islands for thirteen months in 1809-1810. He also believed that Kamehameha had "amassed a considerable treasure in dollars, and ... a large stock of European articles of every description ..." (153). Eight years later the Russian ship visited under V. M. Golovnin. By this time Kamehameha's treasury had grown, in story or in fact, to 200 thousand piasters kept "in strong boxes in stone houses built for this purpose" (196).

Since Golovnin's ship did not carry trade goods, he was forced to buy supplies with piasters. He found that specie was quite acceptable, but considered the prices to be extremely inflated due to the Hawaiian trade with the Americans. He described the process as follows:

The Americans,... who constantly trade in these waters, bring great amounts of various European knickknacks, usually trying to select something the islanders have not yet seen. They use these articles as payment for everything they buy, often quoting prices in piasters. They will frequently give a Sandwich Islander some trifle costing half a piaster in exchange for a pig, but will quote it at seven or eight piasters. The islander takes the object, not knowing its real value, merely because he likes it and considers it worth a pig; however, when another islander brings a similar pig to a warship that does not have
trade goods to pay him with, he will also demand seven or eight piasters for it in order to be able to buy from an American trader an article similar to the one bought by his friend. Today a warship in need of a large quantity of supplies will make a big mistake in going to the Sandwich Islands to replenish its provisions. (204)

Kamehameha's navy and armaments also continued to grow. In 1805 he acquired a ship of about 175 tons burden, the Lelia Byrd, from the American William Shaler. In return Shaler had his choice of all Kamehameha's ships. According to Shaler, the king at that time had around thirty western ships of from twenty to sixty tons burden, and Shaler chose a schooner of about forty-five tons recently completed by Kamehameha's carpenters (84-90). At the time of the exchange of ships, Shaler had just returned from collecting furs off California, and he was afraid the Lelia Byrd would sink at any time. The ship was repaired however, and subsequently leased to foreigners to ferry furs to Canton.

In addition to purchasing foreign-built ships which were subsequently leased to other foreigners, Kamehameha also found it profitable to lease out his locally built schooners. In 1807 Iselin noted the return of one of the king's ships from her second trip to the California coast, carrying some 3,000 otter skins and approximately $10,000 in specie. The ship had been leased to a group of Americans on O'ahu, and later was sold by the king to the Russian American Fur Company (Iselin 79).
Kamehameha's interest in building and buying western ships continued unabated after Kaua'i was added to his rule in 1810. The discovery of sandalwood in Hawai'i gave him the resource which made purchases easier, and before his death he had traded sandalwood for at least six vessels (Bradley 56).

In some instances, Kamehameha refused to sell sandalwood for anything less than a ship. In 1816 Samuel Hill, out of Boston on the Orphelia, attempted to purchase sandalwood from Kamehameha with Spanish silver dollars. The king however refused, in part because the Americans to whom he had leased the Lelia Byrd had not returned with her from Canton. Hill reported that Kamehameha "would talk of nothing but a brig or schooner in exchange for sandalwood." Since Hill had no authority to sell the ship, he sailed to Kaua'i to try to buy sandalwood. However, Kamaulii also "seemed indifferent to any kind of barter for sandalwood except for a brig or schooner of 180 or 200 tons burthen [burden]." Hill was forced to abandon the purchase of sandalwood, and returned to Kailua where Kamehameha agreed to provision the ship in return for pine planks, miscellaneous items, and passage for thirty people to O'ahu (365-66).

Certainly one reason for Kamehameha's continued interest in western ships was a desire to engage in the sandalwood trade on his own account rather than having to
rely on the American traders. Peter Corney saw the first effort in early 1817, where Kamehameha's brig *Kaahumanu* (formerly the *Forester*) was loaded with sandalwood and sent to Canton with an American captain and a crew of twenty, half of them Hawaiian. The brig had returned by the end of the year, and when Corney's ship the *Columbia* visited Honolulu harbor in 1818, they had to pay an $80 harbor fee, instituted by Kamehamea after the *Kaahumanu* paid similar fees at Wampo (Corney 192).

The *Columbia*, a ship of about 200 tons burden, was sold to Kamehameha for "twice the full of the vessel of sandal wood for her, to be delivered in a space of time not exceeding six months ..." (Corney 180). The sale was made in Honolulu (via John Young) and while the sandalwood was being gathered, the ship was sent to Kailua with the Makahiki taxes and some 400 Hawaiians as passengers. At Kailua, the ship began to fire a salute to the king, but he "called out to us, in a pleasant tone, to stop, as the powder was now his, and he wanted it for other purposes ..." (Corney 181). Soon after, the ship's large guns were taken off and placed in front of the king's house. Ultimately, after more service in transporting the king's taxes, the ship picked up its two loads of sandalwood on Kaua'i and O'ahu and was turned over to the Hawaiians. This account, by no means an isolated one, indicates another use for the
large western ships: safely transporting large quantities of goods and numbers of people interisland.

Kamehameha continued to construct his own western ships at more than one location. At Kawaihae in 1816 Charles Barnard saw ten vessels, of 30-70 tons, "laid up in ordinary, with their cannon, stores, and apparatus deposited here...." He also saw one of 20 tons under construction, and one of 70 tons under repair. The iron work was executed by a "petty chief ... who had learned the art of forging by attending on the various blacksmiths belonging to vessels which had been at the islands" (235).

A Russian exploring ship under the command of Otto von Kotzebue visited Kailua in 1816. Kotzebue was "surprised to see on the shore barges, sixty or seventy feet long, built quite in the European fashion, which are employed to convey provisions from one island to another" (Voyage 309). At Honolulu, Kotzebue found the Kaahumanu in port; together with a large three-masted vessel, the Albatross which Kamehameha had also purchased for sandalwood and now used "as a transport for provisions from Woahoo to Owhyee ..." (324). Kotzebue was glad to find that as a ship of war he was exempt from paying the new port duties of one piaster per foot, but unhappy to be charged forty piasters by the owners of the eight double canoes which towed him into the harbor (327).
Shortly after Kamehameha's death in 1819, the Frenchman Louis de Freycinet toured the shipyards at Kailua:

We saw at least four locked sheds intended for the construction of the great war canoes; others were used to shelter some boats of European construction from the sun. In others were assembled building timber and sandalwood, cooper ingots, and an enormous quantity of fish nets, all of which appeared to be in excellent condition. Farther away,... we found the blacksmith shop and the cooper's shed. Farther up the beach were several houses...; in one of these we found navigation instruments such as compasses, sextants, thermometers, and watches, and even a chronometer was among them, something I had surely not expected. (8)

Up until his death Kamehameha continued his interest in acquiring arms. Golovnin, who showed great interest in the subject, recorded that in 1818 the Hawaiian Kingdom possessed a hundred cannon of different caliber, including mortars and howitzers, most of which they could use effectively. Fifty of the cannon were at the stone fort by Honolulu harbor. In addition, the kingdom had "about six thousand men armed with guns and all the ammunition necessary for a soldier" (191-92). Golovnin thought that Kamehameha was "preoccupied" with the defense of the Kingdom (199).

While this probably was true, the king and most of the ali'i were also clearly preoccupied with the acquisition of western material goods, including both luxury and practical items. Of practical items, the most important was the adze, used for all woodworking. In 1809 Campbell discovered that
adzes were "universally made of iron" (143). Campbell was also impressed by the fact that Hawaiians now worked with western tools and western styles as carpenters, coopers, tailors, and blacksmiths. Kamehameha employed only Hawaiian blacksmiths at his forge (144).

Nonetheless, ali'i continued to acquire foreigners who had desirable skills. Campbell recorded that such foreigners "are certain of being maintained by some of the chiefs, who are always anxious to have white people about them" (119). Campbell was a sailmaker, and was employed to repair sails on the king's ships. In addition, he made a loom for himself and began to weave cloth for sails, apparently out of thread from olona fibers (99-100).

While metal adzes were widespread among commoners as well as ali'i, the material life of most commoners was otherwise little changed. For the ali'i, however, there were many changes. These changes demonstrate the extent to which most ali'i actively cooperated with the American traders. They also represent some of the most tangible evidence of the change in mode of production and the extent of the development of true social classes. Traditionally in Hawaiian culture—the material distance between ali'i and maka'ainana had never been very great. In large part this was because both the mode of production and the nature of the goods produced acted to restrict ali'i accumulation. Contact with the world market system freed the ali'i from
their traditional restraints and enabled them to significantly modify their material culture. By 1819, the material distance between chiefs and commoners was already large, and not just in terms of guns and ships.

From the time of William Broughton's visit in 1796, Kamehameha and other important ali'i almost always met visitors in European clothing (Broughton 39). By 1812 the female ali'i were also beginning to wear western clothes. The American Ross Cox, visiting with one the the supply ships for the Columbia River settlement Astoria, found two of the "queens" attired in "dresses ... made for them in England, [which] fitted them admirably, and set off their persons to great advantage." He described one dress as a light blue satin gown, trimmed with gold lace; the other was a "cream-coloured riding-habit of cassimere" with "silver lace ornamentation and a profusion of sugar-loaf buttons" (34).

In 1815 Kamehameha met Peter Corney's ship dressed "in a coloured shirt, velveteen breeches, red waistcoat, large military shoes, and worsted stockings, a black silk handkerchief round his neck, [and] no coat ..." (121). In 1816 Kalaimoku greeted Kotzebue "in the dress of an English pilot, with polished boots, and a cocked hat; but all his things were so tight, that he could scarcely move a limb" (Voyage 329). In 1819 Golovnin found Kamehameha dressed in "green velvet trousers, a white shirt, a silk kerchief
around his neck, a coffee brown silk vest, white stockings and shoes, and a round soft felt hat" (182).

Even the commoners were interested in western clothing, but most had little opportunity to acquire them. Kotzebue noted that everyone wanted a least one item of European dress, and concluded that "The Americans certainly buy up in their cities all the clothes which are out of fashion, and sell them here to great advantage" (Voyage 330). Women remained primarily in the traditional tapa garb (although they often wore silk handkerchiefs around their necks), and trousers and shoes were less popular among men than other items. By 1819 Freycinet noted that many of the chiefs had "adopted the European type of clothing--either completely or in part" and that the same was true of women married to whites on O'ahu. He also recorded that straw and felt hats had appeared, and that many women carried small mirrors attached to their handkerchiefs (61).

Houses that were at least partly built in a western style appeared soon after the first foreigners began to live more or less permanently in the islands. Soon such houses were also being built by the ali'i, although initially they were primarily used as storehouses for western goods.

Around 1800 foreigners built Kamehameha a two story red brick house at Lahaina. The brick was locally made and fired, with mortar produced by burning coral. Originally intended as a residence, the building was used for storage
Most of the storehouses however, were built of coral rock. While Campbell was in Honolulu in 1809 he noted that workmen were erecting "a house in the European style" for Kamehameha to live in, and that when he left in early 1810 the stone walls were as high as the first story (154). This may have been the house described in 1811 by Gabriel Franchere as a storehouse, with the first story of stone and the second of wood (64).

The western storehouses, as well as the traditional homes of the ali`i, contained a wide variety of goods. At Kailua, where Kamehameha had built two western stone storehouses, the royal residence was built in traditional style. Golovnin described its interior in 1818:

There we saw to one side a trunk which contained hand weapons ..., next to it a mahogany bureau of European workmanship, two mahogany tables—one large leaf-table and one round; the latter was covered with a blue napkin and on it stood a quart of rum, a decanter half filled with red wine, a large glass of water, and three or four smaller glasses. Next to the table stood an armchair and two or three straight chairs, also of European make. Two very ordinary mirrors, worth not more than five rubles apiece, hung on the wall, and under them, leaning against the wall, stood several guns, cutlasses, and spears. This half of the hut was covered with grass mats, while the floor of the other half was bare and contained an ordinary ship's cast iron stove, in which a fire was burning, and an assortment of dishes in the corner. (182-3)

Freycinet noted that in the towns at least, many of the doors of the ali`i houses had iron hinges and padlocks, and that in general mattresses, couches, tables, and chairs were
appearing in their houses (63-64). The padlocks on houses and storehouses could indicate a weakening of the tabu system with regard to the personal property of the ali'i, but more likely were a precaution against the varying types of foreigners living in the urban areas.

In diet also, though in limited ways, the ali'i had began to distance themselves from the maka'ainana. Rum and wine had been an article of trade very early, and shortly the Hawaiians themselves were distilling liquor from the root of the ti-plant. Kamehameha served "tea-root rum" to Samuel Patterson in 1805 (67), and by 1809 Campbell recorded that "Almost every one of the chiefs has his own still." Campbell described these stills as consisting of iron pots from American ships and copper tubing, items it would be difficult for a commoner to procure or keep. According to Campbell this intoxicant had almost totally replaced the use of kava (133-135).

Chiefs also began to maintain limited collections of wine and liquor, and sometimes served it to visiting westerners. Several westerns also testified to the drinking capacity of both male and female ali'i when they were entertained aboard ship. Cox noted that Kamehameha refused to bargain for supplies until he had obtained a "quarter-cask" of Madeira, even though he already had a quantity of the wine on hand (38).
Golovnin stated that many chiefs drank tea twice a day, and often boiled or fried their food in the foreign manner (210). The addition of many other foreign foods increased the dietary differences separating the chiefs and commoners. In at least one case a chief collected such a quantity of expensive foreign foodstuffs that he attempted to sell them to visiting ships. While Freycinet was at Kailua, Kalaimoku asked for and was granted permission to sell provisions on the ship. The chief brought refined sugar, tea, chocolate and liquor on board, but prices were so high (100 piasters for a keg of rum) that Kalaimoku found no buyers (28).

Hence in many strictly material ways, by 1819 the Hawaiian ali'i at least were leading lifestyles which were dependent upon their participation in the capitalist world-system. This was made possible by the internal transformation of the mode of production and the political system.

Trade with foreign ships for supplies, particularly vast quantities of hogs, gave land a purely commercial value it did not have in traditional Hawai'i. That concept by itself was enough to break the bonds of reciprocal obligation between ali'i and commoners. Land had always been desirable to chiefs, for reasons which included prestige, the support of a larger entourage, the relief of population pressure, and to supply their district with locally scarce resources. Yet more land did not enable the chiefs to free themselves from their obligations as elder
kinsmen. Chiefs were dependent upon the commoners both for production and for warfare. Any surplus production could not be stored for long and ultimately had to be redistributed. Chiefs had no independent access to any resource.

With western trade, the ali'i could use their authority to obtain western goods which did not have to be redistributed, and to which they could if they chose deny access. Access to western guns and ships, to iron, and to foreigners who could produce a variety of non-traditional items were important to the chiefs to establish a power and authority independent of the traditional system. The more land a chief could acquire, the easier it was to obtain the guns and other desirable goods and to support a larger entourage which could include foreigners; in turn, the more guns, ships, and foreigners a chief could acquire, the easier it was for him to use force or the threat of force to seize new land and maintain control over it. Western contact hence provided new motives for land acquisition, while at the same time providing some chiefs with the resources that enabled them both to acquire land and to centralize their authority.

Ali'i therefore had an important interest in controlling trade, and readily assumed the responsibility for providing ships with adequate provisions. Hogs were one of the most desired items, and their availability depended upon an adequate production of domesticated vegetables upon
which the hogs were fed. One or two western ships could utilize several hundred hogs, both as fresh meat and salted down for ship's stores, during a brief stay at the islands. Hence maintaining an adequate supply of hogs for provisioning was a major concern.

There is at least some evidence that the ali'i began to intensify production almost immediately. In 1786 and 1787 Dixon's and Portlock's ships traded extensively on the leeward sides of Hawai'i, O'ahu, and Kaua'i. Dixon believed that O'ahu was an inferior place to trade, with few vegetables and hogs provided. However, between his first visit in May of 1786 and his second in August of 1787 he believed that cultivation had been considerably extended in the area around Waikiki and Portlock. Dixon therefore thought that in a few years O'ahu might be the best place to trade, as subsequently it proved to be (265).

The Kona coast, fortunately for Kamehameha's ambitions, was a good source of hogs from the beginning. Nonetheless, recent archaeological evidence indicates that between 1790-1794, agricultural intensification occurred in one of the few possible remaining areas, the Lalamilo-Waimea section between the Kohala Mountains and Mauna Kea. During the years that Kamehameha prepared to conquer Maui and O'ahu by acquiring firearms, foreigners, western schooners, and a huge fleet of war canoes, the Lalamilo agricultural fields were developed. Kirch reported that the fields represented
something new for the islands: a system of intermittent irrigation on a leeward slope environment (Evolution 186-88).

The fact that very little further intensification was possible on the Kona coast of Hawai'i may also have been part of the motivation for Kamehameha's conquest; without a large and secure supply of hogs, he could not hope to have exclusive trade with westerners. Recent archaeological evidence indicated that once on O'ahu, Kamehameha and his ali'i did begin to increase the productivity of that island. Anahulu Valley, on the windward side, was apparently given to Ke'eaumoku after the conquest. There an elaborate pondfield irrigation system was constructed rather rapidly sometime in the late prehistoric/early historic period. Kirch suggested that this was due to the demands for surplus production to support the chiefly establishment on O'ahu (Evolution 174). Certainly part of the surplus production was used to enable the chiefs to maintain a partial monopoly of the pork trade and the profitable exchange of gifts with ships' captains.

Hence the ali'i response to foreign contact was to intensify production, acquire more land, and establish a monopoly over items which could most profitably be used in trade with foreigners. As already noted, Kamehameha frequently prohibited the sale of pork and also set the price. Ultimately, O'ahu was the major provisioning stop, even
though ships first called on the king at Kailua to receive permission to trade at O'ahu and to discuss the price to be given. Kamehameha usually sent along a representative to make sure the price and provisions were provided as per the agreement (Corney 192).

It was not until the discovery of sandalwood that Kamehameha and the other ali'i acquired a profitable commodity to increase trade. Kamehameha ultimately monopolized this exchange, although whether as a conservation measure or to guarantee that all profits came to him is difficult to say. In all probability he had both motives.

The trade in sandalwood intensified in the years preceding Kamehameha's death, and foreigners began to view the chiefs as oppressive. In 1817 Kotzebue remarked that many of the fields now lay uncultivated, which he believed was because "the inhabitants are obliged to fell sanders-wood" (Voyage 200). The naturalist Adelbert von Chamisso, traveling with Kotzebue, saw eight American ships in Honolulu after sandalwood, and remarked that "on account of this trade, the chiefs burden the people with enforced labor, to the prejudice of agriculture and industry" (73).

In 1818 Golovnin also noted the numbers involved in the sandalwood trade, and concluded "If Tameamea would only devote as much attention, or even half as much, to the interests of his subjects as he does to the interests of the
Europeans living with him, he could greatly relieve the miserable condition of the common people, whose life and property are entirely at the mercy of the chiefs ..." (208). Freycinet described the hardships involved for commoners in the sandalwood trade: "... each log has to be carried on human backs, exposed to scorching sun, across the forests and precipices, where there are no roads." He also was concerned as to what would happen when the sandalwood was exhausted, since there was no replanting (88).

Kamakau recorded that after Kamehameha had returned to Kailua he and all the chiefs had ordered men on the island of Hawai'i to cut sandalwood. This rush of labor to the mountains brought about a scarcity of cultivated food throughout the whole group. The people were forced to eat herbs and tree ferns ... The chief [Kamehameha] immediately declared all sandalwood to be the property of the government and ordered the people to devote only part of their time to its cutting and to return to the cultivation of the land. (Ruling Chiefs 204)

Kamehameha also "ordered the sandalwood cutters to spare the young trees and not to let the felled trees fall on the saplings ..." (Ruling Chiefs 210). Kamehameha's actions were those of both a traditional chief who functioned to conserve resources and a king who monopolized access to a profitable commodity.

The distance between chiefs and commoners increased not only in material ways and in access to certain critical resources, but geographically as well. Traditionally most
ahupua'a and district chiefs had lived on their land, and hence were physically able to be stewards of that land. As Kamehameha conquered each island, the traditional chiefs were replaced with ali'i, primarily from the island of Hawai'i, who were personally loyal to Kamehameha. Rather than granting each ali'i large units of land, Kamehameha gave each small units, frequently in different districts and on different islands. Hence there was no way a chief could live on all the land for which he was responsible (Caroline Ralston 29; Kelly, "Changes" 75-76).

In addition, most of the ali'i traveled with Kamehameha where ever he went. In 1802 Turnbull found Kamehameha on Maui with his ali'i, "that he may have them constantly under his eye, and not leave them exposed to the seductions and conspiracies of rival chiefs" (24). Kamakau also stated that this was the reason Kamehameha wanted the chiefs to travel with him, rather than living apart "where they might gather men about them and some day take it into their heads to conspire against his rule" (Ruling Chiefs 178). As a result of this practice, Shaler noted that Kamehameha "draws after him a train more destructive than locusts" (82). Certainly after the king settled permanently on the island of Hawai'i, some of his ships were utilized to constantly ferry in provisions from O'ahu.

Kamehameha established a system of island governors to be his resident representatives. The first governor of the
island of Hawai'i was actually a non-Hawaiian, John Young. Foreigners were often given land (or use rights to land), and the resident commoners were therefore given a chief with no knowledge of the traditional system of reciprocal obligation. These foreign "chiefs" were also incapable of fulfilling the ali'i role as stewards of the land.

Foreigners who acted as chiefs were required to pay set taxes to Kamehameha, as were all ali'i. Those who were unable to make their payments were at least on occasion deported from the Kingdom, together with their Hawaiian "laborers." Barnard's ship carried a number of foreigners and Hawaiians on such a forced resettlement in 1815, and he noted that these were not the first individuals deported (238).

Hence by 1819 the social relations of the mode of production had been altered, ali'i had become physically and materially distant from maka'ainana, and political power had become centralized. Clearly these events could not have occurred without major effects on the maritime mode of production.

ENVIRONMENT, TECHNOLOGY AND KNOWLEDGE

In the areas of environment, technology, and knowledge, the maritime mode of production changed slowly as compared to that of the land during the early period of contact. One reason for this was that the sea surrounding the islands contained little of immediate commercial value to the
foreigners that Hawaiians could use for trade. Another reason was that even though most of the westerners, and particularly the New England Americans, came from cultures where fishing was a vital activity, materially and intellectually they had little of advantage to offer Hawaiian fishermen. The advantage, and hence desirability, of metal over stone axes was clear. The advantage of metal fishhooks over bone or shell hooks was far from clear. Western commercial fishing techniques were highly successful yet could not easily be transplanted to the Hawaiian environment. In addition Hawaiian techniques could already yield large catches of fish. However, no new motivation developed to encourage fishermen to intensify production, since again there was not the commercial demand for fish that existed for hogs, vegetables and sandalwood.

Hence the ocean continued to assume for the most part its traditional role in the Hawaiian economy, while land acquired a value it had not had prior to contact. This fact itself was a radical change in the Hawaiian perception of resources however, and it helped to shatter the traditional unity of land and sea. Traditionally access to fisheries was restricted by the same concepts of joint tenure which applied to the land, and ahupua'a and district chiefs acted in ways which helped conserve the resources of the ocean as well as the land. But the ocean contained little that the
ali'i could use for personal aggrandizement, and consequently the differentiation of land and ocean resources began.

The ocean environment itself was probably the least affected of any part of the maritime mode of production. The land, by contrast, showed all the vulnerability predictable for island environments. Many new plant and animal species were introduced and began to successfully compete with native species for the same habitat. In addition, deforestation accelerated due both to agricultural expansion and the need for wood to provision the ships. Sandalwood became commercially extinct and virtually disappeared during the next thirty years.

Some of the events on land may well have affected the ocean, although there is no direct evidence of this during the early contact period. Deforestation and increased cultivation in particular probably increased the amount of silt entering the ocean from the land, but to what effect is difficult to determine. Coral for building stone and to produce lime also was obtained from the reefs but probably not in sufficient quantities to cause significant change.

Effect of Western Provisioning

Fish and shellfish were an object of minor trade with foreigners during this period, but there is no indication that this slight increase in demand could or did affect fish populations. It may well be that this was a demand the
Hawaiians did not meet, not from a shortage of fish but simply because ali'i found that the demand for other provisions was much greater (and hence more deserving of their attention).

According to the account of William Ellis, Cook's ships purchased both fresh and salted fish when and where it was offered to them. While sailing off the fishing grounds near the southwestern end of the island of Hawai'i, enough "albecore" were purchased for Ellis' ship, some weighing almost thirty pounds (143). Salted fish was purchased from a nearby fishing village, but little was available at Kealakekua or anywhere else except at Kaua'i and Ni'ihau. There the expedition purchased quantities of salted "cavalla" [jack fish or ulua] (143).

Most of the accounts of fish purchases indicate these early western ships obtained primarily benthic and pelagic fish, and frequently observed Hawaiians fishing for these types of fish. While the westerners may not have been interested in the smaller inshore fish and shellfish, this at least indicates that on some islands there was an adequate surplus of fish from the other two zones.

Portlock purchased flying fish (mālolo) from fisherman along the western shore of O'ahu (76), and salted "snappers, rock-cod, and bonetta" from Ni'ihau (88). Colnett found the people off the southwest shore of O'ahu had nothing to sell but "great Quantities" of fish (Prince of Wales 155). He
also noted the prevalence of both fresh and salted fish, as well as turtle, at Ni'ihau (182). On Vancouver's ships, both Bell (22) and Manby recorded the large quantity of salted fish available at Ni'ihau. According to Manby, "The fish they take are principally Bonettas, Dolphins, Albicore, and Cavallies of a very large size. An ample supply of this was laid in for our Sea stock making a pleasing variety in our diet" (33). Fish were so plentiful on Ni'ihau that according to Manby they were traded to the people of Kaua'i for cloth and mats. Only the Spaniard Quimper bought what he termed "excellent snails" at both Kealekekua and at Waimea on Kaua'i (Minson 39,81).

After 1800 westerners make practically no mention of trade for fish. Either trade continued but was not recorded, or fish ceased to be an item requested by the foreigners or offered by the Hawaiians. There is certainly no reason to think that western demand placed a strain on the productive system of the Hawaiians. What does seem clear is that ocean products were not particularly important trade items, and hence did not acquire any additional value from trade with westerners.

Marion Kelly has suggested that the Hawaiian demand and dependence upon fish increased due to the fact that less pork was available (Changes 63). While quite possible, that suggestion is very difficult to document. Westerners always remarked that fish was a major source of food, beginning
with Cook. Women could not eat pork in any event, and hence the increasing diversion of hogs to the western ships made no difference in their diet. For women as well as men, dogs and fowl were also available as protein sources. Westerners introduced goats, sheep, and cattle very early, and the first two were both consumed and used as trade. Cattle, brought by Vancouver, were not utilized for food or trade for ten years thereafter, and subsequently remained a monopoly of ali'i and certain resident foreigners. Despite the availability of these additional new protein sources, an increased demand by Hawaiians for fish may have been one factor which operated to decrease the actual supply of fish.

Two other factors may also have been in operation, and both involve a change in the social relations of production. Ali'i may have become less interested in pelagic and benthic fishing, and concerned with their traditional role as stewards of the ocean resources. In addition, major fishponds may have become the exclusive and undistributed property of the ali'i. Evidence for these changes will be discussed in the section on social relations. These two factors, if combined with an increased demand for fish due to a shortage of pork for local consumption, might cause the maka'āinana to begin overfishing the inshore zone in some areas.

During the period up to 1819 however, there is little direct evidence that this actually occurred. A bit of
indirect evidence comes from the actions of Kamehameha himself, as reported by Kamakau. Kamehameha, in his own devotion to fishing, frequently acted in much the same ways as a traditional ali'i nui should. During the last years of his life, at the same time that he gave similar orders to the sandalwood cutters, he ordered fishermen to spare the young fish (Kamakau, *Ruling Chiefs* 210). This was not a conservation method practiced in traditional Hawai'i, where small and young fish were particularly relished. If the report is valid it represents an innovative approach on Kamehameha's part. That such an action could have been motivated by a deterioration of the inshore environment is impossible to prove, although events in the later period make this a distinct possibility.

In general however, what little is recorded of fish and fishing does not indicate any particular shortage of fish or a decrease in the size of fish catches. Campbell for instance, observed mālolo fishing off O'ahu in 1809, and described the method used in some detail. He concluded that "prodigious numbers [of fish] are taken. I have known them return, after a day's fishing, with ten or twelve canoes deeply loaded. Sometimes the net is so full they cannot take it on board, and are obliged to drag it after them to the shore" (142). Chamisso, the naturalist with Kotzebue on his 1817 visit, also recorded large catches from inshore fishing on the reef off Honolulu. "Many canoes were outside
the breakers in depths of from ten to fifteen feet engaged in fishing. They were using long drag nets, with which they caught a great variety of fish, particularly Chaetodon species [butterfly fish] that shimmered in the most wonderful colors" (77).

Some of the best descriptions of fishing during this period come from Peter Corney's visit in 1815. In one instance, Corney was invited to join a fishing party organized by ali'i which took place on the reef flats to the west of Honolulu Harbor.

[I]n the morning, the nets were run out and set on the flat. The people collected from all parts of the island: they all strip and start from two points, making a circuit of several miles; both parties meet on the outer edge of the flats, and, forming a circle, they gradually close in, keeping their feet close together to prevent the escape of the fish, the water not being more than knee deep. Each person is provided with a scoop net and a bag net over his shoulder; they are permitted to scoop up what they can and fill their bag; still closing in, when the nets are drawn all round after them. By this method they catch 50 or 60 canoe-loads. There were not fewer than 6000 people collected at this party, which ended, as all such do, in a fight about the division of the fish. (207-8)

Corney also observed mālolo fishing, using two double canoes and the traditional large bag net. He recorded that "six or eight canoes full" was a typical catch. He described fishing for aku, 'ahi, and mahimahi in the traditional manner, including the use of the pearl shell lure. For this type of aku fishing, Corney reported that in a few hours forty or fifty fish could be caught. Fish
poisoning was another method he saw Hawaiians use, although he does not record the size of the catch (209-210).

It is therefore reasonable to conclude that even if there was an increased demand for fish, particularly on the inshore zone, it probably did not as yet affect the productivity of any of the three zones. The traditional techniques and materials employed by the Hawaiians were still capable of large yields. Nonetheless, the techniques and materials themselves had started to change.

**Material Changes**

In material ways, the intrusion of foreigners into the maritime mode of production began to have an effect on fishing almost immediately, even though the change was gradual as compared to material changes in other areas of the culture. These changes in material culture had some affect on how people fished as well as on the traditional craftsmanship involved in artifact manufacture.

As has already been noted, small nails were often used by westerners in trade, and were one highly desirable item obtained from Cook's ships. The Hawaiians found it relatively easy to reshape the nails into fishhooks. Samwell recorded that while Cook's ships were still at Kealekekua Bay "we saw many small fishhooks which they had made with the nails they got from us ..." (Beaglehole 2: 1186).

Nails, which could be shaped to replicate traditional hook styles, were superior to bone or shell hooks in two
ways. First, they required much less labor to make than those of traditional materials, which had to be slowly and carefully crafted using coral and sea urchin files. Secondly, the curve of the hook, which was subjected to considerable stress when the fish was caught, was less likely to break if the hook was metal. This was particularly true if fishhooks were of the jabbing type, where the line needed to be pulled sharply to set the hook.

There were also disadvantages to hooks manufactured from nails, and the same was true of western hooks. Fishhooks manufactured by westerners were essentially jabbing fishhooks, and hence could not really compete directly against the incurved, rotating fishhook when fisherman were using techniques and seeking fish which required the latter type of hook. Modern experimental studies (cited in Johannes, Words of the Lagoon 116) have demonstrated that rotating hooks do indeed catch more fish in long line fishing. In addition, jabbing fishhooks were more likely to snag on coral bottoms. Nails and western fishhooks could be altered into traditional rotating hooks by the fisherman, but for fishing techniques utilizing those types of hooks the extra strength provided by metal was not particularly needed.

Neither nail hooks nor western manufactured hooks could successfully compete against pearl shell hooks, particularly the aku composite hook or lure. If metal hooks were used
instead of the traditional composite hook with its pearl shell shank, live bait had to be obtained for the aku fishing, and the fishing techniques modified. The substitution of a metal over a bone point as part of the aku hook only minimally decreased the labor involved in its manufacture.

For these reasons, metal fishhooks were not the immediate success that metal adzes were. Hawaiian fishermen who tried all the various imported fishhooks and nail hooks undoubtedly came to the same conclusion as James Trevenen, one of Cook's officers who collected a variety of fishhooks while on the islands:

Those who have tried these [Hawaiian] fish-hooks, as well during the voyage, as since in different tropical climates have universally found them superior to all of European construction, whether made of Iron solely or the d[w?]oden imitations of flying fish &c. the shining Mother of pearl much better resembling real fish than any other substance however artificially painted & formed. (Trevenen, n.p. [21-22])

From the perspective of fishing technology, the westerners had little to offer the Hawaiians. Hence metal fishhooks slowly rather than rapidly began to replace hooks of traditional styles and materials.

By 1809 the use of bone hooks had apparently decreased, and Campbell does not mention their use on O'ahu. He noted that "The hooks are sometimes made of mother-of-pearly and tortoise-shell, but those procured from ships are coming into more general use" (142). Of aku, 'ahi, and
mahimahi fishing, Campbell observed that "For hooks of their own manufacture bait is not required, the mother-of-pearl shank serving the same end. When wirehooks are used, they wrap a piece of white cloth round them" (142). Since this was a less efficient fishing technique, it is unlikely that it was used by fishermen if the pearl for composite hooks could be obtained. As late as 1818 Golovnin stated that "The natives make the fishhooks out of shells, bones and hardwood and prefer these to our iron hooks" (224). In 1819 Freycinet described fishhooks as being "formerly made of tortoiseshell, bone, wood, and mother-of-pearl, but more recently replaced by iron hooks" (83).

An additional, although probably minor reason that western technology did not so quickly supplant Hawaiian fishhook styles and techniques was that it was more difficult for fishermen to obtain western goods than it was for the ordinary commoner. Unless supported by an ali'i who cared to supply him, the fisherman (particularly the specialized benthic and pelagic fisherman) had difficulty trading directly with the westerners, since fish were not a highly sought item. This fact apparently initiated (or modified) a type of market exchange between the specialized fishermen and farmers. This is illustrated by the description Menzies provided of events he witnessed in a small fishing village along the south shore of the island of Hawai'i.
When the fishing canoes came into the bay in the evening, we had an opportunity of observing their manner of traffic with one another, as the whole village and people even from other villages flocked about them and a brisk market was kept up till they disposed of all their fish for small nails and bits of iron, and sometimes we observed that they drove very hard bargains. Of these nails the fishermen make their fish hooks, and no doubt are obliged in their turn to purchase potatoes, yams, cloth, etc., from the planters. Thus we find that nails and bits of iron here answer all the purpose of money and circulate amongst the natives in the same way that gold and silver does with us. (177)

By 1819 fishhooks of traditional materials and styles were still in use, but were in the process of being replaced by hooks of western materials in both traditional and western styles. A factor that influenced this may well have been the increasing difficulty that fishermen had in obtaining suitable pearl shell for fishhook manufacture.

As was noted in chapter three, pearl shell was a relatively scarce item, since it was plentiful only on O'ahu where quantities came from both Pearl Harbor and Kane'ōhe Bay. Pearl shell as well as pearls were from the beginning one of the few ocean resources of commercial value for trade with westerners, and pearl shell retained that value even though it could not be produced in large quantities. As early as 1791, Quimper was trading for pearl shells with Kamehameha (Minson 38). As an ali'i nui, Kamehameha had probably himself obtained these shells from O'ahu, but traditionally the shell would have been used to provide his fishermen with hooks, rather than as a trade item.
Once in control of O'ahu, Kamehameha monopolized the supply of pearls and pearl shell. Campbell noted in 1809 that since the king had learned the value of pearl shell, "he has kept the fishing to himself, and employs divers for the purpose" (115). In 1815 Corney saw many divers at Pearl Harbor, and his ship presented Kamehameha with an oyster dredge (96). The pearls were not of a high quality and consequently few of the foreign ships were interested in trading for them. Pearl shell however continued to be a small export item, and in 1816 Kotzebue noted after a trip to the Pearl River: "The pearl fishery is prohibited on pain of death, and the king has the sole profits of it" (Voyage 338). Hence some fishermen may have been forced to utilize imported hooks, and to modify their fishing techniques accordingly, because of the difficulty of obtaining pearl shell. Ultimately this is a case of a change in the social relations of production forcing a change in the material aspects of production.

Other material changes occurred in fishing technology. In describing the fishing nets in use in 1809, Campbell remarked that the lower edge of the nets were held under water by weights of lead or iron. Besides indicating a relatively minor change in fishing technology, this is also an indication that iron was indeed plentiful enough that it could be used for purposes where its advantage was merely a convenience.
In one important aspect of material technology, nets and lines, the traditional olonā fiber not only met with no western competitor, it was from the beginning an important trade resource for the ali'i, as many western ships used it to replace their rigging (e.g. Rickman 298-297; Portlock 59). While not itself a product of the ocean, the major function of olonā in traditional Hawai'i was the manufacture of fish nets and lines.

Olonā needed wet, almost marshy lands to grow and was not available in all districts or ahupua'a. It had probably therefore always been an item collected by ali'i during the Makahiki and distributed to fishermen, as noted in chapter three. Funk has argued that it was only after western ships increased the demand for the fiber that the plant was actually cultivated by the Hawaiians (17). She found only one reference to olonā cultivation in the early literature, by Kamakau. He may well have been describing the post contact situation, particularly since he stated that olonā cultivation brought the farmer "prosperity" and "a life of ease." Olonā could be used to "barter" for food, fish, "valuables, and necessities" (Kamakau, Works 44). If this value of olonā was not entirely due to its desirability as a trade item with western ships, olonā clearly had a type of value in a transformed economy that it did not have traditionally.
There is no evidence however, that Hawaiian fishermen experienced an actual shortage of olonā due to its value as a product in western trade. This may be partly due to the increase in olonā production with domestication. There is also evidence that, at least for nets and fishing lines, Kamehameha continued to redistribute these items not only to his own fishermen but to other ali'i (Ii 69). The fisherman's nets and lines continued to be woven primarily of olonā fibers.

The canoe, a vital tool of much inshore fishing as well as benthic and pelagic fishing, also began to change in the manner of its construction and in details of its rigging. Metal adzes shaped in imitation of the traditional stone adze quickly became the primary tool for canoe construction. While this change led to the disappearance of specialists in stone adze manufacture and may have affected social mechanisms formerly used to obtain suitable stone, canoes continued to be built for the most part in traditional styles with traditional materials. Some significant changes did occur however.

One change involved the rigging and sails of the double canoes. As noted in the previous section, the ali'i almost immediately began to rig their canoes like small western vessels, and to acquire canvas sails. By 1819 Freciynet said all the double canoes he observed were "rigged as cutters", having "a yard, boom, and mainsail, and two jigs--
a purely European installation." In addition, all the canoe sails that he saw were of canvas (86). Since double canoes were owned by chiefs and were part of the fishing fleet, and since canoe-making in general was an activity primarily supported by ali'i who in turn provided canoes for their fishermen, the growing dependency on western produced materials for canoe production is one of the most significant changes in maritime material technology.

It is also probable that the obsession with western style ships began to negatively affect ali'i organized canoe manufacture, particularly after the possibility of warfare disappeared in 1810. According to Golovnin, who visited Kamehameha's Kona shipyards in 1818, outrigger canoes were still being constructed, but the large "war canoes" (double canoes) were no longer made. Instead, the shipbuilders produced "brigs, schooners, gunboats and armed launches of European type" (220). While canoe builders were still supported by the ali'i, the craftsman who manufactured traditional canoe-making tools were not. The canoe builders themselves used only metal tools, and spent a major portion of their time involved in the production of western vessels which were not used for fishing.

**Fishing Methods**

Other than in the material ways already noted, there is little evidence that the fishing techniques themselves changed in any major way. All three zones continued to be
exploited using traditional techniques, with only one possible and one definite change.

The possible change involved the method used to fish for aku. Kamakau described aku fishing in the period before 1819 as being primarily done with live bait for chum and the use of baited hooks. He makes this sound like a recent innovation, for "In the very old days, 'iao and small fishes were not the bait used to attract aku, kawakawa, and 'ahi fishes. Fishermen searched for a hard bait, that is an uhi, or thick mother-of-pearl bivalve ..." (Works 74). Kamakau also noted that the ali'i, including Kamehameha, were fond of this second type of fishing, and that it was not possible to do the two types of fishing in the same area (75). The possibility clearly exists that during this early period of contact bonito fishing with the pearl shell lure began to decrease, while fishing with live bait increased. If valid, this could be due to both to the decreasing availability of pearl shell, and the advantage (in terms of manufacture time) provided by metal fishhooks, which if used had to be baited. Perhaps the former is the more likely interpretation, since the actual point of a bonito lure hook could be manufacture of metal, as long as the shaft, which acted as the lure, was of pearl.

Kahaulelio provided evidence to support this interpretation. Born in 1830, Kahaulelio fished as a boy with his father and grandfather. His father was the head fisherman
for Hoapili, a Lahaina ali'i. Kahaulelio apparently did not himself fish for aku using pearl shell lures, for his father told him that he [the father] had lost all of his good hooks. The hooks had been broken off by large 'ahi and the father had never been able to replace them, as they had been obtained originally "From Hoapili-kane because I was his fisherman ..." (12). Thereafter, the father went aku fishing only with live bait. Although it is not clear precisely at what date this change occurred, it is probably representative of the difficulty experienced very early by fishermen as ali'i became less and less interested in their traditional support of pelagic fishing.

This interpretation also fits with the observations of some westerners. Corney, who in 1815 spent several months in the islands and who associated primarily with ali'i, described only one method of bonito fishing, the use of a traditional shell lure (209). Chamisso, the naturalist with Kotzebue in 1817, also gave an accurate description of bonito fishing with the pearl shell lure. He noted that "This fishing is here, as large game hunting is with us, a kingly pastime" (72). If more fisherman were using metal hooks and live bait, and if the two fishing methods could not be used at the same place, it might indeed give the appearance that bonito fishing was reserved for ali'i.

Another type of pelagic fishing was apparently given up almost entirely. The niuhi or great gray shark was sought
far from land, so far, according to Kamakau, that "the land looked level with the sea" (Works 87). Beckley referred to this type of fishing as the "Game of Kings" (19), since between fifty and a hundred of the largest single and double canoes participated (11). According to Kamakau, a dead man or pig was used as chum; Beckley stated that large quantities of baked shark liver were used. Both agree that the shark was partially tamed by being fed several times, and then noosed and taken ashore. Beckley stated that the last "regular fishing" by this technique took place around 1803 (11). While it is unlikely that niuhi fishing was ever of much dietary importance to Hawaiians, sharks traditionally provided a variety of other goods, such as teeth for knives. Not only were some of these goods being replaced by metal, the cessation of deep sea shark fishing also represented a growing ali'i withdrawal from the support of pelagic fishing.

In the period after 1850, when Hawaiian historians such as Ii, Kamakau, and Malo attempted to describe traditional Hawaiian fishing and other aspects of traditional culture, there are frequent regretful comments to the effect that certain types of knowledge were entirely lost. It is impossible to specify exactly what information disappeared when, or with whose death, but the disappearance of traditional knowledge undoubtedly started prior to 1819. By that time, changes had occurred in traditional fishing artifacts
and methods, and other changes in the social relations of production had affected the way knowledge was passed from one generation to another. In addition, given the slow but steady population decline during this period, many older men who knew the secrets of particular fishing grounds may have died without passing on their knowledge.

While not specifically discussing traditional fishing knowledge, the naturalist Chamisso was already concerned in 1817 that Hawaiian culture was disappearing unrecorded. He believed that more needed to be done to record the customs and traditions of the Hawaiians, for "the European will one day find on the Sandwich islands, new Europeans, who will have forgotten their origin and their ancestors" (qtd. in Kotzebue, *Voyage* 244). While Chamisso was wrong in thinking that Hawaiians would soon become "new Europeans," he recognized that major changes had already occurred in Hawaiian culture. Thus far only changes in the environment, technology and intellectual aspects of maritime economy have been examined. The most significant changes however, were in the social relations of production.

THE SOCIAL RELATIONS OF MARITIME PRODUCTION

By 1819 the social relations of production had basically changed from that of a kinship mode to a tributary mode. As already discussed, this was due both to the demands of external trade and the ability of the ali'i to use the foreigners to achieve internal goals. This change
affected the access, allocation, and redistribution of maritime products, even though neither foreign nor new ali'i interests centered on those products. Direct evidence for the change in the social relations of maritime production exists, although for the time period prior to 1819 much of the evidence is inferential.

Access

As noted earlier, when Kamehameha divided up the land and its attached fisheries and fishponds between his ali'i supporters, each was given relatively small areas of land in different districts and different islands. The major ali'i traveled and lived near the king (primarily either in Honolulu or Kailua, Kona) and therefore were not resident landlords. The land and fisheries were left under the supervision of appointed agents, or konohiki. The konohiki had difficulty replacing the traditional chiefs as stewards of the land and sea however, since their major obligation was to provide their ali'i with whatever was requested.

In the years after 1795 the ali'i began to "request" more than ever. "The uniting of the land ... brought about excessive taxation." According to Kamakau, each chief and konohiki "used the commoner to further his own purpose."

The chiefesses demanded such delicacies as the dried intestines of fish, sea slugs, sea cucumbers of various kinds and sea urchins. Because of these oppressions, some men migrated to Tahiti or fled to Kauai.... (Ruling Chiefs 231-32)
The passage perhaps can not be taken literally, since the task of gathering sea cucumbers and urchins required only the skill of diving was not usually organized by ali'i. It is possible however that Kamakau's statement reflects both a shortage of certain inshore foods and a new ali'i orientation toward the sea as a place to obtain relative scarce and hence luxury items. The activities might also have been "oppressive" because the ali'i demand prevented commoners from inshore fishing on their own account.

Some of the new landlords were foreigners. In the case of foreigners the fisheries did not necessarily accompany the land, at least if the sea was of particular value to the king. The same may have been true for grants to ali'i, permitting Kamehameha to retain the sea if he so desired. Once again, the land and its attached fishery were being treated as separate units rather than a continuum.

As early as 1809 the Spaniard Don Francisco de Paula Marin was given what is now Ford Island in Pearl Harbor, where he kept several hundred sheep and goats (Campbell 117-18). At that time the fishery (particularly for pearl shell) was monopolized by Kamehameha, and Marin was granted only the land. In 1818 however, Marin recorded that "Craymocu [Kalaimoku] gave me the sea of the Island of Little Goats." Marin went there in early February and "they killed a small hog and I took possession of the sea" (Gast 222).
Marin's "sea" may have extended to no more than a depth of five or six feet around Ford Island, but it is interesting to speculate on what Marin did with the ocean products, probably including pearl shell, now under his jurisdiction. Perhaps simply because he was a foreigner, but perhaps also because Marin might not redistribute products in the traditional manner, at least one Hawaiian protested Marin's "taking possession of the sea," but it was reaffirmed by Kalaimoku (Gast 222).

Access to the ocean, as indicated in chapter three, was partly controlled by the ahupua'a concept, where for larger ahupua'a the sea at least out to the edge of the reef, or even further if there was no reef, was considered part of the ahupua'a. Except for ali'i nui or other high chiefs, use rights to the ahupua'a fishery were restricted to residents of that ahupua'a. The foreign ships did not recognize this Hawaiian method of restricting access however, and fished wherever they anchored. Resident foreigners, to the extent that they did fish may have also ignored the restrictions, although Marin recorded that he asked permission from a local konohiki prior to a fishing expedition (Gast 217).

As previously noted, in other areas of the Pacific restricted fishery might extend much further, and it is possible that this was also true in Hawai'i. On Palau, in theory at least, district fishing rights at one time
extended as far as seabirds foraged, or perhaps as much as 100 miles (Johannes, *Words of the Lagoon* 65).

If the Hawaiians ever had a comparable system, fishing rights associated with *ahupua'a* probably shrank during this time period. It is possible that the disappearance of such rights in Hawai'i coincided with the abandonment by the *ali'i* of organized shark fishing far offshore. Johannes recorded that in Palau, chiefs had formerly organized shark fishing (where sharks were caught with a noose, as in Hawai'i) and that sharks caught in this fashion were particularly valued, and the men who caught them were held in high esteem (*Words of the Lagoon* 14). In Palau chiefs continued to organize offshore shark fishing until approximately 1900, and when it was abandoned, district fishery rights shrank to no further than the edge of the reef (*Words of the Lagoon* 65). Hence Palauan shark fishing could be interpreted as a partially symbolic assertion of the extent of a chief's domain, since sharks could also be caught inshore.

In Hawai'i Beckley stated that these sharks and their captors were also valued, primarily because they were believed to possess *mana* or supernatural power. This is the type of shark fishing organized only by chiefs, yet it had been abandoned some eighty years before Beckley's description; that is, by 1803 (11). It may be that territorial fishery rights shrank at the same time.
Regardless of the extent of ahupua'a and district fisheries, chiefs retained the right to tabu all fishing, particular fish, or fishing in certain specific areas. For the most part, such tabus as are documented are tabus imposed by Kamehameha rather than any other ali'i, and may indicate that this was another prerogative he reserved for himself. From the descriptions which exist such tabus were if anything more prolonged than earlier ones.

Two sources recorded six months tabus or more on all or almost all fisheries. Kamakau stated that one of Kamehameha's accomplishments was to place "restrictions on sea fisheries for periods of five months" after which fishing was permitted. The king and the commoners shared the first day's catch and the landlords and commoners the second day's catch. After that everyone was free to fish for six months. "At the end of this period restrictions were again placed over certain fish in order that they might increase." The tabu included the "deep-sea fishing grounds" and fish like the kāhala (benthic), aku and flying fish (both pelagic) (Ruling Chiefs 177-78).

Campbell reported an even more restrictive tabu for O'ahu in 1809.

The occupiers or proprietors of land are entitled to the privilege of fishing upon their own shores as far as the tallest man in the island can wade at low water, and they may exercise that right at all seasons; but beyond that the sea is tabooed, except at two periods in the year, of six weeks each, during which unlimited fishing is allowed.
At these times it is the general employment of the natives, and they cure enough to serve them through the tabooed season. (142-43)

John Whitman, resident between 1813-1815, stated that the fishing grounds on the reef off Kalihi Valley on O'ahu were tabued for at least a six month period, a tabu which apparently included the entire reef regardless of its depth.

[O]nce in every year about the month of August the King by proclamation commands every man on the Island to assemble here to fish. These grounds being tarbooed [tabued] for the half year previous to the grand fishing. He forfeits his life whose temerity leads him to enroach upon the Kings privilege by taking a single fish during the tarboo. (Holt 75-76)

Fishing was done by a method in which one end of the net (actually many nets joined together) was held on shore, while the rest was laid by a double canoe in a large semi-circle across the face of the reef. All fish of whatever species were taken. According to Whitman, all fish caught in the first three days were the property of the king. After that, the fishery was apparently open for the next six months (Holt 76).

Accounts of such lengthy tabus, primarily involving the island of O'ahu, may be highly significant. After 1800, Honolulu became an important port of call for the American and other foreign ships, and supplied a large percentage of the hogs and vegetables needed by the ships. If any island suffered from a shortage of hogs for local consumption, and
an increased pressure on fishing, it should have been O'ahu after 1800.

O'ahu also had the largest number of resident foreigners of any island, although still probably well under 200 (Schmitt, Demographic Statistics 43). Golovnin in 1818 described a measure which presumably applied only to foreigners, although possibly to Hawaiians as well. In discussing the Kingdom's "civil administration," Golovnin noted that it was "not organized at all as yet," and the king still obtained food and other needed items "by degree."

[However] ... following the European example, a permanent tax has been instituted. For instance, the land owners must pay an annual tax according to the number of workman they hire. Elliot pays a tax of forty piasters for his land where he employs ten to twenty people; for the right to fish near the shores each boat pays one piaster for the periods of fishing that occur at different seasons. I have not heard of any other permanent or compulsory taxes.... (205)

It is unclear from the context if this "fishing tax" applied only to foreigners or to everyone, although Golovnin apparently thought the latter. In all probability however, this cash tax was an attempt to accommodate resident and other foreign demands to fish, while at the same time regulating access in a totally non-traditional manner. It was in fact a fishing license.

Another non-traditional method of limiting access to fish has already been noted. Shortly before his death, Kamehameha tabued the taking of young fish as well as young
sandalwood (Kamakau, Ruling Chiefs 210). This may have been a response to a perceived decrease in fish populations, particularly of inshore species.

The specific fishing tabus regulated by the monthly and annual religious cycle had been rather seriously altered before the actual abolition of tabus in 1819. While the four short tabu periods during each month were a relative minor inconvenience to ships which called for supplies, the ten day tabus could seriously interfere with trade. Ships did not usually spend long periods of time in the Islands, particularly after most fur traders started to winter in the Pacific northwest due to the increasing shortage of furs.

Since the long tabu periods associated with the aku and 'opelu were based on a lunar calendar, it was difficult for the western ships to predict exactly when they would occur (assuming any were actually interested in doing so) and in any event sailing schedules could not be so precisely planned. When ships arrived in the islands they wanted to trade (and have the girls come out) immediately, and found the tabus which prevented canoe travel extremely irritating. The ali'i were just as interested in trade with the ships, and soon shortened or modified traditional tabus so that trade could continue.

An early mention of the shortening of a tabu was recorded by Quimper at Kealekekua in 1790. On March 3 the Spaniard recorded that a tabu on trade had occurred. The
next day however, the tabu was "suspended." It was Quimper's belief that the tabu was suspended in order that trade could resume (Minson 61). If he was correct, he had apparently observed the first day of the short two or three day religious tabus which were part of the normal monthly religious cycle. Hence very early the ali'i had began to shorten the tabu period for the monthly tabus. However, this may not have been a common occurrence, since as late as 1816 Kotzebue remarked on the strictness with which high ranking ali'i observed the four monthly tabu periods (332).

Of more importance is the modification of the ten day tabus associated with the beginning of the tabu periods for 'ōpelu (normally in August) and aku (usually sometime in February.) Vancouver's second visit to the island of Hawai'i in early 1793 coincided with the beginning of a ten day tabu on fishing and ocean travel. When his ships returned at the same time in 1794, Vancouver noted that "it is the perogative of the King to shorten its [the tabu's] duration ... [and] he directed on our account that in the district of Akona [Kona] it should cease ..." (3: 18-19). As a result, the tabu period was only two days (also Menzies 174).

Visiting off the Kona coast in August of 1798, Townsend recorded the presence of a ten day tabu on water travel which marked the beginning of the tabu period for 'ōpelu. Despite the tabu however, canoes continued to come out to
the ship (6). Somewhat later, in summer 1803, Cleveland's visit to Kealakekua Bay coincided with the same tabu period. John Young told Cleveland that this tabu had been ten days long when he (Young) first came to the Islands in 1790, but that it had now been everywhere reduced to three days (231).

Freycinet visited the Hawaiian Islands in August of 1819, shortly after Kamehameha's death but before the formal abolition of tabus by Liholiho in October of that year. Since this was a scientific expedition, Freycinet took care to describe the Hawaiian culture as completely as possible. With regard to the two annual fishing tabus he stated:

"Formerly, there was a six-month period during which it was forbidden to fish for bonito and some other fish, of which we could not obtain the names" (64). While Freycinet clearly could have tried harder to obtain the name of the 'ōpelu, the implication of his statement is that not only were the ten day tabus on ocean travel being ignored, but that the alternating six month fishing tabus were no longer in effect.

Hence by 1819 the basic tabus which limited access to fishing resources and to particular fish had changed, perhaps dramatically. Alteration of these tabus did not, in all probability, lead to any immediate overfishing on the part of the Hawaiians. The real significance is related to the obvious change in the role of the ali'i in relationship to the ocean resources. The tabu system, even tabus that
were part of the traditional annual cycle, had become something ali'i could manipulate for their own purpose. Ali'i purpose primarily involved personal aggrandizement. The alternating six-month tabus on aku and 'ōpelu fishing had functioned, consciously or not, as a conservation measure. The two ten-day tabus on all canoe fishing which marked the beginning of each six month tabu not only further limited fishing, but functioned to clearly mark the ali'i role in supporting pelagic fishing and in managing the fisheries. Even before the formal tabu abolition, the ritual duties involved in the fishing tabus had become too burdensome for the ali'i, and too much in conflict with their new role vis-a-vis the world market system.

As discussed in chapter three food tabus also limited access to certain kinds of fish. No information was found which specifically related to fish tabus, although there is considerable evidence that food tabus in general were frequently ignored. This is specifically true of those tabus which related to women eating pork. As early as 1793 Manby discussed the foods tabued to women and noted that "When on board the ship a few of them would shut themselves up in a cabin and regale most heartly on the forbidden eatables" (22). Townsend in 1798 recorded that women could not eat pork, plantains and coconuts, "but I found the women very glad to eat any of those articles if they were out of the reach of detection" (15).
Iselin recorded the same food violations by women in 1807 (76). Campbell also discussed the food tabus, and noted that "the women very seldom scruple to break them, when it can be done in secret; they often swim off to ships at night during the taboo; and I have known them eat of the forbidden delicacies of pork and shark's flesh" (136). While violations of food and other behavioral tabus apparently occurred quite frequently, offenders could be punished severely. Kotzebue (in 1816) saw the body of a woman floating near his ship, and was told that the woman had been killed "because she entered the eating-house of her husband in a state of drunkenness." However, Kotzebue also added that women, "when they know they are unobserved, make no difficulty of transgressing the many prohibitions to which they are subject" (249-250).

In 1818 Golovnin recorded that high male ali'i in particular frequently broke the periodic tabus which applied to male pork eating, although according to him the women were not as likely to break food tabus. Nonetheless, clearly the traditional food tabus had been seriously weakened by 1819. While tabus on fish were a minor aspect of these food tabus, it can be inferred that such tabus also were frequently ignored, at least by ali'i and those commoners in frequent contact with westerners.

Major changes had therefore already occurred in the the social relations of production with regard to access even
before the 1819 abolition of tabus. The traditional world view, which had considered the ocean as merely an extension of the land, part of the same productive unit and subject to the same type of joint usage as the land, had been altered. The fisheries attached to the ahupua'a may well have diminished as ali'i withdrew their interest and involvement in benthic and pelagic fishing. Religious tabus which restricted access, particularly those concerned with the annual religious cycle, were frequently altered or ignored.

Non-traditional methods of limiting access were introduced, although it is impossible to say how extensive such methods were. These included a prohibition on taking young fish, and a monetary payment for the right to fish in a particular area. Traditional means of controlling access, by forbidding any fishing in particular areas, may well have been extended in response to overfishing in the inshore zone. Such overfishing may have been caused as much by a change in ali'i allocation and organization of labor as the partial collapse of the traditional system limiting access.

Allocation of Labor

In the traditional system of allocation, ahupua'a, district, and island chiefs had been responsible in part for the support of the specialized benthic and pelagic fishermen. Head fishermen were provided with nets, fishhooks, and canoes, all items that potentially could be difficult for fishermen to obtain without chiefly
assistance. The head fisherman directed cooperative fishing operations, many of which were initially organized by the ali'i. This system did not disappear during the early contact period, but significant changes did occur.

Materially, as already noted, the interests and needs of both the ali'i and the westerners indirectly competed with the needs of the fishermen. Pearl shells and olonà line, both vital to the fishing industry, were now a minor commodity that ali'i could trade for items which only they consumed, such as clothing, gunpowder, and western ships. Canoe manufacture became dependent on metal tools to which Hawaiians had access only through their continued participation at the fringe of the world market system. The construction of ocean vessels became increasingly dominated by the construction of western-style sloops and schooners, which were not used for fishing. The manufacture of double-canoes may have all but ceased by 1818 (Golovnin 220).

Ali'i were directly involved both in the intensification of the land production and in the organization of labor for sandalwood collection. In contrast, the demands of the western traders provided no motivation for any comparable intensification of production in terms of the maritime resources. The land and the sea had been viewed as an interrelated unit of production, under the direction of the ali'i. In the period between 1778 and 1819, the ali'i began to withdraw from their participation in ocean production.
This withdrawal was neither abrupt nor complete, and certain reorganizations of the labor force attributed to Kamehameha probably made the change even less noticeable. According to Kamakau, Kamehameha attempted to centralize all fishermen and related craft production. All ali'i nui from the of time 'Umi-a-Liloa were credited with the division of crafts (including fishing) and the organization of fishing activities. Kamehameha, however, appointed two men as "head men over all the fishermen" (Ruling Chiefs 176). Kamehameha's involvement in fishing, which was often very personal, could be considered an attempt to replace the declining involvement of local ali'i in maritime production with a system of state control. Ultimately, probably even before his death, the attempt was a failure.

Kamehameha's care for his fishermen, and his personal involvement in fishing, are recorded by several indigenous historians. John Ii, a member of the royal court in the decade prior to Kamehameha's death, noted that

Kamehameha was often seen fishing with his fishermen in the deep ocean, where the sea was shallow, and where fish-poison plants were used. He took care of the canoe paddlers who went out for aku fish, bringing in supplies from the other islands for them, and sent ships to-and-fro fetching nets, lines olona fibers, and other things. Part of his goodly supply of such necessities he divided among his chiefs and among those he had conquered. Because of his generosity, all his chiefs worked too and gave him a portion of the products of their lands. (69)
Implicit in such accounts is the fact that Kamehameha monopolized access to all resources critical to benthic and pelagic fishing, that he kept his personal fishermen well supplied, and that he did redistribute some of "his goodly supply" to other chiefs. Once again, this appears to be an attempt to centralize fishing activities by control of related resources.

Yet much evidence has already been presented which indicates that between 1778 and 1819 the ali'i gradually withdrew their involvement in organizing labor for benthic and pelagic fishing. This was true even though only one technique which traditionally depended upon the organizational activities of chiefs was abandoned totally, that of deep sea shark fishing (Beckley 11). The fact that the ocean produced little that ali'i could utilize for trade, that double-canoe manufacture decreased, that obtaining sandalwood became an activity which required more and more ali'i organization of labor, all lead to the inference that benthic and pelagic fishing suffered. Direct evidence for this, however, does not occur until the 1819-1850 time period.

Traditionally ali'i had also organized the labor involved in fishpond construction and maintenance. According to Kikuchi, during the years between 1778 and 1819, three new fishponds were constructed. One was started in 1791 in Ka'u by a subsidiary chief of Kamehameha, who was
subsequently killed by his subjects for being too overbearing. The remaining two fishponds were constructed by Kamehameha himself. He began building a pond on Moloka'i in 1795 and another on Hawai'i in 1810 (185-86).

Kamehameha, at least, was also interested in the repair and maintenance of the fishponds. Kamakau recorded that ten thousand men and women worked for months to repair ponds on Maui and Hawai'i (Works 47). Many and perhaps most ali'i were also concerned with the productivity of the fishponds, in terms of both the supernatural and practical aspects. Ii observed the performance of an annual or biannual religious ceremony concerned with maintaining productivity (29). In practical terms, fishponds also needed to be cleaned to insure productivity, and Marin recorded that Boki cleaned one of his fishponds shortly after Kamehameha's death (Gast 238).

It may be however, that the continued activity of ali'i in fishpond construction and maintenance was motivated by an increased need to rely on the fishponds rather than pelagic fishing to feed their entourage. In chapter three the argument was made that traditionally the commoners benefited from the fishponds, and that none of the fishpond types were strictly objects of conspicuous consumption by the ali'i. If valid, then the 1778-1819 period was when at least some types of ponds became more and more the private property of the ali'i. This change may have been necessitated by the
practical concerns of providing fish for the royal court and maintaining at least some of the required chiefly largess.

**Redistribution**

However, fishponds may have continued to have importance in the traditional system of redistribution. Those westerners who described the fishponds between 1800 and 1819 do not for the most part describe the ponds as though they were the exclusive property of chiefs.

One example is Kotzebue, who described the fishponds he encountered on an 1816 trip to the prohibited pearl fishery of Pearl Harbor.

The taro fields afford another advantage; for the fish which are caught in distant streams thrive admirably when put into them. In the same manner as they here keep riversh, they manage in the sea with sea-fish, where they sometimes take advantage of the outward coral reefs, and draw from them to the shore a wall of coral stone, which makes, even in the sea, good reservoirs for fish. Such a reservoir costs much labour, but not so much skill as the taro fields, where both are united. *(Voyage 340-41)*

At least one visitor believed that the ponds were constructed to alleviate the shortage of fish, and hence obviously believed fishpond production was available to everyone. Freycinet noted in 1819 that "The steep shores of the Sandwich Islands are not generally suitable for net fishing, but the inhabitants have long since constructed numerous shore ponds that connect at intervals with natural lakes and furnish a fairly good supply of fish for local needs" (83).
Nonetheless, prior to 1819 there is evidence that at least some fishponds were now the exclusive property of particular chiefs. The most explicit account was that of John Whitman, who spent most of 1814 on O'ahu. On a visit to the district of Waialua, he described several large fishponds, including one particularly large one with a mile-long sea wall.

Walking over the wall we passed several gates of strong wicker work through which the water had free passage. Here we observed thousands of fish some of which were apparently three feet long. A small hut at one end of the wall is the residence of an old man who guards the fish. This pond is the property of the King and no fish are allowed to be taken out of it without his orders, and there had not at this time been any taken out for several years. (Holt 78)

Fish, including fish from fishponds, were used to pay tax and tribute during this time period, and presumably were redistributed at least among the entourage of the ali'i who collected the tax. John Ii described an incident that occurred on O'ahu in the early 1800s, where a "tribute" of fish from a pond was given to one of Kamehameha's sons. The catch was "so large that a great heap of fish lay spoiling upon the bank of the pond." Kamehameha was angered at the waste, but unlike some of the legendary accounts previously recorded, no call went out for people to come and take what they wanted. Instead, the king ordered the remaining fish to be released as a punishment of the offending ali'i (49).
Fish, particularly dried or salted, are mentioned several times as being part of the taxes collected for Kamehameha and other ali'i. This in itself is evidence that offshore fishing directed by ali'i was not totally sufficient to provide for their own entourage. In 1814 Whitman and another seamen journeyed to Waialele to take possession of a small "estate" which had been given to Whitman's companion. The "old superintendant" told them that he annually paid as taxes to his ali'i goods which included "two hundred large salted fish" (Holt 79).

Marin reported in November of 1815 that everyone in Honolulu was out fishing in order to send dried fish to the king (Gast 218). In December of 1815 Barnard's ship transported fifty Hawaiian "collectors of taxes and receivers of rents" from Kona to O'ahu (219). Later, the ship carried the tax back to Kona, and Barnard reported that it consisted primarily of tapa and dried fish (221). Presumably, some of the fish are the same ones Marin observed being caught and dried a month earlier.

Kamehameha and probably some of the older ali'i continued to maintain an image of chiefly largess, despite the fact that much of the land production was redirected into trade for western articles. The western articles on the whole were not redistributed. Nonetheless, basic foodstuffs, including fish, continued to be distributed to the followers of each ali'i, and also to very poor
commoners. In addition, ali'i supported the foreigners attached to their households, and poor unattached foreigners as well. Faced with a continued if not growing need for fish solely for this purpose, together with a dwindling supply from ali'i directed benthic and pelagic fishing, the chiefs appear to have responded in two ways. First, fishponds became more exclusively the private domains of particular ali'i. Secondly, salted and dried fish became an acceptable form with which to pay annual and ultimately semiannual taxes.

Some of these fish were given to foreign residents by the ali'i. Iselin in 1807 thought that most of the whites on O'ahu were quite poor, and reported that "The king and Teremotoo [Kalaimoku] at times distribute them some fish; this is one of their great articles of food (of the natives generally,) though not always plenty ..." (78). Besides hinting at a possible shortage of fish on O'ahu, the passage indicates that Kamehameha apparently maintained the traditional ali'i stance as provider for the poor, and simply added the category of poor whites. He also gave frequent gifts to richer and more useful whites such as Marin, who after 1809 recorded frequent gifts of fish from Kamehameha and Kalaimoku (e.g. Gast 210-211). This was true even though Marin also fished for himself and sometimes accompanied the king on fishing trips (Gast 199).
In summary, by 1819 the social relations of production had changed in significant ways. Access to fishing resources in general had been broadened, in part by the probable decrease in the extent of fisheries that were viewed as extensions of the land. In addition, religious tabus, including those involving food, had been altered or were frequently ignored.

Ali'i were much less interested in organizing and supporting labor for benthic and pelagic fishing. At least one deep sea fishing method dependent upon ali'i involvement had been discontinued, and other ali'i organized benthic and pelagic fishing probably decreased. In addition, Kamehameha acquired almost exclusive access to the available supply of pearl shell and olona fiber, which was needed for western trade as well as support of the fishing specialists. The lack of ali'i support for benthic and pelagic fishing caused more dependence upon inshore fishing, although Kamehameha attempted to replace the traditional system with a state-organized productive system.

Ali'i, to some extent still bound by the forms of kinship, continued to be redistributive chiefs at least to their ever increasing personal entourage, which now included foreigners. In order to compensate for the decrease in benthic and pelagic fishing, certain types of fishponds became more and more the exclusive property of ali'i, and dried and salted fish became a common tax item. It is
unlikely that most commoners were beneficiaries of the redistribution system.

In 1819, the event occurred which enabled ali'i to break all ties with the kinship mode of production. As a result of the tabu abolition by Liholiho, ali'i ceased using kinship and religion to strengthen their position. They moved from being "an incipient class of surplus takers in the tributary mode" to a full-fledged class of surplus takers (Wolf 97). In the process, several aspects of fishing were severely effected.

THE KAPU ABOLITION OF 1819

Kamehameha died in May of 1819, having named his son Liholiho as his successor and his nephew Kekuaokalani as the guardian of the god Kuka'ilimoku, splitting the responsibilities as Kalaniopu'u had done in 1782. Ka'ahumanu, one of Kamehameha's wives, announced that the dead king had also wished her to be co-ruler with Liholiho under the title kuhina-nui. By November, the traditional period of tabu suspension following the death of a ruler had still not been reinstated. Instead, Liholiho ate with Ka'ahumanu and other women, and shortly thereafter ordered the destruction of the temples and god images.

Marin recorded the arrival of messengers with these orders in Honolulu on November 6, and noted that on the following day "churches" were burned and the women began to eat pork (Gast 234). Similar events happened throughout the
kingdom, although many heiau and images were not destroyed.  
Only two major protests occurred. One was led by Kekuao­kalani; the second was apparently composed entirely of commoners in the Hamakua district. Both uprisings were quickly suppressed, and the formal supernatural support for traditional Hawaiian culture was gone (Caroline Ralston 30; Kuykendall 61-70).

Liholiho ruled the kingdom as Kamehameha II, but in fact shared power with his kuhina-nui, Ka'ahumanu. Almost all ali'i acquiesced in this new regime, perhaps because Liholiho agreed both to give up the royal monopoly on sandalwood and to permit existing ali'i to keep their land without the reallocation that traditionally followed the death of an ali'i nui.

Even prior to 1819, there had been a number of changes in the tabu system. The changes relevant to the maritime mode of production, including food tabus, have already been discussed. Westerners recorded many additional examples of change in traditional religious behavior.

Bell, who visited in the early 1790s, was told by Issac Davis that upon the death of a chief Kamehameha had prohibited any human sacrifice or "debauchery" as part of the funeral ceremony. Although Bell was suspicious that this prohibition was only due to the presence of the ships, he noted that "human sacrifice" had become rare under Kamehameha's reign (90).
Over the next decades, other westerners recorded instances where traditional practices had been altered. Most date from the four year period between 1815 and 1819. In 1815, Whitman noted that although people generally were careful not to violate religious tabus, minor offenses were no longer punished by death (Holt 22). In the same year Corney also recorded various tabus, but remarked that "The Sandwich Islanders have entirely abolished human sacrifices" (198). Both Chamisso in 1816 (qtd. in Kotzebue, Voyage 247-48) and Golovnin in 1818 (208) also recorded that only criminals condemned to death were executed in the temples.

After Kamehameha's death in 1819, Freycinet was told that in the recent years, minor tabu violaters were required to pay small fines. The example provided of a "minor" violation was of a woman breaking the food tabus (89). Freycinet cited other examples which indicated that ali'i at least were in the process of evaluating the appropriateness of the traditional tabu system. Two involved the high chief Kalaimoku. Many Hawaiians seen by Freycinet and his crew had recently broken off one or more incisor teeth as a symbol of mourning for Kamehameha. Kalaimoku had not however, and when asked why replied: "The number of madmen is already large, I did not want to increase it" (77). Later, this same chief requested (and received) baptism as a Christian (28).
Nonetheless, such indications of change, together with those previously mentioned which specifically involved fishing, would probably not lead to any prediction that Hawaiians were about to discard an entire religious system. In fact, the Hawaiians as a culture probably did not. While the ali'i discarded the formal rituals, tabus, and religious calendar, the commoners continued with their religious practices much as before, to the consternation of the missionaries in the 1820s. Caroline Ralston is probably correct in her analysis that "this religious upheaval was less intrusive and traumatic than the later enforced conversion to Christianity, which occurred after 1824" (30).

It still remains true however, as one anthropologist noted, that "a people's abandonment of their traditional religious practices--not in favor of a new cult, but in exchange for nothing--is a highly unusual event ..." (Webb 21). As a result, much has been written on the causes of what is often called a "cultural revolution."

For those who emphasize the "revolutionary" effects of the tabu abolition, the impression is often given that traditional Hawaiian culture had continued intact under the reign of Kamehameha I (e.g. Handy; Harfst). Considerable evidence has already been provided to indicate that on the contrary major changes had already been made. Politically, Kamehameha had utilized his control of western trade to unite the islands under a centralized rule. Economically,
the ali'i as a group had begun to act like an elite social
class, controlling the production system for their personal
aggrandizement. Materially, in critical ways, Hawaiians had
become dependent on goods and skills supplied primarily by
America. In addition, the ali'i had begun to use western
goods, frequently true luxury items, as major symbols of
their rank and status. As a consequence, kinship even in
form was no longer the basic unit of production and
consumption, and Hawai'i was clearly in a tributary mode of
production. In fact one of the few remaining supports for
the kinship mode was the religious system itself.

Political analysts (particularly Davenport and Webb)
have described the events of 1819 as "a structural
convulsion by which the Hawaiian political system was
transforming itself into true statehood" (Davenport 18).
Davenport went on to state that the tabu abolition "was ...
a deliberate political response to a political crisis." The
political crisis was clearly also an economic one, since the
requirements of participation in trade relationships with
America made it difficult for the chiefs to organize labor
and redistribute resources in the traditional manner and for
traditional purposes.

Seaton also emphasized this aspect of the tabu
abolition. The ali'i decided to terminate "the sanctified
core of the political division of labor, thereby freeing the
court from traditional obligations ..." ("The Hawaiian Kapu
Abolition" 204). Certainly the evidence presented in this chapter would indicate the incompatibility of the acquisition of western goods and the traditional obligations of the chief. Long before the formal abolition of the religious system, chiefs had failed in their obligations as elder kinsmen whose authority derived from their more direct descent from supernaturals.

Nonetheless the specific results of the tabu abolition on the maritime mode of production were significant. In the area of the social relations of production, certain restrictions on access had now disappeared entirely. Canoe fishing was no longer prohibited during the four monthly periods set aside for religious worship. The fishing tabus associated with the Makahiki festival and the ten day tabus associated with the opening of the aku/'ōpelu fishing were abolished. The alternating six month tabus on those two fish disappeared as well. The tabus which prevented women from eating certain fish and other marine products also were abolished. Individual or family 'aumakua continued to be honored however, and presumably food tabus associated with particular 'aumakua were still kept. Yet several methods of limiting access, probably quite important in their cumulative effect, had now disappeared. Whatever conservation value they had had (consciously or unconsciously) was also gone.
It is quite probable that certain types of knowledge disappeared at the same time. The priests of Lono were the traditional keepers of the lunar calendar which regulated both agricultural and fishing activities. As previously noted fishing activities were probably tuned to the lunar-regulated spawning season of different fish species. The priests no longer kept such a calendar or the associated knowledge of marine ecology. As a result, one of the basic mechanisms by which such knowledge was transmitted disappeared.

There was probably little direct effect on allocation and redistribution as a result of the tabu abolition. As already noted, many ali'\'i already acted in a very non-traditional manner in these two areas prior to 1819. By removing even the ritual obligation to provide appropriate fish for religious ceremonies and to oversee the aku/'ōpelu religious cycle, the ali'\'i became even less directly involved in the maritime mode of production. In addition fish ponds could now be treated as private property without any restraint. In Seaton's words, the commoners had now completely lost their "sanctified production-redistribution-consumption system" ("Hawaiian Kapu Abolition" 204). This does not mean that all religious beliefs associated with fishing disappeared. Not only personal fishing 'aumakua, but worship at fishing shrines and many other religious rituals concerned with fishing continued after 1819. But
As a result the Hawaiian maritime system of production was even more vulnerable to change. Externally, 1819 brought three other events which were to ultimately have dramatic effects on the Hawaiian relationship to the sea. A shortage of specie in the United States meant that traders after Hawaiian sandalwood and provisions had to work harder at instilling the value of endless need into the ali'i. In 1819 American whalers first visited Hawai'i, and the "Japan grounds" were discovered which would bring many more. Finally, 1819 was the year that the first American missionaries set sail for the islands, their extraordinary success almost assured by the major cultural changes that had taken place since 1778.
CHAPTER FIVE
SURRENDER TO THE WORLD-SYSTEM: 1819-1850

INTRODUCTION

During the thirty year period which began in 1820, the number of foreign ships visiting the Hawaiian Islands each year increased dramatically. Like the previous twenty-five years, the ships were primarily American, but now most of them were whale ships (Morgan 79). The number of permanent foreign residents also increased after 1820, and for the first time included a significant number of women. Although the total number of non-Hawaiian residents was never very large (as late as 1853 only two percent of the population) they were predominately American and wielded an influence entirely out of proportion to their actual numbers (Schmitt, Demographic Statistics 12; Bradley 265-266). Many were missionaries from New England, but others were traders who used their Hawaiian base for a variety of commercial endeavors in the Pacific.

The historian Harold Bradley described the American presence in Hawai'i as an "economic" or "commercial frontier," and has claimed that in the two decades after 1820 the United States began an "economic conquest" of the islands (269). As discussed in chapter four, by 1820 Hawai'i had already evolved into a political state, changed its mode of production, and renounced the religious base of the traditional social relations of production, so that
Bradley's dates seem rather late. The concept is valid however, and the changes which occurred in Hawaiian culture between 1820 and 1850 could be viewed as completing the transformation to a capitalist mode of production.

Since few Americans ever lived in Hawai'i relative to the indigenous population, this "frontier" in Hawai'i was never a physical one. Obviously the "conquest" was not physical either. While the threat of force in the shape of occasional ships of war was a real one, America used this threat very rarely as compared to both France and England. The transformation of Hawaiian culture which took place after 1820 did not technically result in the loss of either land or sovereignty.

Yet a "conquest" had occurred. The traditional relationships between people and the land and sea were fundamentally altered during this time period, and by 1851 were legally defined in a manner consistent with that practiced by the United States. Relationships between ali'i and maka'ainana were transformed also, and at least in the case of the maritime production system it will be shown that the result was an actual decrease in production. As part of this transformation the government became a western-style constitutional monarchy under significant American influence. This happened with only a threat (however real) of force. While an economic transformation frequently accompanied the spread of the capitalist world-system into
other areas of the world, Hawai'i may be an example of the concept at its purest.

While Hawaiians technically retained sovereignty over the islands in 1850, the cultural price paid was enormous, and a major area affected was the mode of production. Regardless of what label might be applied to the internal aspects of the mode of production in Hawai'i, by 1850 the Islands had become enmeshed in and transformed by the capitalist world-system. Two major factors were involved in this transformation. One was the increasing importance of Hawai'i to the United States' involvement in the market system, particularly as America became the major world provider of whale-derived products. The second was the continued interest of the ali'i in participation in that system. Both these factors will be discussed later in this chapter.

As noted in the previous chapter, foreigners visiting or living in Hawai'i had from the beginning tried with varying degrees of persuasiveness to modify Hawaiian culture. Yet during this second period of cultural contact, the attempts were more deliberate and often surrounded by lengthy attempts at rationalization. During this period, not only were Americans the dominant numerical and economic influence in Hawaiian culture, they were also major recorders of events. Unlike the earlier time period, Americans wrote extensively about their own activities as
agents of cultural change. Their writings reveal the emerging consciousness of an American role in helping to "civilize" the world.

In Hawai'i whalers, traders, and missionaries alike all noticed the effect their activities had on the Hawaiians, and could not help but notice that the effect even by their own criteria was often negative. The major concern was that the standard of living for many maka'ainana declined after 1820, and the indigenous population continued to decrease. Resident traders and many non-American visitors tended to blame the missionaries for this, while the missionaries tended to blame the whalers and traders. Ultimately, there was an increasing tendency to blame the Hawaiians themselves. In some cases, the blame was placed primarily on the ali'i, who from the American perspective frequently were obstacles to cultural change. Commoners were to blame as well, however, and both traders and missionaries agreed that major changes were needed in Hawaiian culture.

Two of the changes on which there was general agreement involved the mode of production. First was the need to increase individual Hawaiian desire for material goods of foreign manufacture, and to extend that desire from the ali'i to the maka'ainana. Second was the necessity for individual ownership of land and common ownership of the sea to increase the productivity of both. These two traits
represent perhaps the most fundamental value and the most important structural element of American capitalism.

After 1820 the American goal was to "civilize" the Hawaiians, and the incorporation of these two traits was viewed as a major sign of success. The physician M. D. Ruschenberger, who visited Hawai'i in 1836 with the U.S.S. Peacock, described missionary efforts at civilizing the Hawaiians with approval, but noted that "commerce is actually the great civilizer of mankind" (351). Most missionaries in Hawai'i agreed, and in the same year petitioned their governing board for forty-six "missionary laborers" skilled in "agriculture, manufactures, and the various methods of production ..."(qtd. in Bingham 492).

A major step towards civilization would be an increased desire for material goods. Charles Wilkes, captain of America's first scientific expedition, which visited Hawai'i in 1840, described the maka'ainana in Waialua as follows:

> These people are as indolent as usual, having but few wants, and those easily supplied; there is now, however, some hope of their improvement, because the conveniences of civilized life are gradually being introduced, the desire of obtaining which gives them an incentive to exertion. (4: 75)

F. W. Beechey, captain of the H.M.S. Blossom, had visited the islands much earlier, in 1826, but had made the same connection. He noted the great "improvement" which had occurred in Hawaiian culture since discovery, and stated that it was due primarily to "commercial activities," in
particular the increased "desire for dress and luxuries" which had been created in the people by their contact with foreigners (2: 97). Sir George Simpson, who visited Hawai'i in 1841 on behalf of the Hudson Bay Company, noted with approval that "sleepless avarice, ... one of the earliest results of the contact of civilization" was present in Hawai'i, and helped "to strengthen and direct industry." Simpson thought that "all classes" in Hawai'i had become, "as is natural and excusable, ardent worshipers of money, as the one thing needful, in their opinion, for procuring all that distinguishes civilization from barbarism" (1:267).

While Simpson did not consider "sleepless avarice" a sufficient quality for civilization, it was a necessary ingredient.

The American protestant missionaries did not really disagree. Many of the changes they sought to create were material ones, and dependent on changing the approach to material goods among the commoners. The Frenchmen Duhaut-Cilly, who visited in 1828, characterized the missionaries as "mercantile types" and wanted to introduce French Catholic missionaries as a "counterbalancing force to the materialism and self-interested practices of their competitors" (23-24). The American missionary Laura Judd, who arrived the year of Duhaut-Cilly's visit, exemplified one major material change sought: "I shall use all my influence to increase the sale and use of American cottons" (8).
Missionary C. S. Stewart left Hawai'i in 1825 and returned in 1829 as chaplain aboard the U.S.S. Vincennes. He described in minute and glowing detail the material improvement in the ali'i, particularly their dress and household furniture. As one of many possible examples, Stewart noted that after an official visit to the king with the Vincennes captain, they were served wine "in a superb set of cut glass--stained and ornamented with cameos in white--on large trays of silver plate" (Visit 2: 131). Immediately following this statement, Stewart expressed amazement at the great strides made toward civilization since his earlier residence.

With regard to the commoners, the missionaries often linked their poor standard of living and their failure to improve materially to their indolence. Missionaries on Maui in 1831 complained that many Hawaiians "spend their time in almost perfect idleness; the consequence of which is that they have what you would consider a very scanty supply of food ... [They] make no account of time. That time is valuable, is one of the hardest lessons for a heathen to learn" ("Joint Letter of Missionaries on the Island of Maui" 250).

Yet the missionaries also believed that commoners would work harder if they could be brought to want more, and hoped that their increased wants would thus improve them both materially and morally. Missionary Ephraim Clark wrote in
1848 that "Indolence here, as everywhere, has a debasing influence on the moral and physical condition of the people. It is the mother of vice and disease. As artificial wants increase, the character of the people is generally elevated" (Answers 6).

As should be evident from the previous chapter, it was the maka'āinana whose "artificial wants" needed to be increased, not the ali'i. Wilkes, whose views on Hawai'i were heavily shaped by the missionaries, saw the problem as follows:

A native's [commoner's] idea of luxury does not extend beyond poe [poi] and fish, with which he usually seems satisfied, and when they are obtained ceases all exertion. To overcome this inertness, it is requisite that they should, as some few do, feel artificial wants, which causes them to look about for employment. (4: 220)

James Jackson Jarves, in one of his last editorials for The Polynesian on January 1, 1848, explained it somewhat more poetically. He noted the problem with the Hawaiians "is not that every native doesn't have a chicken for his pot--all do--but they have no pot, or chair, or table, or tablecloth...." More importantly, they did not want these things, and "new wants" in Jarves' phrase, were necessary. These wants could be created by "the introduction of capital and the establishment of ... farms and plantations" run by foreigners ("Editorial" 130). In other words, the implementation of land reform.
Both traders and missionaries agreed that the system of land ownership in Hawai'i had to be changed to private ownership, and that all property (after reasonable taxes) should be secure to the individual. The missionaries considered the change necessary in order for Hawaiians to have motivation to work hard and improve themselves, materially as well as in other ways. Stewart noted that "One of the strongest inducements to exertion--that of a right of property--is entirely unknown. Were not this the case, the profit which every farmer might derive from the visit of ships for refreshment, would soon cause the face of the country to assume a new aspect" (Journal 151).

In 1828 members of the mission noted that no improvement in "industry" could be expected until there was a change in government, since "The tenure by which property is held is so feeble ... that no strong motive to industry can exist, unless it is to obtain learning and religion ..." ("Extracts" 209). Later missionaries complained even more strongly about the "despotic" government where everything of value belonged to the chiefs and the people had to endure an arbitrary system of taxation. "Until the government shall show a disposition to encourage the acquisition of property by the common people, there can be little hope that civilization will make rapid progress" ("Letter of Messrs. Thurston and Bishop" 372).
Traders and other foreigners were more concerned in securing lands in fee simple for themselves, although they often believed as did Jarves that the result would benefit the Hawaiians. Simpson noted in 1842 that the sugar operation of Ladd & Co. (operating on land leased from the government) averaged a ton and a half of sugar. He expressed the general hope of foreigners in Honolulu that the land would soon be "free for the operations of the capitalist..." and discussed the possibilities of sugar, silk, cotton, rice, tobacco, and coffee as potential exports from Hawai'i in the future (2:45-47).

The bitter arguments between missionaries and the traders in Hawai'i as to the exact course of cultural change were real, but may have been overemphasized. At the time they were exacerbated by the English translation and American publication of the Russian Kotzebue's second visit to the Islands in 1825 (A New Voyage), in which he denounced the changes he saw in Hawaiian culture and laid the blame on the missionaries. Whalers and traders, who saw their personal and financial interests impeded by the missionaries, were quick to try and gain sympathy for their view by blaming the missionaries for the obvious decrease in the commoner's standard of living. The differences between the two groups were obvious, and almost every visitor remarked upon them. Commenting in 1842 on foreign social life in Honolulu, Simpson noted that "the whole place is cut
up into such minute subdivisions, that a visitor is perfectly at a loss how to act, being almost afraid to mention where he has been or whither he is going" (2: 62).

Yet as noted above, the values of missionaries as well as whalers and traders were the values of the capitalist mode of production. The changes all wanted to see in Hawaiian culture were changes consistent with that mode of production. In a broader and more distant perspective, they did not fundamentally disagree. In that sense, the "frontier" they established in Hawai'i was an economic one, and their "conquest" was also economic.

One result of their combined activities was the final destruction the maritime production system, and the beginning of environmental depletion of the inshore zone. This is true despite the fact that few of the conscious attempts to change Hawaiian culture were directed specifically at the ocean. It is also true despite the fact that most Hawaiians continued to fish, and most of them continued to fish using traditional techniques. Fishing magic continued to be practiced, and the fishermen's dieties continued to be honored. By 1850, however, the system of which these techniques and practices were an integral part no longer existed.

There is evidence for the first time of a true shortage of fish at many times and in many places during the years after 1820. The reasons for this shortage are complicated,
and will be addressed in some detail later in the chapter, but certainly involved environmental change, overfishing of the inshore zone, decreased fishing of the benthic and pelagic zones, diversion of labor into other occupations, and the actual loss of important information on fish habits and habitats. As will be discussed, the population of the islands decreased, quantities of fish including dried and salted aku and 'ahi were imported, yet still there were complaints of an inadequate supply.

Predictably, Americans blamed the system of joint (ahupua'a) ownership of the fisheries, and encouraged its abolition to "free" the ocean and make it more productive. Significant steps were made after 1839 toward this goal, although some inshore fisheries were not legally common property until after annexation and traces of the traditional system remain to the present (see Kosaki).

The legal changes in fishery ownership which occurred between 1839 to 1850 were significant and will be discussed in the last section of this chapter. In addition to changing the way in which fisheries were owned, the changes made it impossible for any ali'i to continue to provide for their skilled fishermen in the traditional manner. This support had enabled young fishermen to learn the biology of fish and the craft of catching them in benthic and pelagic waters, as well as maintaining the traditional technology of fishing. The legal changes also made it impossible for
ali'i to easily organize labor for certain group fishing techniques and for fishpond construction and cleaning.

Prior to the legal changes, as will be discussed, ali'i and in particular the king sought to support their entourage and the governmental structure by excessive taxation of the fisheries and by continued restriction on particular fishponds. At least some ali'i sold fish from their ponds commercially, but ultimately many ponds were abandoned, filled in or allowed to revert to marshland, or leased to others who were often non-Hawaiian.

While as noted many Hawaiians continued to fish, and to fish using many traditional techniques and practices, by 1850 they were part of a money market economy, part of a culture connected inextricably to a world market system. Their traditional system of joint ownership of ocean fisheries had been legally changed, and along with it any trace of the traditional reciprocal relationship between ali'i and maka'ainana. These changes were but a reflection of the change in the total culture. By 1850, Hawai'i had been altered sufficiently so that its history for almost the next hundred years would read like a classic case of "the development of underdevelopment" (Frank).

POLITICAL AND DEMOGRAPHIC BACKGROUND

Political, economic and demographic events form the critical background for changes in the maritime productive system between 1820 and 1850. Politically the state moved
even further away from any resemblance to the traditional system of reciprocal obligations between ali'i and maka'ainana, even though there were individual ali'i exceptions in the early years. Most of these changes took place under the reign of Kamehameha III, who became king after his brother's death in London in 1824 and ruled until his own death in 1854. It was with the agreement of Kamehameha III, as well as other ali'i, that the Hawaiian government was transformed into a typical western-style constitutional monarchy by 1840.

The expansion of the sandalwood trade in the 1820s and the rapid growth of the whale trade throughout this period represented the major means by which Hawai'i maintained its involvement with the world market. Both these activities were dominated by Americans (Morgan, Chaps. 4 and 5). Because of the continued importance of the Pacific generally to core nations, and because of the particular importance of Hawai'i to America, the islands were frequently visited by foreign ships of war. Many of these events affected maritime production and will be briefly discussed.

The export of sandalwood increased dramatically in the 1820s as ali'i sought a commodity with which to purchase western goods. In 1821 at least 30,000 piculs of wood was sent to China and sold for at approximately $300,000, an amount typical for the early part of the decade. With such potential for profit, American traders in the islands were
quite willing to sell to the ali'i on credit. When the debts were not paid, trader complaints brought the first American warships into Honolulu. Aggressive efforts by ali'i to pay their debts and to maintain their consumption level resulted in the virtual extinction of sandalwood by the mid-1830s (Morgan 64-67).

As noted in chapter two, after 1815 whaling became primarily an American industry. Since whaling practices rapidly depleted the whale grounds, profitable whaling depended upon the periodic discovery of new grounds, and even before 1820 such grounds existed only in the Pacific. The discovery around that year of the "Japan grounds" off the coast of Japan, coupled with the fact that whalers were prohibited from provisioning in Japanese ports, greatly increased the economic importance of Hawai'i to America (Morgan 76-77).

Immediately after the discovery of the Japan grounds, Hawai'i began to provision whale ships, and the whalers came in much larger numbers than had ever been true of the fur traders. Whalers needed not only fresh food, water, and wood, but all types of ships stores and materials to repair the vessels themselves. Gilbert Mathison visited Honolulu in 1822, and found that sixty whalers had anchored in the harbor during the spring. The ali'i had brought large quantities of provisions in from the outer islands and other parts of O'ahu to supply the ships (459). While ports like
Honolulu and Lahaina were more frequently visited by the whaleships, British missionaries Daniel Tyerman and George Bennet saw twelve American whalers at Kealakekua Bay in March of 1822, with seven more attempting to gain entrance (99).

Although there was some fluctuation from year to year, the average number of visits by whalers increased throughout this time period. From 1824-1826, the average was 104 ships a year; for the next six years 172 ships. After the discovery of new whaling grounds in the arctic over 400 whaling ships a year, almost all American, visited Hawai‘i from 1843 to 1850 (Kuykendall 307). Provisioning the relatively few fur traders prior to 1820 had already altered the productive system on land, and had indirect effects on the ocean, as discussed in chapter four. As will be discussed in this chapter, provisioning the much larger number of whalers (particularly with a decreasing population) helped to further change the land and ocean productive systems.

The United States began its first formal relationships with the Hawaiian government in 1820, when the American trader John C. Jones Jr. was appointed America's commercial agent. The American government's official interest in the Hawaiian Islands was expressed in other ways during this time period. Russia's activities in the vicinity of the Columbia River were of particular concern to the U.S., and
in 1821 President Monroe reported to Congress on the necessity of maintaining naval forces in the Pacific "for the protection of the very important interests of our citizens engaged in commerce and the fisheries of that sea" (qtd.in Strauss 85). The first U.S. Navy ship to visit Hawai'i arrived in 1826, under the joint mission of capturing mutineers from the whale ship Globe and obtaining payment of merchant debts in Honolulu. Five more U.S. naval expeditions visited Hawai'i before the U.S. Exploring Expedition under Wilkes called in 1840.

Official United States interest in Hawai'i and the Pacific was hence very late and relatively little compared to countries like England, Russia and France whose navies had begun visiting before 1820. Although Russian interest in North America began to wane by 1840, the other powers continued to threaten. French interests posed a danger to the Hawaiian Kingdom in the 1830s and beyond, and English interests also created major problems in the 1840s. Hence despite the dominant American presence and commercial interests, annexation to either France or England appeared a more likely possibility during much of this time period.

French concerns centered primarily on the treatment of Catholic missionaries (who first arrived in Hawai'i in 1827) and the interest of the Hawaiian government in heavily taxing imports of French wines. The French warship L'Artemise under Captain Laplace succeeded in forcing
Kamehameha III to sign an objectionable treaty in July 1839. French concern about advantages Protestant missionaries retained with regard to the school system, as well as import duties and restrictions on French wines, prompted a dramatic episode ten years later. French troops from two ships occupied the fort at Honolulu and government offices and forced an agreement in August of 1849, although the action was later repudiated by France (Kuykendall 390-94).

England was minimally involved in the dispute over Catholic missionaries. Their primary concerns were land transactions which involved British citizens, and the right of the Hawaiian judicial system to try cases involving foreigners. In February of 1843 H.M.S. Carysfort under Captain Paulet forced the cession of the Hawaiian Islands to England. For five months the Islands remained under the rule of a British commission until they were restored to Hawaiian control by Admiral Thomas (Kuykendall 213-20).

Incidents such as these probably made the ali'i more receptive to advice to westernize the Hawaiian government and land holding system. Advice was freely offered, not only by the missionaries but by almost every other foreigner, including American naval officers. J. N. Reynolds, secretary to Commodore Downes of the Potomac (visiting in 1832), noted that Downes gave the king "much good advice as to his behaviour towards American residents on the island, and many hints as to his government" (414).
The U.S.S. Peacock, under Commodore Kennedy, visited in 1836, and the advice presented to the ali'i was detailed by the expedition's physician, Ruschenberger. The king was encouraged to lease more land to foreigners, and to allow them to "buy, sell or exchange any kind of property" since the "improvement of the islands is mainly dependent on trade" (399). The king was also encouraged to fix rent and taxes and to pay for any labor they obtained from commoners, since: "Unless the people are secure in the enjoyment of the fruits of their labour, it will be in vain to attempt to improve their condition" (399).

The latter advice, at least, was not in contradiction to that given by the missionaries. The ali'i themselves were convinced of the necessity to modify the government, and in 1836 requested that a teacher of political economy be provided (Bingham 496). The missionary Board did not send such a teacher, but in 1838 William Richards resigned from the mission to assume that responsibility.

As early as 1827 the ali'i had adopted a "criminal code" (outlawing murder, theft and adultery) and other crimes were later added, particularly in 1835 (Kuykendall 126). Under Richards' tutelage however, change came swiftly. In 1839 the council of ali'i agreed to a declaration of rights and what was essentially a civil code. The next year, a Constitution was adopted, and additions were made to the earlier laws. The Constitution specified
the duties of the king and the kuhina nui, and provided for four governors. In addition, a two house legislature was established, with one house composed of ali'i and the other to be chosen by the people (Thurston 1-9).

The transformation of the Hawaiian government continued throughout the 1840s, even though interrupted at times by foreign disputes. Resident foreigners increasingly were employed by the Kingdom in various positions, and the government also sought to obtain recognition as a nation from the western powers. Bradley has noted that the earliest attempts to secure recognition were a "by-product of the commercial ambitions of individual American speculators in the Islands rather than the result of any anxiety upon the part of either William Richards or the native rulers" (402).

The main issue appeared to be the difficulty of interesting major American investors in Hawai'i unless its independence from America, France, and England could be guaranteed. A newly arrived American, Thomas Farnham, volunteered his services to the government in 1840. In exchange for obtaining American recognition, Farnham hoped for a large lease of land which could attract American speculators. While nothing came of his efforts, a similar scheme was proposed in 1841 by Ladd and Co., an American-owned sugar company which in 1835 had secured a long-term lease of land on Kaua'i. The 1841 agreement involved a
lease on all unoccupied land in the islands if the Ladd and Co. representative (Peter Brinsmade) could gain recognition for Hawai'i from England, France, and the United States. Not until 1842 did the king send Williams and Haalilio abroad to visit all three countries for the same purpose and with more success (Bradley 402-409).

By this time, the most pressing problem in Hawai'i in the view of resident Americans was the need for land "reform." In late 1845, the legislation was passed which created the Board of Commissioners to Quiet Land Titles. The land commission had the authority to decide on the validity of land claims from individual Hawaiians and foreigners, as long as the land had been "acquired" before 1845 (Chinen 8).

In order for the land commission to actually accomplish its goals, the undivided ownership interests of the king, the ali'i and the people had to be separated. From January to March 1848 a major step toward this was accomplished when 245 ali'i signed agreements with the king dividing the lands. The ali'i were required to present their claims to the land commission, and pay a commutation fee in cash or land to the government. Many ali'i did not file their claims, and legislation continued to be passed on their behalf throughout the latter part of the century. Their lands became known as konohiki lands (Chinen 15-24).
Subsequently, the king subdivided his land into what ultimately were called government and crown lands. Chinen has noted that this division was upon the insistence of the king, since he "did not want his lands to be considered public domain and subject to confiscation by a foreign power in the event of a conquest" (25).

Individual commoner claims could now be considered, and the legislation to provide for a land grant with fee simple title to all indigenous tenants was adopted in 1850. Individuals were required to file their claims, and later to appear before the land commission to prove they were actually cultivating their land. After the land was surveyed it could be awarded, and these lands were known as kuleana lands. Many commoners did not file, or did not appear before the land commission before it completed its work in March of 1855 (Chinen 29-31).

As a result, over a million and a half acres became konohiki lands, another million and a half became government lands, and approximately one million acres remained to the royal family as crown lands. Only 30,000 acres, primarily of agricultural land, was actually awarded as kuleana lands (Chinen 31). All of this land could now be sold or leased, and much of it was. Legislation permitting foreign aliens to purchase land had been passed in 1850. Americans, as the major group with access to capital, became the primary buyers or long-term lease holders.
While as noted earlier, the missionary interest in land reform had been to raise the standard of living of the commoners, the result was to alter the culture in ways consistent with the capitalist mode of production. A modern scholar, Neil Levy, has noted that the process basically provided non-Hawaiians with a legal mechanism to take the land. "Western Imperialism had been accomplished without the usual bothersome wars and costly colonial administration" (857). Caroline Ralston has made a similar assessment, and concluded that a major result of the change in land tenure was to "free" the maka'āinana to become wage laborers in "the expanding plantation industry" (31). Even though that plantation system was not to become immediately successful in Hawai'i, after 1850 the social relations of production had assumed a structure that would make that development possible. This could not have happened however, if the ali'i were not already so enmeshed in the world market system that such action appeared to them to be in their own best interests.

Missing in the above discussion (as it frequently is in standard accounts) is any reference to the ocean. Yet the ocean traditionally was part of the land, and technically subject to the same joint ownership. The American goal with regard to the ocean was not to subdivide the fisheries into individual units owned in fee simple, but to change them into common property. The legal changes of the 1840s were
just as successful in changing ocean tenure patterns as those of the land, and the process will be discussed in detail later in the chapter.

While these major political and economic events occurred the Hawaiian population continued to disappear. Missionaries in 1823 attempted their first general estimates of Hawaiian population size, and in 1831-32 and 1835-36 they took a more formal census. In *The Missionary Census of Hawaii* Robert Schmitt discussed the difficulties encountered and the probable error in the latter two attempts, but the result was quite clear: a devastating population decline. This decline was verified by an official government census in 1850. The results are summarized in Table 2.

The decline was particularly dramatic on the island of Hawai'i, and some people were evidently moving to the vicinity of the urban areas on Maui and O'ahu. Any detailed analysis of the causes of this decline is beyond the scope of this research, but a few comments are relevant.

An unknown number of Hawaiians, particularly men, were absent from the islands aboard foreign ships and hence uncounted during any census. An additional unknown number had permanently settled in other countries and were lost to the culture. One contemporary estimate was given in 1846 by Keoni Ana, the Minister of Interior and reported in the August 8th issue of *The Polynesian*. The minister noted that over 650 Hawaiians had left in foreign ships the previous
Table 2. Population by Island 1823-1850

<table>
<thead>
<tr>
<th>Island</th>
<th>1823</th>
<th>1831-32</th>
<th>1835-36</th>
<th>1849</th>
<th>1850</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawai'i</td>
<td>85,000</td>
<td>45,792</td>
<td>39,364</td>
<td>27,204</td>
<td>25,864</td>
</tr>
<tr>
<td>Maui</td>
<td>20,000</td>
<td>35,062</td>
<td>24,199</td>
<td>18,671</td>
<td>21,047</td>
</tr>
<tr>
<td>Kaho'olawe</td>
<td>50</td>
<td>80</td>
<td>80</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Lana'i</td>
<td>2,500</td>
<td>1,600</td>
<td>1,200</td>
<td>528</td>
<td>604</td>
</tr>
<tr>
<td>Moloka'i</td>
<td>3,500</td>
<td>6,000</td>
<td>6,000</td>
<td>3,429</td>
<td>3,540</td>
</tr>
<tr>
<td>O'ahu</td>
<td>20,000</td>
<td>29,755</td>
<td>27,809</td>
<td>23,145</td>
<td>25,440</td>
</tr>
<tr>
<td>Kaua'i</td>
<td>10,000</td>
<td>10,977</td>
<td>8,934</td>
<td>6,941</td>
<td>6,956</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>142,050</strong></td>
<td><strong>130,313</strong></td>
<td><strong>108,579</strong></td>
<td><strong>80,641</strong></td>
<td><strong>84,165</strong></td>
</tr>
</tbody>
</table>

Source: Schmitt, *Demographic Statistics* (42)

year, and that "The number of those constantly sailing about the ocean cannot be much less than 3,000." He estimated that, together with Hawaiians more or less permanently on foreign land, the total absent was probably close to 15,000 ("Report").

The major factors involved however were a very low birth rate combined with a high death rate. Using missionary data from the 1834-1841 time period, Schmitt reported a birth rate of 19.3 per 1,000 inhabitants, "an exceptionally low rate for a nonindustrial society...." The death rate was approximately 47 per 1,000 inhabitants, a rate "high for any kind of society" (*Missionary Census* 13).
While introduced illness and sterility caused by venereal diseases were likely factors involved, the emphasis in the next section will be on a cause listed by David Malo in his 1839 analysis "On the Decrease of Population...." He noted that "in former times ... the chiefs took great care of their people."

But from Liholiho's time to the present, the chiefs seem to have left caring for the people. Their attention has been turned more to themselves and their own aggrandisement, and they do not seek the welfare of the people as a nation.... (126)

What Malo saw, criticized, and considered relevant to the population decline, was the increasing involvement of the ali'i in the market system. Since ali'i involvement was the key factor in the final destruction of the the social relations of maritime production, it will be examined in some detail.

ALI'I ADVENTURES IN CAPITALISM

By 1820 few merchant endeavors in the Pacific promised such large returns as trade in sandalwood, and Hawai'i was one of the few undecimated areas. Even in Hawai'i sandalwood was a resource fast disappearing, and traders were desperate to acquire the fragrant wood before it was gone. As a result Americans encouraged the ali'i to become even greater consumers of foreign goods than they had been before. The ali'i were eager to comply, and as a result
dismantled what remained of the traditional social relations of production.

Ships were the first item promoted by the traders. Two Boston firms, Bryant & Sturgis and Marshall & Wildes, competed heavily to import large ships for ali'i consumption. In 1820 Bryant & Sturgis sent out a 190 ton luxury brig, Cleopatra's Barge, which was purchased by Liholiho and Kalaimoku. The next year Jones, who in addition to being the American commercial agent was the island representative of Marshall & Wildes, complained to his employers that the vessel "is so superior to any of ours, that they will scarce look at them, had the sale of the Barge been managed right, she would have sold for 12000 piculs as quick as she did for 6000 ..." (qtd. in Morison, "Boston Traders" 36). Yet Tyerman and Bennet, who visited in 1822, thought the Barge would have brought one-tenth the price if sold in England (120).

Jones nonetheless was able to sell his ships quickly. In 1821, for instance, Jones wrote to his employer that he had sold Kaumualii the brig Becket, together with its cargo which included a complete frame house and the frame for a small schooner. Jones noted that when he first tried to sell to the Kaua'i king

[H]e replied that he had bought another Brig and wanted no more; I treated him with every attention and honour, made him handsome presents and gave him elegant dinners. [A]fter much trouble and difficulty I succeeded in selling the Brig and
Cargo including the house for 7700 piculs of wood payable in one year, the Boat [schooner] he has given me an obligation to pay when she will be furnished, per twice full [of sandalwood].

(qtd. in Morison, "Boston Traders" 32)

By 1822 visitors reported that Liholiho had ten ships of his own, as well as "considerable property in dollars and goods of various kinds ..." (Tyerman and Bennet 105). Foreign goods continued to pour into Honolulu, and by 1823 Stewart noted the presence of four American mercantile houses, the two from Boston plus one from New York and one from Bristol, Rhode Island. "Their storehouses are abundantly furnished with goods in demand by the islanders; and, at them, most articles contained in common retail shops and groceries; in America, may be purchased" (Journal 158).

What these goods were can in part be determined by Jones' letters to his employer. In 1823, noting that the time for "quick money" was past, Jones requested "ready made clothes and shirts, Calicoes of every description, Rum, wine and gin, handsome feathers, some good hats, and shoes ... ladies Bonnets and gowns" as well as a considerable quantity of ships stores and rigging, plus carts, wagons, tables and desks. Also requested were pumps and gear "as wells are now all the rage...." He noted that the king "is very anxious to have a billiard table, one that you might get for two hundred dollars would command at least $1500...." Carriages were also requested, since "Mr Pitt [Kalaimoku] asked me to send for three carriages and have them adorned with
As a final item Jones asked that, if possible, a steam boat be sent, as "the King and Pitt say they would give any price for one..." (qtd. in Morison, "Boston Traders" 45-47).

Missionary Levi Chamberlain noted the arrival of a carriage in 1824, which was purchased by Ka'ahumanu and drawn by ten men with ropes (3: 32). Soon Stewart reported that the king and the chiefs were now attending church on Sundays in a variety of wagons and carriages, "always drawn by twelve or fifteen natives; their horses not having yet been broken to the harness (Journal 168).

Horses were another import eagerly sought by the ali'i (and commoners as well, though few could afford them). Kotzebue, on his second visit in 1825, noted that many of the taro fields near Honolulu were now gone, and that "horse and foot races are proceeding all day long, and give occasion to extensive gambling" (New Voyage 219-220). He noted that it was the ambition of many to purchase a horse. The animals were brought in from California and sold for 200-500 piasters. In 1827 a local merchant recorded that upon the arrival of a cargo from California, "Horse fever raged high; every person who could muster sandelwood wanted to buy. Boki sent Gowan from Waimea to purchase the lot" ("Honolulu in Primitive Days" 80).

The desire for horses continued. In 1829 Stewart reported that on a visit to Boki's house in Nuuanu he was
accompanied by 50 chiefs and attendants on horseback, and reported that the king employed an English groom and kept "a stud of more than a hundred horses" (Visit 223). In 1831 the Danish botanist F. J. F. Meyen noted the "great number of horses on these islands" and that "already every reasonably well-to-do person, man or woman, keeps a riding horse" (47). Meyen also commented that this necessitated a vast increase in the cultivation of meadows.

Many and very extensive fields through which we have just wandered and which are presently being used as pasture land were formerly covered with sweet potatoes. Today one can still see the remaining traces of cultivation. They say that in the days of Kamehameha a great part of the Honolulu Valley was used for the cultivation of field-produce. Now there are meadows there and the valley is far less productive than in former times. (47)

Other imported items included houses, furniture, and all types of clothing. While in 1823 the king lived in a house of traditional materials, it was hardly of traditional size. The house was described by Stewart as "fifty feet long, thirty broad, eight feet high at the sides, and thirty at the peak of the roof" (Journal 100). The house had several windows with Venetian shutters but no glass, and two doors. Mats covered the floor, and there were also "three or four large chandeliers of cut glass suspended between the pillars...." Additional furniture included a "mahogany dining and pier tables; crimson Chinese sofas and chairs; several large pier glasses and mirrors ..." (101).
Frame houses, imported unassembled from New England, were also popular, as were other western style homes. Ka'ahumanu purchased one in 1824, and Kotzebue described it as "... a pretty little wooden house of two stories, built in European style, with handsome large windows, and a balcony very neatly painted (New Voyage 205). In the same year Kalaimoku built a two and a half story house of stone, described as sixty-four feet long and forty feet wide. Stewart noted that the expense of the house exclusive of the stone and presumably the labor, was "estimated at six thousand dollars" (Journal 311).

"European" clothing had always been of interest to the ali'i. A larger resident foreign population, including many from the middle class, helped stimulate this interest, and for women particularly the presence of the female missionaries brought a concern with fashion. Laura Judd, who arrived in 1828, noted the interest that Ka'ahumanu showed in the different dress styles exhibited by the new arrivals, who wore fuller skirts and sleeves than the "pioneer ladies" (5). Judd thought all the ali'i were well dressed, but nonetheless recorded Ka'ahumanu wanted someone to live with her and teach her the finer points of western fashion. The missionary women successfully encouraged "proper" dress, particularly among the church goers. In a "Joint Letter" published in the Missionary Herald in 1823 the missionaries noted that "Bonnets, hats, gowns, shoes,
stockings, &c., are becoming more fashionable in the higher classes."

In 1827 Beechey was impressed with the houses, dress, and furniture of the ali'i. He remarked specifically on the fact that most ali'i homes had tables and chairs, and that Ka'ahumanu had silk and velvet sofas and cushions (2: 97).

Not contented with the comforts of life, they latterly sought its luxuries, and even indulged in its extravagancies. Kahumana [Ka'ahumanu] filled chests with the most costly silks of China, and actually expended four thousand dollars upon the cargo of one vessel. Boki paid three thousand dollars for a service of plate as a present for the king, notwithstanding he had other services in his possession; one of which was of expensively cut glass from Pellatt and Green in London. (2: 97)

At least some ali'i acquired far more goods than they could ever display or consume. Frederick Bennett, who visited in 1834, remarked that "female chiefs" often bought out an entire color of a new material or ribbon, rather than have another chief wear the same (211). Kamakau recounted ali'i excess during Liholiho's reign, and noted that the chiefs "bought cloth, most of which was consumed by rot and worms, and the rest by fire" (Ruling Chiefs 251-52). Sereno Edwards Bishop, whose father Artemas Bishop arrived in 1823, recalled his boyhood experiences on the Kona coast:

Cloth of any kind was scarce. Kuakini [governor of Hawai'i] was disposed to monopolize such trade as came from occasional whalers touching at Kaawaloa. He possessed large quantities of foreign goods stored up in his warehouses, while his people went naked. I often heard my father tell of once seeing one of Kuakini's large double
canoes loaded deep with bales of broad cloths and Chinese silks and satins which had become damaged by long storage. They were carried out and dumped into the ocean. (26)

When Kuakini died in 1844, Laura Judd wrote in a letter to a departed missionary:

Old Governor Adam's [Kuakini's] things were brought down here from Kailua and sold at auction, instead of being thrown into the sea, as you have witnessed on similar occasions. It was a curious medley, such heaps of old military coats, broadcloth and flannels, mouldy and moth-eaten. Silk, crape, nankeen, bombazine, damask and velvets all dropping to pieces—material enough to clothe all the people of his village. (108)

To finance the purchase of western goods, ali'i engaged in a variety of enterprises. In most respects, internally Hawai'i had a tributary mode of production in the sense that Wolf used the term. Land, labor and all other resources were monopolized by the ali'i and not freely bought and sold in a market. Nonetheless, the motivation for ali'i actions was clearly to participate in the world market system. Ultimately in order to continue to participate they were forced to change the internal mode of production. The series of laws between 1845 and 1850, which enabled land and labor to be bought and sold were major steps in the internal transition to a capitalist mode of production.

Sandalwood was the primary source of income for ali'i during the 1820s. High profits were made at times by the American traders, but ali'i profits were also high in that
sandalwood cost them little to acquire. Most important, for much of the time only ali'i had access to this resource. In addition, the labor was "free" since ali'i not only did not need to pay wages for the labor but also because they no longer had any reciprocal obligations to their laborers. Ali'i did not usually provide the sandalwood gatherers with food or clothing nor pay them a wage.

Kamakau reported at one point that Boki provided his men with new axes and "warm flannels" prior to sending them to Wahiawa to cut sandalwood (Ruling Chiefs 293). However Kamakau was one of several observers who reported on the hardship of sandalwood collection for people required to spend long periods of time in the mountains with inadequate clothing and poor food. "Many of them suffered for food; because of the green herbs they were obliged to eat they were called 'Excreters-of-green herbs' (Hilalele), and many died and were buried there. The land was denuded of sandalwood by this means" (252).

Many foreign residents and visitors also commented on the hardships imposed upon the maka'āinana due to the sandalwood collection. Mathison gave a particularly detailed account of the collection at Waialua on O'ahu in 1822. Hundreds of people of all ages, both men and women were bringing sandalwood down for an ali'i, to be stored temporarily in a fifty foot long storehouse built for the purpose. The ali'i told Mathison that his personal worth
was now about $20-30,000 because of this trade with the Americans (409).

When the missionary William Ellis toured the island of Hawai`i in 1823, he visited Young at Kawaihae. Before daylight they were awakened

[B]y a vast multitudes of people passing through the district from Waimea with sandal wood, which had been cut in the adjacent mountains for Karaimoku [Kalaimoku], by the people of Waimea, and which the people of Kohala, as far as the north point, had been ordered to bring down to his storehouse on the beach, for the purpose of its being shipped to Oahu. (286)

Sandalwood collection often took months of labor in the mountains, and the missionaries believed food shortages for those left behind sometimes occurred. In the "Journal of the Mission" the missionaries reported that Chamberlain and some others had gone on a short trip to the Pearl River in the early 1820s. They took no food as they assumed they could buy provisions along the way.

[T]hey found the people very poor, and it was with much difficulty that they could obtain any food of the natives, and then only by paying three times its value. The reason why provisions are so scarce on this island is, that the people, for some months past, have been engaged in cutting sandal-wood, and have of course neglected the cultivation of the land. Vegetables are sold at a very dear rate. (Missionary Herald 19: 184)

Chamberlain noted in late December of 1826 that "everyone" on O'ahu had been called out by Boki to gather sandalwood and that by March of the following year most were still in the mountains (Journal 7: 35). Duhaut-Cilly
remarked on the scarcity of food in 1828, and blamed it on the sandalwood trade. "Now the ... cutting of sandalwood continues throughout the year and employs, for the profit of the grandees and masters, one quarter to one third of the population" (22).

In 1827, as the result of the visit by the U.S.S. Dolphin, the first head tax was imposed, whereby each person was required to collect half a picul of sandalwood, or pay four dollars per man and one dollar per woman instead. Individuals could then collect sandalwood for themselves, and British Consul Charlton noted that "this is the first time the common people have been allowed to sell it" (Correspondence 19). However the sandalwood collected by the tax was not all used to pay ali'i debts. Three months after the tax went into effect a Honolulu merchant noted the arrival of a British ship from Canton, and that "the King and Boki bought the cargo and are to pay sandalwood therefore immediately. The ship proceeds direct to Canton and will return as speedily as possible. I am afraid we shall never get any more pay for old debts" ("Honolulu" 79).

By the 1830s the sandalwood was almost entirely gone, and new sources of revenue had to be developed. The ali'i responded with a variety of approaches. Most were based upon the fact that Hawai'i had other resources which could be traded, both to visiting whalers and to other nations abroad. To engage in the trade the chiefs extended their
traditional powers of monopoly and their new powers of taxation. In addition, at least some ali'i attempted small-scale capitalist ventures.

The concept of a head tax proved a good source of revenue, and was permanently instituted in late 1833 (Chamberlain, Journal 20: 81). In 1836 Ruschenberger described the head or poll tax as one dollar for every man, a half dollar for every woman, and a quarter for every child four feet high (378). The poll tax, as much as possible, was to be paid in cash. Francis Bishop, who visited in 1834, noted that the people desired money rather than western goods, and cash was used primarily to pay taxes and rent (2: 19,27). Rev. John Emerson noted in 1836 that none of the commoners had money, and as a result "A full month is often spent by an individual in procuring two or three dollars to pay his annual tax" ("Letter from Mr. Emerson" 281). By 1840 William Richards reported that the poll tax was 75 cents for a man, about 38 cents for a woman, and lesser amounts for children over fourteen years (Sahlins and Barrere 26).

Rent or land tax could be paid in goods, including hogs, fishline and tapa, all of which the ali'i could sell. According to the Sandwich Island Gazette tapa was "used for sheathing vessels and covering the roofs of houses" (22 Oct. 1836). In 1842 Simpson noted that rope was still being manufactured for ship's rigging, and tapa for sheathing
ships. Five or six tapa sheets twelve foot square could be purchased for a dollar, and the king was the primary dealer (2:48). Hogs and any other food items could be consumed by the ali'i or sold as provisions.

The land tax was paid not only to the king, but also to the particular ali'i who owned the land. By the late 1830s some observers believed that close to 75 percent of whatever was produced went to either the king or the local landowner (Hinds 115; Correspondence 57). Richards reported that after 1840 the land tax was reduced, at least as far as the king's or government tax was concerned. The tax was now assessed in cash but continued to be paid in marketable goods (Sahlins and Barrere 26). These taxes at least in part were similar to the traditional obligations which commoners had to the chiefs, but the chiefs no longer had any obligations to the commoners.

Quantities of produce, to support the ali'i establishments as well as to sell to the whalers, continued to be generated through a more explicit labor tax. In 1827 Chamberlain noted that in the past people had to work one day a week for the king, but because of the king's debts the time had been increased to three days a week (Journal 11:10). Ruschenberger in 1836 stated that the figure was five days in every fourteen (378). By 1840 this was restricted to
three days of labor per month for the government, although additional labor was owed to the ali'i or konohiki landowner (Sahlins and Barrere 27).

Urban areas like Honolulu, and other harbors frequented by the whale ships, of necessity developed large markets. These markets were the primary source of provisions for the whaler, and were heavily taxed by the ali'i. In 1823 Ellis believed that two-thirds "of the proceeds of whatever the natives sell" was taken by the ali'i (299). Until 1839, the market tax averaged about half the proceeds (Ruschenberger 378; Sahlins and Barrere 25).

New occupations had emerged in the urban areas, but those Hawaiians who engaged in them were also taxed by the government. This tax became a new and not insignificant source of revenue. Richards noted that house builders, washerwomen, and anyone engaged in any kind of profitable business "paid a heavy annual tax for the privilege" (Sahlins and Barrere 25).

In rural areas relatively minor but marketable items were heavily taxed by the king. Polynesian arrowroot or pia proved to be one such commodity. Collected wild in the mountainous areas, pia could be sold to the traders who shipped it to foreign markets. On some islands, pia collecting was encouraged by the missionaries, since they could accept it from the Hawaiians in exchange for books and themselves exchange it to the traders. William Alexander,
missionary on Kaua'i, noted in 1836 that pia production had decreased because of "a heavy pia tax" recently imposed by the government (qtd.in M.C.Alexander 187). In 1840 Wilkes estimated that 200,000 pounds of arrowroot was shipped yearly to O'ahu. While the actual collector received two to three cents a pound, in goods, the pia was sold in Honolulu "at a profit of one hundred per cent. to the shipper" (4: 214).

The production of other items, such as salt, was completely monopolized by the ali'i. In 1821 Liholiho sent one of his own ships to Kamchatka loaded with salt. This was traded to the Russians for a cargo of fish, spars, and rigging ("Journal of the Missionaries at Woahoo" 274). Salt Lake in particular continued to be mined by the king, and many foreigners visited and described these activities. In 1835 Frederick Bennett saw over fifty men working in the lake, and mentioned that most of the salt was exported to the American northwest to cure skins and fish (400-401). Wilkes visited Salt Lake in 1840, and noted that salt from that source commanded a higher price than any manufactured on the other islands. Consequently it produced "a considerable annual income" for the king (4: 83). In 1842 the productivity of Salt Lake was still estimated at 30,000 barrels per year (Simpson 2: 47).

Ali'i also maintained a virtual monopoly on the production of cattle, which had become a highly profitable
item primarily because of the whale ships, although hides and tallow were also exported. Many of the wild herds were located around Waimea on Hawai'i, and in 1830 Kuakini took up residence there to direct the export of hides, tallow, and beef. So many cattle were taken that operations were suspended in 1840, apparently for fear the cattle might disappear (Wilkes 4: 218). Large cattle herds were found on other islands also, primarily owned by ali'i or foreigners. Meyen thought O'ahu had over 2000 cattle in 1831, with half of them owned by Marin (47). The cattle were not fenced in, nor were the fields, and major problems were experienced by farmers. As late as 1846 Missionary Richard Armstrong noted that it was difficult for farmers to fence their land as wood was so scarce, presumably because of the incessant demand by the whale ships and the urban areas for firewood. He concluded "The poor people on this island [O'ahu] have suffered and are now suffering great damage from the large herds of foreigners and chiefs" (Answers 41).

Ships owned by the ali'i were often leased to foreigners for trading ventures, although ali'i sometimes mounted their own expeditions. In one case a sealing voyage mounted by Kalaimoku returned with 6,000 skins and cleared a profit of $12,000 ("Extracts from the Journal at Honoruru" 275). But the more frequently mentioned business ventures of the ali'i involved raising cotton and sugar, the operation of small cotton mills, sugar mills and rum
distilleries, and the ownership of billiard rooms, taverns, and hotels.

Certain ali'i, particularly Boki on O'ahu and Kuakini on Hawai'i, were by far the most active. Chamberlain saw many cotton fields on O'ahu in 1826, planted by the ali'i on the advice of Lord Byron in 1825 (6: 22). Boki not only grew cotton, but took over the operation of a sugar plantation and mill in Manoa Valley. According to Chamberlain Boki paid his hundred or so workers two dollars a week (7: 2). Beechey in 1826 found Boki was particularly interested in the high price of sugar in California and considered that area a potential market (2: 113).

Boki also owned a billiard room, one of two in Honolulu in 1826 (Beechey 2: 97). By Stewart's visit in 1829, Boki's hotel, the Blonde, was in operation near the Honolulu docks (Visit 2: 115). Kamakau described a liquor store owned by Boki where "noisy swine" gathered. In addition Boki "established several stores in Honolulu where cloth was sold. 'Deep-in-debt' ... they were called because of his debts" (Ruling Chiefs 276). Boki apparently assumed responsibility for a large share of the government's debt, and when sandalwood was discovered in the New Hebrides in 1829, Boki organized a large but unsuccessful expedition to acquire the wood (Daws 56).

Kuakini was another chief who took advantage of the new opportunities in capitalism. According to Jarves Kuakini
bought and sold ships' cargos and at one point contracted to build a "church for the papists" (214). Kuakini also owned a sugar mill on the Wailuku River, which was actually operated by "two or three Chinese" (Wilkes 4: 208). In 1837 Kuakini started a cotton textile mill, which employed thirty women who were paid in cloth (Jarves 214). By mid 1840 the mill was no longer in operation (Olmsted 221).

The ali'i during this period were increasingly enmeshed in a world-system where endless consumption was not only possible but encouraged, and they operated within a culture which had made the transition to a tributary mode of production. They pushed this production system to its limits and beyond, and perhaps deserved the adjective almost every foreigner used to describe them: oppressive. After the sandalwood disappeared, many ali'i had financial difficulties and even government ships could no longer be maintained. In the end the ali'i may have had little option but to divide, lease, and sell the land, since it was the only untouched resource which remained to be sold.

Some of the older ali'i at least partially maintained the system of reciprocal obligation to their tenants and their personal entourage, as well as the tradition of chiefly largess. Ka'ahumanu was noted for frequent gifts of food to all foreigners, particularly gifts of fish (Gast 253). Mathison reported that chiefs were known to distribute goods to their people, and that Kalaimoku once
gave out three thousand blankets (451). Tyerman and Bennet recorded that the king and queens had distributed "great quantities of clothing" to their personal entourage (115). And Boki, who among his other activities kept a retail store, was recorded in 1827 as "distributing goods to his people from his store" ("Honolulu" 80).

The contradiction implicit in this last statement highlights the opposing value systems of the kinship and capitalist modes of production. The ali'i found it easy, from the base of traditional Hawaiian culture, to become very good consumers, but they continued to find it difficult to always be good capitalists. On the whole however, the traditional system of reciprocal obligation symbolically based on older and younger kinsmen relationships disappeared almost entirely.

As a result, the material and social distance between ali'i and maka'ainana widened. Hinds noted in the late 1830s that "civilization has produced less change among them [the commoners] than on their chiefs" (116). Maka'ainana clothing, houses, and material culture changed very little during this time period, except for those living in Honolulu and the few other urban areas. Hinds found the use of tapa "fast disappearing" but still common in the rural areas (130). He believed that housing had changed for the worse. The British consul reported to Hinds that before 1823 the "commonest man" had three separate houses, one for sleeping,
one for eating, and one for other activities. "Now he is content to live, sleep and [cook] his food in one poor hovel; this too is none of the cleanest, whilst formerly they were models of neatness, cleanliness and simple comfort" (123).

Most significantly, part of the material distance between the ali'i and the people now involved food itself, not only in terms of kind but of quantity. After 1820 the Hawaiian fisheries did not always provide an adequate supply of fish for the resident population. The changes in the maritime productive system decreased its productivity, and can be traced to the almost complete removal of ali'i involvement.

ENVIRONMENT, TECHNOLOGY AND KNOWLEDGE

Wilkes attended a school examination in 1840 and presented a poignant picture of class differences with regard to food. After the examination, the ali'i and their children sat at tables laden with "hams, turkeys, chickens, pies etc.," while "the common people's children took their poe and raw fish on the floor" (4: 53). The commoners and their children were also given a taste of molasses, which Wilkes was told was an incentive for parents to send their children to school.

Food differences between ali'i and makaʻainana were not new, but two things appear to have happened. While ali'i increased the variety of foods in their diet, that of the
maka'ainana decreased. More importantly, there was often a true shortage of fish in the commoners' diet, despite the fact that quantities of dried and salted fish were imported to the islands.

Shortages did not develop immediately, and the accounts from the early 1820s do not for the most part indicate any scarcity. Both ali'i and maka'ainana continued to include large quantities of fish in their diet. Robert Dampier, who accompanied Lord Byron in 1825, felt that food was in ample supply, and was particularly disgusted with the "corpulency" of the chiefs (49). After describing how much poi was consumed by ali'i, he provided a typically negative description of raw fish consumption.

They also at the same time provide themselves with a quantity of raw fish, to which is added a sort of seaweed by way of sauce, bearing the most rank, fishy, disagreeable smell imaginable. The heads of the fish, gills, liver &c., are set apart by themselves, & considered great delicacies. The first time I beheld this loathsome mixture, from its sanguinary hue, I mistook it for a bowl of red fruit thus mashed up. (50)

James Macrae, the botanist with Lord Byron's voyage, traveled around the islands with Manuia, one of Liholiho's companions on the trip to England who had returned on Lord Byron's ship. Macrae was as disgusted as Dampier when he saw commoners eating raw fish, complete with gills and entrails. Macrae told Manuia that

[H]e ought to have shown his country men how he had seen us eat our meals, [and] he replied, somewhat offended, that he and his countrymen liked
fish in that way best, adding that "He saw plenty of poor people in England, but we see none here; that they got plenty of poi, taro and fish and no want for anything like many a man at home. (44)"

Yet even in the early 1820s there are occasional references to the sparse diet of the commoners. Stewart, for instance noted: "The poverty of many of the people is such, that they seldom secure a taste of animal food, and live almost exclusively on taro and salt" (Journal 152). Duhaut-Cilly in 1828 believed that labor for the chiefs and missionaries, plus forced school attendance, left "little [time] ... for traditional practices." As a result, there was a "scarcity of food" (22). The naturalist on Duhaut-Cilly's ship, Paul-Emile Botta, noted that taro, potatoes and fish were the most common food eaten by commoners. Dogs, pigs, chickens and cattle were very expensive and "scarcely eaten except by the prosperous or the chiefs" (Knowlton 27).

Frederick Bennett, the surgeon on a British whaler, visited O'ahu in 1834 and 1835, and appeared to be a very meticulous observer of the eating habits of people in and around Honolulu. He found hogs and chickens quite scarce, and believed they were raised primarily to sell to the ships. Beef and to a lesser extent goat were the principle meats available, but were not eaten by the commoners. He identified several "wild herbs" which were collected for food, and noted that "crowds ... may be seen swimming and
diving outside the great reef at Honaruru, to obtain shell-fish, crabs, sea-weed, and other marine esculents, which they deposit in floating calabashes, and convey to the shore for their day's meal" (214). Nonetheless, Bennett believed that the commoners, at least on O'ahu, did not have enough fish in their diet.

There is no animal food which a Sandwich Islander esteems so much as fish; whether recent, salted, or even in a state of putrefaction,.... Many canoes are employed day and night in fishing off the shores of O'ahu, yet the supply of fish is not equal to the demand, and large quantities, (often including sharks and other coarse kinds,) dried or salted, are imported into Honoruru from the neighboring islands. (214-215)

Bennett believed that the introduction of more "animalistic" foods would be healthier, and that most disease occurred "among the people living in the primitive mode, in damp districts, and subsisting almost entirely on vegetables" (246). Ruschenberger, another physician who visited in 1836, essentially agreed with this analysis. He thought the diet was very poor, as "The food of these natives consists almost exclusively of taro, and when they occasionally get a little meat or fish, they esteem themselves fortunate" (373).

Alonzo Chapin, a doctor who arrived with the fifth missionary company in 1832, also noted that the people lived mostly on vegetables particularly taro, since "If we except a few fruits and a scanty and irregular supply of fish and other meats, they have little else to eat" (250). This was
true despite the fact that the market in Honolulu was usually well-stocked with fish, much of which Chapin thought was sold to foreigners.

Wilkes was another of the many visitors who believed that food was far from abundant. He noted that "... with the exception of chiefs, and those immediately connected with them, they often suffer as much as the poor of other countries. As civilization advanced this suffering seems to have increased, partly owing to the decrease of food..." (4: 219).

In 1846 the missionaries described the commoner diet as almost exclusively poi, potatoes, and fish. A Maui resident noted that on that island both poi and fish could not be obtained everywhere. On O'ahu Richard Armstrong described the diet as "poi, fish, meat, potatoes, bread, but mostly poi" (Answers 4).

Negative impressions such as this are certainly subjective, even though some (Wilkes and Botta for instance) were trying to make a "scientific" description of Hawaiian culture. Compared to visitors before 1820 however, the frequent references to general fish scarcity are striking. Even the more positive statements provided reveal information which could also be related to fish shortages.

Olmsted in 1841 noticed the preference among commoners for fish and poi, but also noticed the prevalence of dried fish. While Hawaiians had always eaten dried fish, fresh
fish was preferred, and the dependency on dried fish might indicate importation. Ruschenberger, though convinced from his own observations that the people often suffered from a shortage of fish, described a lower class "all-you-can-eat" restaurant in Honolulu, where patrons could dine on poi and raw fish for six and a quarter cents (326). This type of establishment was only one of many ways in which fishermen around O'ahu could dispose of their catch for cash, which could conflict with old patterns of reciprocal exchange. A reliance in some areas on imported fish and fish purchased at markets would create more of a reliance on dried fish, as well as a shortage of fish for individuals who could not easily participate in the market.

Another series of equally negative impressions on fishery productivity can be gained from sources written by Hawaiians. Much of the description of traditional fishing techniques which are preserved is accompanied by descriptions of large catches, with affirmations that such catches really occurred. Hence Kamakau, in his description of fishing for octopus with a cowrie lure, made it sound as though the he'e came into the canoe as fast as the fisherman could pull in the lure. "So it went, with the fisherman pulling up one octopus after another ... These were the days of many octopus" (Works 69). Kamakau described the catch from octopus spearing organized by the konohiki as enough to fill "forty or fifty canoes" and noted that everyone left
with fifty to a hundred animals. He added "The number of 
he'e caught today are only fifty percent ... of those caught 
in the old days" (Works 71). Kamakau was writing in the 
1860s and his work was originally published in a Hawaiian 
language newspaper. He obviously had no expectation that 
many of his readers would have any personal knowledge of 
such catches.

On the aku fish, Kamakau believed that

[A]ku diminished during the reign of Kamehameha II 
and the early years of Kamehameha III and has now 
disappeared from the places once well known to 
ka po'e kahiko [the people of old] and from the 
localities that were famous for the abundance of 
aku. They filled double canoes and boats in such 
numbers that most of them rotted. The aku and 
'ahi fishes disappeared during the time of 
Kamehameha III.... (Works 71)

While there might well be a tendency to exaggerate 
catches of the past and the effectiveness of traditional 
fishing techniques, Kamakau was not alone in his perception 
that catches were smaller and that fish shortages sometimes 
existed. As already noted, many outside observers had the 
same perception. It seems more likely that when Kamakau and 
other Hawaiians recorded tremendously large catches before 
1820, they spoke the truth. Less fish were available for 
people to eat, and in some cases less fish were available in 
the ocean, than in the past.

Kamakau recognized occasional large catches of fish in 
his own day, and he noted the years 1830-1831 as years of 
large catches in some areas. However, it was obviously so
unusual an event in "modern" times that he ascribed it to the "Lord." The kāhala fishing grounds were "so rich a man could catch as many as twenty to forty fish at one haul." Aku, 'ahi, and kawakawa were also recorded as plentiful, perhaps as "compensation for the difficulties into which the government was falling and the extinction of the old families of chiefs and commoners which occurred at this time" (Ruling Chiefs 301).

In discussing with approval some of the changes brought about by the new laws after 1839, Kamakau noted that "the restriction of certain seas for the chiefs to fish in worked no hardship in old days where there was so much fish it was often used for firewood" (Ruling Chiefs 372). The new laws were needed, in Kamakau's opinion, precisely because there were not enough fish, and any restriction on catching them worked a hardship on the people.

As Kamakau implied, the decline in productivity of the fisheries was a concern prior to the legal changes of the 1840s, and helped instigate those changes. Predictably, American advice was to raise productivity by "freeing" the fisheries so that access would be open to everyone. Keone Ana confirmed this in a report published in The Polynesian in 1847.

It was formerly believed that making the fisheries free, so that all could take advantage of them, would make them much more productive. But the expectations in that particular have not been
realized. The people were better supplied from their own fisheries than now,... ("Report of the Minister of the Interior" 6)

The concern over a decline in the productivity of the fisheries is of interest in view of the fact that large quantities of fish were annually imported to the islands. The major imports were salted salmon from the Pacific northwest and dried and salted tuna from the southern and western Pacific.

A taste for salmon had developed soon after the first Hawaiians went there with early fur traders. From then on salmon formed a small but constant import. In 1842 Simpson noted in a letter to London that salmon imported by Hudson's Bay Co. was selling for $10-$12 per barrel of 180 pounds. Because there would "always be a demand" for salmon and other northwest products such as timber he advised the company to continue to maintain a representative in Honolulu (qtd. in Williams 109,127).

Like any other import however, the market could be overstocked. George Pelly, the Hudson's Bay company representative, wrote to Simpson in 1842 that two American brigs had recently brought in 700 barrels of salmon. The company already had a large supply of salmon however, and the market was slow, so that Pelly believed the Americans would have to dispose of their stock at a very low price (Correspondence 163).
Salmon imports could be explained as the result of a very specific acquired taste and hence as somewhat of a luxury item, even though they did add to the total quantity of fish available. Yet probably the major fish imported to the islands during these years were dried and salted 'ahi and aku, fish which presumably could have been caught in Hawaiian waters.

While whalers used cash to purchase provisions and other supplies when necessary, as much as possible they used fish. Francis Bishop's whaler visited Hawai'i at least once a year from 1832-1834 while whaling on the Japan grounds. Most of the time on the way to the islands was spent catching "albacore" ('ahi). "These were cleaned, split open, immersed in brine pickled and dried. The Sandwich Islanders are very partial to them and exchange their vegetables and fruits for the same" (2: 7-8). At Lahaina in 1832 Bishop's ship initially took in four 40 gallon casks of salted fish, "which were soon disposed of for vegetables, pumpkins and other fruits" (2: 19).

Frederick Bennett's whaler also used fish to trade for supplies when it visited in 1834 and 1835. On their return visit to Hawai'i in 1835, Bennett noted that "albacore had constantly attended the ship in incredible numbers, and our crew, in anticipation of a traffic with the Sandwich Islanders, had preserved a large quantity of them in casks of brine" (395).
Olmsted reported that on whalers generally fishing was a favorite pastime:

Vast schools of fish frequently accompany ships for several days in succession, and whalers are often surrounded for month after month by countless hosts of the finny tribe ... it is not uncommon for whalers to salt down several barrels of these fish for their own use, and to barter them away with the natives of the Pacific Islands ... There are several varieties of fish that accompany ships, the most common of which, are the "albacore" and the "bonetta" [aku], or "skip jack", as he is called by the sailors. (146)

These two fish were caught by Olmsted's ship on its way to Hawai'i in early 1841, and were used to purchase provisions in Honolulu. Salted and dried fish were obviously easy for the whalers to obtain, and the only costs involved were those of the salt and the casks. Such a cheap way to purchase necessary provisions was probably used by many whalers, and over a hundred were calling per year through 1843. After that the numbers jumped dramatically to over four hundred a year. The fact that whalers could find a ready market for 'ahi and aku indicates that major changes in the maritime production system had occurred.

There are several possible causes for the decline in fish productivity and the apparent scarcity of fish. These include environmental depletion, the loss of knowledge and techniques, the number of men diverted to wage and agricultural labor, the decrease of ali'i supported benthic and pelagic fishing, and the interference that a growing market economy caused in traditional reciprocal and
redistributive exchange systems. These factors will be examined in the remainder of the chapter.

Environmental Depletion

There are several indications that part of the scarcity was due to environmental depletion, at least of the inshore zone. This was particularly true of the island of O'ahu with its developing urban center of Honolulu. As noted in the previous chapter, as ali'i resided more permanently in or near Honolulu, the annual opening of the fishing grounds off Kalihi became a significant event with large quantities of fish taken. Stephan Reynolds described the disappointing opening of the fishing season in July of 1824:

At 4 [PM] started for a fishing frolic, got down to the grounds at dusk. Most of the residents were out, some for fish, some for fun. The ground where the fish are taken is not allowed to be fished on for several months previous; then the chiefs go with a string of nets which prevent them getting out and every one has the fish he can take with his hands. All the natives have a chance to fish. At day light all was bustle in getting ready to get on the grounds for fishing. But great disappointment was felt when it was found there were no fish. Many went away getting nothing; some who staid [sic] til ten or eleven o'clock got a small quantity. ("Journal" 155)

Kamakau recorded other evidence of depletion. He noted that during the last years of Ka'ahumanu's life (early 1830s) she did not impose any tabus on O'ahu fishing, apparently because of a shortage of fish. Ka'ahumanu "allowed the people to fish in the tabu waters of Oahu and forbade the landlords to prevent them from taking fish
usually restricted for the chiefs, such as the uhu [parrot fish], opule [wrasse], he'e [octopus] and kahala [amberjack]. For a time there were no tabu fishing grounds for Oahu" (Ruling Chiefs 307-8). Except for the kāhala, a benthic fish, the other fish specifically referred to are inshore species. If the shortage of fish was caused by overfishing of the inshore zone, unrestricted fishing presumably exacerbated the problem.

There is no reason to think that people spent less time at inshore fishing after 1820. Most of the fishing actually described during this period is inshore fishing: the reference already cited from Frederick Bennett regarding the "crowds" of people constantly fishing outside the reef in front of Honolulu is one such example (214). Large numbers of women and children, as well as men without the highly specialized knowledge required by benthic and pelagic fishing, had always fished the inshore fisheries. They continued to do so even at a much later time in Hawaiian history. After annexation in 1901 John Cobb was sent by the U.S. Fish Commission to study the fisheries. He found that native Hawaiian fisherman were the largest group of fishermen. The reason was that most women and children engaged in "the hand fishery," and most men fished "spasmodically" in the inshore zone even if they were farmers or laborers (Bulletin 718). This almost certainly represents a continuation of the traditional pattern, and there is every
reason to think that Hawaiians engaged in this pattern between 1820 and 1850.

The inshore zone had always been the most productive zone, as well as the zone that could be exploited by everyone, without specialized knowledge or equipment. If benthic and pelagic zones were underexploited due to a decrease in knowledge and a change in the social relations of production, overfishing of the inshore zone was a very likely occurrence.

In addition to overfishing, the inshore zone was negatively effected by other events. Deforestation was one such event. Both the ships and the urban areas needed wood, and in addition there was the increased demand for animal pasturage. This increased the silt runoff into the ocean and had a negative effect on the inshore environment, although it is impossible to quantify that effect.

One species severely depleted during this time period was the oyster in Pearl Harbor. Cobb noted that the oyster beds had ceased to exist before 1850, and that this brought an end to the pearl shell industry. He thought this was caused by overfishing by the ali'i (Report 498). Sereno Bishop however, who had eaten the oysters in the 1830s, thought they had become extinct due to mud washed into the harbor from upland occupation by cattle (46). Quite probably both were factors. For a marine population already
under stress from overfishing, minor environmental changes could be significant.

The silting up of Honolulu Harbor and damage to the adjacent reefs also was first perceived as a problem during this time period. Wilkes found that the king in 1840 was very concerned that the depth of the water in the harbor was decreasing. The king wondered if this was due to the quarrying of coral for use as building material. Wilkes investigated and found that "much mud is silting the harbour", which came from the stream out of Nu'uanu valley as well as the "wash from the town." He recommended building a wall on the reef (3: 392). Two years later Simpson also noted that the harbor was becoming shallower because of mud washing in, and recommended dredging (233).

After 1820 coral was increasingly used as a building material for houses, stores and other buildings, particularly in Honolulu. By 1840 much of the coral quarrying took place in what had formerly been very productive reef areas to the west of Honolulu. Wilkes noted that the ali'i "have much ambition to own an European house, which are built of coral blocks, taken from the reefs to the westward of the town: of this there appears to be an inexhaustible supply." Wilkes was also told that "a foreigner had obtained a lease of this profitable source of revenue from the government" (3: 392). In 1846 the editor of The Polynesian described the scene in Honolulu: "Stores
and warehouses are rising phoenix like in our midst ... Most of the buildings now in the course of erection are built of coral ... The amount invested in building the past year cannot be less than $40,000" ("Editorial" 34). Hence a productive inshore habitat was slowly destroyed.

Knowledge and Techniques

It is probable that the body of knowledge related to fish decreased dramatically during this time period. Continued depopulation was one factor, for as the death rate increased it became more difficult for highly skilled fisherman to pass on all of their knowledge before their death. Since much of that knowledge involved the benthic and pelagic zones, this factor by itself would lead to a decrease in exploitation of those zones.

The failure of the ali'i to support skilled fishermen was another factor that lead to a decline in related knowledge. After the legal changes in social structure during the 1840s, there was basically no support by any ali'i. Such support was particularly vital for benthic and pelagic zones, and without such support there was less motivation for young men to become skilled fishermen, and less chance for older headfishermen to pass on their information.

Of great importance may have been the increased "competition" which existed as far as knowledge was concerned. Children who attended years of American-style
schooling had less time to learn traditional skills and knowledge from their parents and less motivation to do so. Other skilled labor opportunities were now available, particularly for those who lived on O'ahu or near other major harbor areas. Some of these opportunities, such as work on the whalers, took young men away for years during the time of their lives when much traditional learning should have been taking place.

Kamakau noted these problems. He described the care that Kamehameha I had taken of traditional craftsmen, including the fishermen, and complained that "when [western] learning began to spread all these skilled people ... were lost sight of" (Ruling Chiefs 375). According to Kamakau this became a more serious problem after the first Constitution (1840). Prior to that a chief would "adopt" the skilled craftsmen and provide them with land, food, tapa, and fishnets, but after that the craftsmen received only "a quarrel over property, a blow at the chin and at the head" (Ruling Chiefs 408).

Kamakau believed that the aku and 'ahi disappeared during the time of Kamehameha III from many of the areas where they had previously been taken (Works 71). It is more likely that there were fewer men fishing for pelagic fish, and perhaps fishing less effectively. This caused a decrease in supply. Kahaulelio, who had personally fished for aku in the 1840s, did not indicate an actual shortage of
fish in the ocean, but did indicate that prior to 1820 more fishermen pursued *aku* fishing: "In the olden days, before the coming of the missionaries to Hawaii Nei, the people fished often for *aku*, both with the *pa* hook [pearl shell lure] and the *malau* [live bait box]" (9).

While both techniques continued to be used after 1820, at some point Kahaulelio's father gave up *aku* fishing with lures since he was unable to obtain the pearl shell. Kahaulelio only participated with his father in the type of *aku* fishing which used live bait kept in a *malau*. However, in 1848 "my father deserted *aku* fishing with the *malau*, because it involved too much work in taking the *malau* filled with iao fish bait from five to seven miles out, rowing a double canoe all the while" (9). The "too much work" may have been true if too few people participated in the work. In any case, fewer and fewer fishermen appear to have continued these types of pelagic fishing.

Benthic fishing, with its requirement of highly specialized knowledge of different grounds, also decreased during this time period. It was not abandoned, but fewer people fished successfully because the locations of many grounds were lost. As noted in chapter 3 knowledge of deep sea fishing grounds was often kept a secret, and such secret knowledge would be lost more easily under the conditions described after 1820. According to Kamakau, "The locations of most of the deep-sea *ko'a* have been lost; only a few
remain known, as the knowledge of their whereabouts has lessened, and the youth of today have not been taught their locations" (Works 76).

The conclusion seems clear. Between 1820 and 1830, fewer and fewer men were learning the complicated skills and information necessary for certain types of fishing. There is no reason to think that Kamakau is exaggerating when he wrote in the 1860s that "The expert fishermen are most of them dead, and their art is becoming lost to this generation" (Ruling Chiefs 239). It was precisely for this reason that so many Hawaiians, even before 1850, began to write down descriptions of their traditional culture, including the knowledge associated with fishing. The result of this decline in knowledge was a decrease in fish supplied from pelagic and benthic zones.

There were no major changes or introductions to the actual technology of fishing during this time period, although most of the trends noted before 1820 continued. The manufacture of pearl fishhooks and in particular of the traditional pearl aku lure decreased even further, although it was not abandoned. Because so many more ships were visiting the islands, such items now had an increased commercial value as "curiosities."

By 1822 Mathison found that the "native arts and manufacturers are sinking fast into neglect and disrepute..." (476). He visited Kalaimoku and found the chief examining
his hooks and lines and other apparatus. Mathison noted that the chief had many pearl hooks, but refused "to part with any for less than a dollar each" (423).

Dampier, one of Lord Byron's party in 1825, noted that everyone on the ship was interested in purchasing "curiosities," and that the price demanded was "invariably ... a dollar" (47). Lord Byron noted the support of craftsmen given by the chiefs in the past, and what he termed the chiefs recent "change of occupation...." As a result Byron considered it probable that "the ornamented pahoe, the pearl fish-hook, and the splendid war-cloak, will soon be more easily found in the cabinets of Europe than among the islands of the Pacific" (192). He did note however, that many items including the "mother-of-pearl fishhooks" were being made especially for the market (137). The market was apparently not large enough to sustain the craftsmen, for by 1846 when the Dane Steen Bille tried to buy "antiquities" for the Danish national museum, he found them both very rare and very expensive (135-6).

Metal hooks almost totally replaced hooks manufactured out of indigenous materials, even pearl. The Hawaiians continued to prefer the traditional incurved form in metal. Traveling on the island of Hawai'i in 1823, Ellis reported that nails were highly prized, and that the fishermen "would rather receive a wrought nail, to make of it a fish-hook according to their own taste, than the best
English-made hook we could give them" (85). In 1826 Botta remarked on the prevalence of "European hooks", but also described the akan lure, manufactured with a metal hook and "bits of polished mother-of-pearl with bristles at one end" (Knowlton 28). Sereno Bishop noted in the 1830s that the

[A]ncient bone hooks had disappeared. Steel fish hooks were a leading article of trade. The fishermen very commonly preferred a peculiar form of hook which they filed out themselves from long needles; it was without barb, the point being bent to one side and curving inward. (28)

Octopus lures continued to be manufactured in the traditional style, except for the metal hook. While hiking in Manoa valley in 1831, Meyen came across an outcrop of basalt conglomerate. "The Indians were just then busy chipping flat pieces from this rock which they wanted to use to hunt octopus" (46). The choice of stone, as noted in chapter 3, was important to the lure, and obviously some fishermen remembered and did not immediately substitute lead. This was one specialized used of certain stones which Kamakau recorded as "forgotten" by the 1860s (Works 68).

Canoes continued to be built, at least on the island of Hawai‘i, but most were relatively small single canoes. The large double canoes became rare, and less used for fishing as the ali‘i support of fishermen disappeared. Although single canoes could easily be lashed together and their outriggers removed, the decrease in large canoes available
to fishermen may well have been a factor in the diminished benthic and pelagic fishing.

Byron in 1825 noted that Hilo "formerly" excelled in the manufacture of double "war" canoes, but that they had become rare and were "chiefly used on occasions of state" (192). Botta saw no double canoes in use on O'ahu in 1826, and the largest single canoe he saw was about thirty feet long. He noted that the canoes were not built on O'ahu but imported from the island of Hawai'i (Knowlton 29). That island continued to be the main source of canoes, which remained the basic transportation of the fishermen throughout this time period. However, like most of the fishing gear, it was increasingly necessary to purchase them in a market.

Like technology, the methods of fishing did not undergo radical change, in that no new techniques were introduced and probably none were totally abandoned. However, it is almost certain that techniques associated with benthic and pelagic fishing decreased, for reasons already noted. It is also possible that some methods of inshore fishing which required little skill, in particular the use of fish poison, increased.

Actual descriptions of fishing, from either residents or visitors, are as rare in this time period as they were for the earlier one. Net fishing of various types was reported, as was spearing and the use of hook and line. The
most frequently mentioned technique however was the use of fish poison. Tyerman and Bennet described it in 1822 (118), and Chamberlain saw it in use at Lahaina in 1825 (4: 49). Bingham, traveling around Kaua'i by canoe in 1821, described the following scene.

Near ... [a] settlement, a party of natives--men, women and children, were engaged in fishing in a singular manner still in vogue. Diving down, they place among the stones a native plant--the auhuhu, called a poison, which appears to intoxicate the fish. The natives then dive or swim after them, and take them in their hands, or sitting in canoes, or standing near the shore, take them easily in scoop nets. (144)

Other references to fish poisoning could be cited, and Meyen noted that the plant, Tephrosia was common in the drier areas of Nuuanu valley (21). The many references to fish poisoning are not necessarily evidence that this technique had actually become more common, since obviously foreigners viewed the method as "exotic" and hence worthy of mention. On the other hand, it was an inshore technique, required little knowledge or skill, and yielded a sure supply of fish. If inshore fish were sometimes scarce, the use of 'auhuhu could easily become the preferred method of fishing.

It is possible of course, that other specific techniques associated with specific inshore fish grew scarce or disappeared. One example cited by Kahaulelio is that of the ma'oma'o or mamo, the green damsel fish. Kahaulelio stated that these fish lived on specific grounds between 60
and 180 feet, and were usually caught with a net set by divers. He noted that since at least 1850 none of these fish were ever available for sale, and that their grounds and the methods of fishing had been forgotten (77). Although these fish are found in shallower depths too, it is possible that fewer men capable of diving over 60 feet were available to set nets in the traditional manner.

Overall the situation is one of gradual loss of knowledge, and a decrease in methods which required either specialized knowledge or technology. The reduction of the quantity of fish coming from the benthic and pelagic zones, as well as some depletion of the inshore environment due to excessive fishing and other factors, caused a frequent scarcity of fish. An examination of the changes in the social relations of production supports this conclusion.

SOCIAL RELATIONS OF PRODUCTION BEFORE THE CONSTITUTION

With the abolition of the formal religion and its associated tabu system in 1819, many of the religious practices which had functioned to limit access to (and hence conserve) the maritime resources of Hawai'i disappeared, as described in chapter four. Even after the abolition of the formal religion however, ahupua'a chiefs and konohiki retained the right to restrict fishing on the fisheries attached to their lands, and the king had the right to restrict any fishing anywhere.
The actual method of imposing a tabu on a fishery remained the same. Alexander Bloxam, naturalist aboard the Blonde in 1825, observed "several sticks set up with a piece of tapa attached close up on the shore. These we found out were placed there to indicate to the natives that the fishing ground opposite was tabooed, and preserved for the use of one of the chiefs" (77).

Mathison in 1822 was of the opinion that the king used his authority to tabu the ocean for the same purpose as he tabued resources on land: to monopolize trade. While Mathison's whaler was in Honolulu the king tabooed potatoes in order to provide a supply to provision several foreign vessels who were in port. Mathison also noted that

The King exercises absolute dominion over the sea as well as over the land; and in the same way lets out the right of fishery along the coast to his chiefs. He can, whenever he pleases, taboo the sea, that is, interdict every person from fishing for a certain time; and at those times no one even thinks of opposing his order. He takes care to turn this privilege of tabooring to good account, upon suitable occasions. (452)

While fish were not commonly used to provision the whalers (who as earlier noted could fish for themselves and often imported fish into the islands), fish continued to be supplied to naval ships in the 1820s. Naval ships were usually supplied free of charge, although the ali'i could expect elegant presents in return. Kotzebue and his shipmates were "overwhelmed ... with presents of fat hogs and the finest fish, [the chief] putting all the fishermen
into requisition to provide abundantly for our table" (2: 223). Ka'ahumanu, sailing aboard the Blonde from Honolulu to Hilo, "requisitioned" fish along the way by taking all the fresh fish directly off the fishing canoes, and she also ordered villages to send out both salted and fresh fish (Bloxam 50).

The king continued the practice, mentioned from the earlier time period, of tabuing the fisheries of Honolulu and the area immediately to the west of the city for prolonged periods. Although as noted all tabus on the O'ahu fisheries were suspended during the last years of Ka'ahumanu's life, they were reinstated by the king after her death. On the day when the tabu was lifted everyone in the Honolulu area went fishing. Chamberlain noted in his Journal in late July 1835 that the school examination at Waikiki had to be postponed a week so that the people

[M]ay avail themselves of the privilege of taking fish in the waters between this place and Ewa. The common people I have been informed are allowed by custom to assemble at certain times to take fish freely--This is a privilege of which all wish to avail themselves; I do not know of how long a standing the custom is, but certainly from Kamehameha's time as I learn that he used to go with the others on such occasions to fish. (19: 24)

Chamberlain does not record what the catch was that year. Hopefully it was not as dismal as that recorded by Stephen Reynolds in 1823.

There were additional tabus which originated during this time period. The American missionaries in Hawai'i
worked hard to tabu any kind of labor, including fishing, on Sundays. Chamberlain recorded several instances where missionaries preached this tabu from the pulpit, or actively sought to stop any "work" they happened to see. In 1825 Chamberlain toured the island of Hawai'i, accompanied by a chief who passed on Ka'ahumanu's orders which prohibited Sunday fishing. On that tour Chamberlain reported that the taro and potatoes were "scorched" by drought (Journal 4: 34), and traditionally this might have been a time when tabus were relaxed. Regardless, in areas where missionary influence was strong, or where the ali'i had converted, this new tabu appeared to have been stringently observed.

Another tabu, while not exactly a new one, was now more frequently applied, and in ways which had nothing to do with traditional fishing cycles. Men could not fish on days they were assigned to labor for the king or other ali'i landlords. Theodore-Adolphe Barrot, a Frenchman who visited in 1836, specifically noted that canoe travel was tabu on labor days, although he did not believe that this posed any hardship on the people (77). During the 1820s and 1830s the total number of labor days required probably increased, as was noted earlier in this chapter. Sandalwood collection took large numbers of men into the mountains for months in the 1820s, and ali'i used some of the crop production from their own lands to sell to the ships as well as for personal
consumption. Additional labor requirements, particularly building churches, took large numbers of men in some areas.

It was not just that ali'i required more of the commoners time in labor. Unlike the traditional system, or even the pre-1820 labor demands, the new labor requirements were not integrated into ecologically determined fishing cycles. As noted in chapter three, much fish behavior is regulated by lunar cycles, a fact clearly recognized in traditional Hawaiian fishing practices. In addition, weather conditions prevalent at certain times of the year prevent the exploitation of particular ocean zones. Traditionally the labor requirements of the ali'i were integrated with the maritime requirements both monthly and annually. Now however, the need to provision whalers during their biannual appearance at Honolulu and Lahaina created a different cycle. Sandalwood collection depended on the interest of ali'i in acquiring western goods, and frequently followed the arrival of a ship traders wanted to sell. The arrival of American naval vessels also stimulated months of labor by the commoners to pay the sandalwood tax. Church construction and other labor requirements by ali'i (such as for their own homes) followed no ecologically related pattern. Per capita fish production could not help but decrease under such a situation.

By the 1830s there is little evidence that the important ali'i spent much time fishing themselves, or that
they continued to organize labor for traditional fishing techniques. This was particularly true of benthic and pelagic fishing, which in addition to labor had required ali'i participation to furnish canoes, large nets, and specialized fishing equipment. Prior to 1820 there are constant references to be found of Kamehameha and other important ali'i involved in fishing or directing fishing operations. After 1820 there are practically none.

The government continued to accept large fishing nets as payment for taxes even into the 1840s, but it is questionable how frequently they were used for the type of fishing that Beckley termed "Lau Kapalili" or the "Fishing of Kings". In her description of this fishing, which took place one or two miles from shore and required 60-100 canoes, long nets, and many people, only the kings could command such resources. She noted that Kamehameha V "frequently ordered the Lau Kapalili" (19-20). It is probable that this is another of several traditional practices that Kamehameha V attempted to "revive" during the 1860s, and that it had not actually been practiced since his own boyhood in the 1830s.

Land with attached fisheries continued to be given or leased to men who were not expected to behave like traditional chiefs. In a letter published in 1826 in The Missionary Herald William Richards described a large tract
of land given by Boki to the Tahitian teacher, Stephen Pupubi:

It contains several artificial fish ponds well stored with fish; affords a great quantity of woke (tapioca shrub) and has as good timber for canoes, and for building, as any on the island of Maui. He can also claim half of all the fish that are caught, on that part of the sea in front of his land.

Richards went on to describe ali'i assumptions about the fisheries, and the current percentage of its products which were owed to the landowner.

The right, by which a man may claim fish caught by others in the sea, may, indeed, be questioned by those enlightened in the principles of jurisprudence; but the chiefs of the Sandwich Islands make no question on the subject. They lay an equal claim to the sea and land, as their property. The sea is divided into different portions, and those who own a tract of land on the sea shore, own also the sea that fronts it. The common rule observed by the chiefs is, to give about one-half of the fish to the fishermen, and take the other half to themselves. Should Stephan observe this rule, he will have much more than a supply of fish for himself and family, and he will be able to sell a sufficient quantity of produce from his land, to procure all the foreign comforts that he will need. ("Letter from William Richards" 175)

The konohiki or landlord could regularly claim half the catch, with no reciprocal obligation to the fishermen to provide canoes, nets, gear, or plant foods. Nor could there be any expectation that such landlords would use their power of tabu to conserve the fisheries, although undoubtedly many did. Others however probably used their fishery as Richards proposed Pupubi use his: for personal profit. Under such
conditions it is clear why the Honolulu market was usually well-stocked with fish, yet some people did not have an adequate supply.

The fishponds, particularly the types traditionally built and maintained by the ali'i, also began to disappear or to be used commercially. It is also from this time period that the majority of references to fishponds as the exclusive property of particular chiefs are found.

According to Ellis' description the numerous ponds around Hilo in 1823 "literally swarm[ed] with fish." The fish however belonged "to the king and chiefs, and are tabued from the common people" (240). In fact Ellis reported that as far as the commoners were concerned there were "hardly any fish" available to eat in the Hilo district (252).

Dampier visited the Hilo ponds and reported that they belonged to Ka'ahumanu, who owned extensive lands in the vicinity. He noted that

All these lakes are most plenteously stocked with very fine fish, resembling mullet, which, taken from the neighboring streams, are fed & fattened here, & flourish so abundantly, that a native assured me ... that he once tumbled into one of these ponds, and was literally buoyed up by the immense quantity of fish immediately beneath him. Still no Kanaka is allowed to touch them, indeed before our arrival the two missionaries who are stationed here could scarcely ever procure any. (53-54)

Although according to the Sandwich Island Gazette at least one of the fishponds in Hilo Bay was destroyed by a
tidal wave in 1837 (Nov. 25), Wilkes found several others were still kept up but rarely used in 1840. Wilkes reported that the ponds, which covered many acres, were under the charge of a king's agent. Few of the fish were caught as they were reserved for the king or agent and "from this cause, the fish have multiplied to a great number, and are in very fine order for the table" (4: 208).

Lahaina was another area noted for its fishponds, and taro fields which also grew fish. Macrae visited in 1825, and noted as had previous visitors that it was difficult to get around because of the many taro ponds. He noted that the ponds were about four feet deep from surface level and usually contained over two feet of water. "The water is constantly supplied from a neighboring stream by means of a small canal emptying itself from a neighboring stream by means of a small canal emptying itself from one pond to another, until at last it reaches the seashore. These ponds are used for keeping fish and ducks as well as for growing taro" (8-9).

Bloxam, Macrae's shipmate, also described Lahaina and estimated the population at about five thousand.

The line of houses extends far alongside but not much in depth. At the back of these are several shallow fish ponds formed by the natives, and which are well stocked with fish purposely and solely for the chiefs. Beyond these for a space of three-quarters of a mile towards the hills, the ground consists of gardens well cultivated and divided from each other by low stone walls.
Water- and musk-melons, the taro root, sweet potato, sugar cane, cabbages, tobacco plant with the coconut and breadfruit trees are in great abundance. Goats, pigs, ducks and chickens are also plentiful. (26)

An 1846 visitor to Lahaina presented a striking contrast to that picture. Writing in *The Polynesian*, he noted that though there was plenty of water in the vicinity there was little cultivation, and dust was a problem. He recommended that the government should "give away land in this vicinity to every one who would undertake to make vegetation grow where now nothing but the most choking and penetrating of dust heaps exist". In the next issue the same correspondent also reported on the numerous and unhealthy "marshes" around Lahaina, apparently the remains of some of the fishponds ("Maui Correspondent" 34,37).

The numerous fishponds and taro ponds at Waikiki were also frequently described, and as were the fishponds at Honolulu. The missionaries reported in *The Missionary Herald* in 1821 that one of the large Waikiki ponds was held by an American black named Allen. Besides the pond, which afforded "frequent supplies", Allen raised squash and kept 300 goats, all of which he sold as provisions to the missionaries and others, and used to provide meals for "boarders" ("Journal of the Mission" 141).

In 1826 Kalaimoku gave the missionaries one of the fishponds in Waikiki, and Chamberlain visited it to take possession and to commit the pond to the care of an old man
living in the neighborhood (*Journal* 6: 11). These were not
the first fishponds given to the missionaries, as the Kaua'i
mission received two ponds providing "excellent fresh fish"
in 1821 ("Letter from Whitney and Ruggles" 216-17).
Foreigners did not necessarily make good caretakers of the
ponds however, and they certainly did not make attempts to
redistribute the fish as the ali`i sometimes still did.

In 1825 Bloxam walked from Honolulu into Waikiki in search
of shells to collect. He noted that

The whole distance to the village of Whyteete is
taken up with innumerable artificial fishponds
extending a mile inland from the shore, in these
the fish taken by nets ... seem to thrive and
fatten. Most of these fish belong to the chiefs,
and are caught as wanted. The ponds are several
hundred in number and are the resort of wild ducks
and other water fowl. I found it very difficult
to get out of the labyrinth of paths which lead
among them. (35-36)

The Waikiki ponds fell quickly into disuse and in fact
much of Waikiki was abandoned. In 1828 Chamberlain walked
from Honolulu through the Waikiki area on an island tour to
examine the schools.

Our path led us along the borders of extensive
plots of marshy ground, having raised banks on
one or more sides, and which were once filled
with water, and replenished abundantly with
esculent fish; but now overgrown with tall rushes
waving in the wind. The land all around for
several miles has the appearance of having been
once under cultivation. ("Tour" 26)

The *Polynesian* by 1846 complained that Waikiki was an
"abominable slough" ("Maui Correspondent" 37). Frederick
Walpole described Waikiki in the late 1840s as a land of
"enormous marshes", with plenty of wild ducks for the sportsmen to shoot (2: 257). The abandonment of what had once been a productive agricultural and aquacultural area was in part due to the decrease in population, but it was also due to the abandonment of the area by ali'i, many of whom now lived around Honolulu.

The fishponds at Honolulu were maintained throughout most of this period. Lord Byron believed that the ponds were used to "secure a constant supply of fish" (120). Wilkes recorded "a number of fish-ponds belonging to the king" in the vicinity of Honolulu, as well as other small ponds belonging to individuals (4: 85). The largest pond, located at the mouth of Nuuanu stream, was condemned to destruction in 1847 by a committee investigating the continued deposition of mud into Honolulu Harbor (Greer 67).

Various other fishponds were described during this time period. On Kaua'i Wilkes described the extensive fishponds belonging to Deborah Kapule at Wailua, and noted that "while our gentlemen were there, Deborah received young fish in payment of the poll-tax, which were immediately transferred to her ponds" (4: 68). A year earlier the Kaua'i governor had built a large house of traditional materials. Over a hundred feet long and thirty feet high, several fishponds and taro patches were filled in to build the house (Jarves 128-29).
At least one fishpond disappeared during this time period due to environmental degradation. A correspondent to The Polynesian reported in 1846 on the environmental change at the Wailuku plain, the isthmus area between two Maui volcanos. He noted that the area previously had trees at least six inches in diameter growing there, but

Not a bush is now to be seen. The goats and cattle have exterminated the grass and dug up the soil of the plain, which dried by the sun, is now moving in drifts to the leeward into the ocean ... The windward beach was once kept in place by vines ... [it] is now travelling in huge wave-like heaps to the other side. The sand may be said to make a beach clear across the isthmus. It is also filling up a large pond... ("Maui Correspondent" 50)

In the 1840s it became increasingly difficult for ali'i to mobilize labor to maintain the fishponds, and many steadily fell into decay. George Bates, a visitor in 1853, saw the large fishponds in Kanehohe, which he described as owned by the king and his principal chiefs. The fishpond walls were built when "chieftains could command the bodies, souls, and lives of the common people; but now, portions of them were beaten down by the ever-rolling tides" (114). Later on Moloka'i Bates passed the "ruined walls of immense fish ponds" (269).

Throughout this time period, there is little evidence that fish from larger ponds were ever redistributed, although as earlier noted chiefs like Ka'ahumanu kept many foreigners well supplied with fish in the 1820s and early
1830s, in part from her fishponds. The only other example is from 1828 when during a storm "a very large fish pond at Koolau broke away; the fish were innumerable. Orders were given by the King for everyone who chose to go over and have as many fish as they could carry" ("Honolulu" 81). However by 1840 there is at least some evidence that fish from certain ali'i ponds were being sold commercially.

An editorial in The Polynesian in 1840 implied that Kuakini sold fish from his ponds at Kailua, for they were reported as the best ever eaten, and all visitors to Kailua were urged to be sure and try them ("Gleanings" 26). In 1847 Jarves visited Kilauea, and apparently with reference to the royal fishponds at Hilo noted "We would recommend every visitor to taste the mullet from the King's ponds; they are always to be had at a trifling price, and better fish he will nowhere get" ("Editorial" 102). Walpole also visited the "King's fish ponds" on the way to the volcano, and noted that "These are a great source of revenue..." (2: 227). Chester Lyman, who visited the same ponds a year earlier, stated flatly that "fish from the ponds cannot be purchased at any price." He did observe many men engaged in fishing in the ponds, so that either he was mistaken as to the final destination of the fish, or a change occurred before 1847. Earlier in 1842, George Simpson had noted the ruined fishponds in Waikiki, but commented that the fishponds "are still maintained at Honolulu, regularly
furnishing its market with fresh-water mullet" (1: 256). Because of the fishponds, Simpson found that the price of fish in the market, while variable, was always moderated.

Hence even before 1850, many fishponds had disappeared or had fallen into disrepair. Others were leased or given to foreigners. Some of these, as well as some retained by ali'i were beginning to be used as private resources and their products sold at the market.

It seems probable that the shortage of fish which occurred at different times and in different places was primarily due to the near collapse of the traditional social relations of production. Ali'i increasingly did not support benthic and pelagic fishermen nor organize labor for fishing activities. Fishponds were either reserved for ali'i, leased to individuals who sold the fish, or allowed to fall into disuse. The traditional tabu and expropriation rights that ali'i could exercise over their fisheries were sometimes abused. Labor was diverted to a variety of activities including sandalwood collection, church and house construction, and the agriculture necessary to provision the ships. Nonetheless, much of the traditional system of owning and using the fisheries was still in place at the beginning of 1839. By the end of 1851, it had disappeared almost entirely.
WESTERN LAW AND THE SOCIAL RELATIONS OF PRODUCTION

The year 1839 began a twelve year period which completed the transformation of the social relations of production in Hawai'i. The changes created by law were themselves a response to the earlier changes which had occurred in the sixty years since western contact. As a result of these earlier changes, living standards for many maka'ainana had deteriorated, as Caroline Ralston has also contended (36). Much of this deterioration can be traced to a change in the social relations of production. These relations had been dramatically altered in the years since 1778, but they were not yet capitalistic. After 1850, they were.

In the American perception the major cause of the declining living standard of many commoners was indolence: the people simply did not work very hard. They did not work hard in part because they did not want anything beyond an "animal existence" (Answers 6). But there was no hope of stimulating wants as long as people were subject to excessive and erratic ali'i taxation and demands. Initial changes from 1839-1842 involved an attempt to decrease and regularize land, labor and poll taxes and to minimize ali'i expropriating powers. For Americans as well as other foreigners, however, the fundamental reason people did not produce was tied to the manner in which the basic resources of production were owned. To encourage industry and high
productivity, land needed to be individually owned and the ocean needed to become a common property resource.

As will be discussed in this section, in the case of the ocean that goal was never entirely reached. Instead there emerged the concept of certain fishery rights as private property, a situation that one scholar termed "unique in the eyes of English common law" (Kosaki n.p.). The concept of private fishery rights was equally unique in the context of traditional Hawaiian culture. In contrast to the evolution of anomalous private fisheries, most of the ocean fisheries became common property and the ali'i became forever severed from any role in maritime production.

The early laws addressed many areas of the culture besides fishing, but some of these restrictions indirectly affected maritime production. An 1842 law prohibited all "unnecessary" kinds of work, including fishing, on Sunday (Thurston 51). In another provision, the parents of children between the age of four and fourteen who did not send their children to school were forbidden to "fish on those fishing grounds which the King gives to the people" (Thurston 40). These laws acted in minor ways to restrict access to the fisheries, but were of relatively little importance.

Land, labor and poll taxes were also regulated by the early laws. Payment of the land tax was requested in money if possible, but if not other "valuable property" such as
kukui nuts, arrowroot, or tumeric were acceptable. In areas where fish were plentiful the tax could be paid in fish. Some of the standard items of the past, including tapa, fish line and fish nets, were no longer accepted although if no "article of a fixed value" was available the tax could be paid in hogs (Thurston 55-56).

The main impact on the fisheries however was due to several laws initially adopted in 1839 and revised and ultimately published in 1842. The critical passages essentially abolished the traditional system and established a new system regulated by law:

His majesty the King hereby takes the fishing grounds from those who now possess them, from Hawaii to Kauai, and gives one portion of them to the common people, another portion to the landlords, and a portion he reserves to himself. These are the fishing grounds which his Majesty the King takes and gives to the people; the fishing grounds without the coral reef, viz. the Kilohee grounds, the Luhee ground, the Malolo ground, together with the ocean beyond. But the fishing ground from the coral reefs to the sea beach are for the landlords, and for the tenants of their several lands, but not for others. (Thurston 21)

The kilo-he'e and luhe'e were octopus grounds lying outside the reef in relatively deep water in the inshore zone. The mālolo grounds were the habitat of flying fish, one of the pelagic fish often found close to shore. The mālolo traditionally occupied a zone seaward of the luhe'e zone, as described in chapter three. Until 1839 the sea attached to the ahupua'a clearly included these three
traditional zones. The king also gave the people "the ocean beyond," but the fact that none of the specific benthic and pelagic zones were mentioned by name may indicate that by 1839 these areas were not normally viewed as part of the land. In any case, the law made all areas seaward of the reef common property.

From the ocean edge of the reef to the beach the fishery belonged to the landlord and his tenants. In 1846 the landlord or konohiki fishery rights, as they came to be called, were modified as follows:

The fishing grounds from the reefs, and when there happen to be no reefs from the distance of one geographical mile seaward to the beach at low water mark, shall in law be considered the private property of the landlords whose lands, by ancient regulation, belong to the same; in the possession of which private fisheries, the said landholders shall not be molested ... The landholders shall be considered in law to hold said native fisheries for the equal use of themselves and of the tenants of their respective lands; and the tenants shall be at liberty to use the fisheries of their landlords, subject to the restrictions in this article imposed. (Statute Laws 90-91)

The landlord was permitted to tabu a particular species or variety of fish for his own use, and commoners were forbidden to take that type of fish even if it swam into the zone considered common property. In addition, if the landlord laid a protective tabu on all fishing, the fishermen were required to give him two-thirds of their catch after the tabu was lifted. This was modified in 1846 so that the landlords could choose one of two options. They
could continue to set aside one species of fish for themselves on their fishing grounds. In lieu of this the landlord could, after consultation with the tenants, prohibit all fishing for a period of time; when fishing resumed, the tenants were required to pay the landlord one third of the fish taken (Statute Laws 91-92).

The king initially reserved the right to periodically place a "protective taboo" over certain named fishing grounds on O'ahu, Maui, and Moloka'i. On Lana'i, Hawai'i and Kaua'i the king could tabu particular species of fish, including the bonito (aku) on Lana'i and the albacore or 'ahi on Hawai'i. In addition all "the permanent shoal fish of Niihau, and all the transient shoal fish from Hawaii to Niihau" were tabued for the king. When fishing was permitted, whether by commoners or by landlords, two-thirds of the fish taken were to be given to the king (Thurston 22). Seven types of fish were specified as "transient shoal fish", including the kawakawa, a small tuna, and the alalauwa or young aweoweo (big eye) (Thurston 54).

The 1846 revision of these laws reduced the king's share of the catch to one-half. In addition, in certain areas the landlord was entitled to one third of the catch if "the prohibited fish of the landlord ... mingled with the royal fish" (Statute Laws 92).

These laws "freed" all the ocean beyond the reef (or if there was no reef from a mile off shore) and turned it into
a common property resource. The landowner of each ahupua'a retained the fishery from the reef to the shore as part of his private property, although tenants of his land had the right to fish there. The landlord could tabu one species of fish for his own use, or he could seasonally tabu the entire fishery and receive one-third of the catch when the grounds were opened. The king retained the right to half the catch on certain inshore fishing grounds, plus the same right for specific fish caught off particular islands. Fishermen were also required to turn over to the king half the catch of seven specified transient fish wherever they were caught.

The administration and supervision of the fisheries (which included the sale of government fish) was placed under the jurisdiction of a newly created Department of Interior (Statute Laws 20, 93). Government agents were responsible for announcing to the people the fish and grounds tabued by the king, as well as ensuring that the appropriate proportion of fish was turned over to the government. Enforcement of the law was a problem, and by 1846 the penalties were quite severe. Fishermen who caught fish protected by the king's tabu out of season, or took the fish without giving the government half, not only forfeited all fish in their possession but were required to pay "five fold for all fish thus taken." Imprisonment "at the discretion of the court" was also possible (Thurston 94).
The government's portion of the catch of "royal fish" was sold for general revenue or set aside for use of the royal palace (Statute Laws 93). One goal behind the fishery laws was to increase the productivity of the fisheries, and hence increase the revenue which became available to the government. The Minister of the Interior reported in an 1847 issue of The Polynesian that productivity had diminished since the fisheries had been freely opened to the public, and as a result "The net avails to Government have been only $443.87" ("Report"). By the next year the Minister reported:

The amount of Revenue derived from Tabooed Fish during the past year was $1207.36, showing an increase of $763.55, over the income from the same source reported by me last April. This increase is attributable to an improved system of management in its collection. ("Report")

Obviously royal fish produced little revenue for the government, and enforcement was difficult. The process of collecting fish from individual fishermen all over the islands and then transporting them to possible markets was costly and probably frequently wasteful. Many believed that productivity had not increased because, as a new law stated, "the piscary rights of the government as managed by the fishing agents are a source of trouble and oppression to the people" (qtd. in Jordan and Evermann 365). As a result, in 1851 all government fishery rights were granted to the people, and this law became part of the new Civil Code in
1859. Since by then government lands were a legal entity distinct from crown or konohiki lands, the law went on to state that

> All fishing grounds appertaining to any government land, or otherwise belonging to the government, excepting only ponds, shall be, and are hereby forever granted to the people, for the free and equal use of all persons... (Civil Code of the Hawaiian Islands 83)

While the government retained the right to forbid the taking of any fish during certain seasons, "for the protection of such fishing grounds", essentially the king as head of the government had relinquished all ownership or use rights in the fisheries. The ocean beyond the reef or the one mile limit, plus all species of fish in that area, were now a common property resource which the government could only regulate. Areas of the inshore zone from the reef to the shore were also common property if they were adjacent to the million plus acres of government land. Konohiki fishery rights were still applicable to the oceans off all other lands. Except for those rights, and the ocean fishponds, the legal concept of the ocean around Hawai'i was the same as that of the United States.

The creation of konohiki rights in 1839 may have caused further decline in the productivity of the inshore fisheries in the 1840s. The law set severe penalties for fishermen who took tabu fish or who did not turn over half the catch
to the landlord. As it operated in the 1840s, konohiki rights may have been more oppressive than the earlier system.

Landlords were supposed to announce their tabu fish or seasonal prohibitions to their tenants, and these tabus were to be published along with the government's in The Polynesian (Statute Laws 91). All landlords were to notify the Department of Interior with regard to their tabu fish.

One letter, from the chief Kekukahiko to John Young (Keone Ana) stated:

I inform you, honored one, of the prohibited fish of my land of Kaalawai, ili land [an ili kupono] at Waikiki. The prohibited fish is the kala [a surgeon fish], is forbidden according to the laws of the King and the honored Minister passed in their honorable council for the benefit of the people. ("Kapu Fish at Kaalawai")

Almost any kind of fish could be prohibited, and ali'i seem to have frequently chosen highly desirable fish which were common in their fishery. A list of prohibited fish from Kaua'i and Ni'ihau indicated that the octopus was most frequently tabued. The uhu (parrot fish) and the moi (threadfish) were other fish favored for tabu. Many types of fish were prohibited by at least one ali'i however, and the list included everything from the tiny 'o'opū to the popular mollusk, the 'opīhi ("Land Matters").

The king also had konohiki rights over lands for which he alone was the landlord. Like other landlords, the king
tabued common, desirable fish in his fishery. One list of
the king's land in the windward O'ahu districts of
Koolaupoko and Koolauloa included six ahupua'a and five ili.
On these lands the octopus was the primary fish tabued, but
uhu, mullet, and young big eye were also listed ("Kapu Fish
on Oahu").

In the 1840s some foreigners viewed the newly
established konohiki rights as even more oppressive than the
traditional system. Primarily this was because many lands
had more than one landlord prior to the mahele, and hence
several people would exercise konohiki rights over the
fisheries. The new laws had given landlords the right to
tabu one type of tree as well as one type of fish, and on
Moloka'i Rev. Harvey Hitchcock complained that the number of
konohiki had increased. Due to the "cupidity of various
headmen" so many trees and plants were tabued that "nothing
remains in the forests for the people." As for fishing,

The law allows the konohiki to tabu one kind of
fish only, and that only for a set time, and not
the year round; but it is a fact that several
sorts of fish, on the same land, are tabued, and
that such tabus are kept up the year round; thus
depriving the people of a very important source
of support. (Answers 38-39)

Hitchcock raised a variety of questions which needed to
be clarified in order to solve the problem. Particularly,
he believed the term konohiki should be more specifically
defined, and some limit should be placed on how many
konohiki the same land could have in the legal sense. He
also raised a question which revealed the apparent practice of some ali'i:

Does the tabus on the one kind of fish last the year round, or are there seasons in the year when said fish is noa [free]; and will the laws allow the konohiki to change the tabu during the year, and choose some other fish at a certain season because it is more plenty" (Answers 41).

The land division between the ali'i and the king, and the subsequent division of the king's land into government and crown lands, effectively clarified the issue concerning the number of landlords. As ali'i began to sell and lease their lands, and as Hawaiians and other residents were given grants in fee simple, the courts were forced to decide how these activities affected konohiki and tenant rights in the fishery.

When Hawaiians filed their claims before the land commission, they usually only provided the name of the land and a description of its general location. Although fishponds were specifically claimed, rights to fisheries were often not mentioned. Other claimants did include a statement as to their fishery rights, and usually included a statement to the effect that they claimed such rights to the extent not prohibited by law. A typical example of such a claim was that of Kawano ma, a petition on behalf of several households for fifteen separate land claims. Included was a petition for the "edge of the sea, ... deep sea, the fish
which are not prohibited under the law, seaweed, and I'a maoli [indigenous fish?]" (L.C.A. 9811-9825 Native Register 6: 508).

Regardless of whether fishery rights had specifically been claimed or not, the Hawaiian Supreme Court concluded in 1858 that "Those persons who formerly lived as tenants under the Konohikis but who have acquired fee simple title to their kuleanas, ... continue to enjoy the same rights of piscary that they had as hoaainas [tenants] under the old system." In addition, the court concluded that anyone who purchased land in an ahupua'a, or in any way became a lawful occupant, would automatically gain "the right of piscary" without a specific statement to that effect. The konohiki was judged to hold the fishery as private property, though without exclusive use of that private property (Haalelea v. Montgomery 71).

In addition to the fisheries, fishponds had been significant producers of fish in the traditional system. The laws of the early 1840s had no effect on fishpond use or ownership. When the land passed into private ownership after the mahele, the fishponds did also, even those loko kuapa which were built entirely out into the sea. Those ali'i who filed their claims with the land commission specified their ownership of any fishponds, and were awarded many such ponds (Kikuchi 106-110). Even if the maka'ainana had the use of some ponds, it would have been difficult for them
to claim the pond as part of a kuleana grant. Ali'i certainly claimed the major ponds, although they no longer had a claim to the necessary labor to maintain the ponds. Even before 1850 many of the ponds were leased, and harvested for the market, as noted earlier. A clue as to techniques used can be gained by the fact that in 1850 the use of 'auhuhu to catch fish in ponds, lakes or reservoirs was made illegal (Jordan and Evermann 365).

In summary, by 1851 the social relations of production which had governed the maritime economy were totally destroyed. Konohiki rights, which survived the 19th century and into the 20th, were but a mutant offspring of the traditional relations. The legal changes in the 1840s through 1851 did "free" most of the ocean so that unrestricted fishing could occur. It finalized the separation of ali'i from maritime production. That production would now take place under a capitalist mode.

POSTSCRIPT: THE FISHERIES AT ANNEXATION

Certain events after 1850 provide additional documentation for what had happened to the maritime economy prior to 1850, and provide an appropriate conclusion to this research. Capitalizing on the basic changes implemented by 1850, plantation agriculture finally became significant in Hawai'i after 1870. Success in part was due to the importation of large numbers of laborers, primarily from China and Japan.
These new immigrants increased the demand for fish, and many very quickly moved into commercial fishing in the benthic and pelagic zones. By the turn of the century, when the United States commissioned an in-depth study of the fisheries as part of the process of annexation, John Cobb commented that "the Japanese fishermen deserve great credit for developing and extending the deep-sea fisheries, which the native fishermen had allowed almost to die out ..." (Commercial Fisheries 481). Cobb was also highly critical of Japanese fishermen for using destructive fishing methods and for monopolizing the marketing of fish. Both Hawaiian and Japanese fishermen were criticized for continuing to use dynamite (introduced as a fishing technique after 1850) even though its use was outlawed in 1872. Jordan and Evermann, who participated in the same fisheries study as Cobb, noted "the great destruction ... still being wrought to the fisheries by the use of this explosive..." (369).

Cobb also noted that fish pond destruction continued rapidly after 1850, and that many ponds near Honolulu and Lahaina had been filled in to permit building construction. Others had been destroyed for rice production, and most of the rest had been leased to Chinese, who were criticized for working "in close harmony" to limit production and keep the price high (Bulletin 749).

Since many of the fishponds were technically part of the ocean, Jordan and Evermann commented that private owner-
ship of such ponds was "contrary to American precedents." Nonetheless, they felt that the "best interest of the fisheries" would be served "by leaving their present owners in undisturbed possession" (371). With regard to konohiki fishing rights, Jordan and Evermann noted that "The act establishing the Territory of Hawaii wisely provided for the extinction of such titles" (371). The intent of the United States was to convert all fisheries into common property, a goal that was only partially accomplished. (See Kosaki for an excellent summary of 20th century attempts to extinguish konohiki fishing rights.)

Cobb agreed with the U.S. government's intent to "free" the fisheries, but was worried that the fisheries would deteriorate even further unless the Territory passed new legislation, since he believed many konohiki were now using their rights to prohibit public fishing during the spawning season of popular fish (Commercial Fisheries 437). Jordan and Evermann also noted that since "everybody had to account" to the konohiki when fishing, the konohiki "could easily prevent the use of destructive forms of apparatus or overfishing" (370).

In general the various publications on Hawaiian fishing which followed U.S. annexation found the fisheries not only already in a deteriorated condition, but still "rapidly decreasing" in certain areas, primarily due to overfishing of the inshore zone (Jordan and Evermann 371). This was par-
particularly true of the fisheries around O'ahu, where as noted overfishing had probably started before the 1830s. Even on Kaua'i the fisheries were either so overfished (inshore) or underfished (benthic and pelagic) that Cobb reported many residents found "it impossible to secure fresh fish at any price during the greater part of the year and are forced to depend upon salted and canned products" (Commercial Fisheries 489). In his overall assessment of the Hawaiian fisheries Cobb noted that the "domestic fisheries at present are totally inadequate to the demand, and as a result enormous quantities of fresh, canned, salted, smoked, dried, and pickled fishery products are imported each year..." (Commercial Fisheries 450).

His assessment becomes particularly significant when it is noted that in 1900 the population of Hawai'i was still only 154,000, at least 100,000 less than in 1778 (Schmitt, Demographic Statistics 11). It was the traditional maritime productive system which had prevented overfishing, preserved the environment, and provided fish for some 250,000 people. Between 1786 and 1850, as a result of ali'i involvement with Americans as trading partners in the capitalist world-system, the Hawaiian maritime system had disintegrated.
CHAPTER SIX
SUMMARY AND CONCLUSION

The capitalist mode of production and the kinship mode of production "collided" in Hawai'i as they did in so many other areas of the world in the 16th through the 20th century. Agents of the capitalist mode initiated both the collision and the process of cultural change. In areas with developed chiefdoms they often found willing allies among the chiefs, as was the case in Hawai'i. The effect on indigenous subsistence systems and indigenous ecological systems was typically negative. The result was often a decline in the living standards of the general population, and the beginning of continued environmental depletion, although these were often the unintended consequences of the process of acculturation. In one sense, Hawai'i is simply another example that can be used to document the process described by scholars like Eric Wolf, Richard White, William Cronon, and Francis Jennings, all of whom have tried to examine cultural collision primarily from the perspective of the indigenous culture.

In another sense, like any culture Hawai'i in 1778 was a unique society, and the effects of cultural collision were not exactly duplicated by any other culture's experience. The spread of the capitalist mode of production was a historical process which changed human cultures in many ways, not the least of which was their productive
relationships to each other and the environment. America was an important part of this process and materially and economically the critical culture with regard to the transformation of Hawai'i. The narrow focus of this research provides both a specific example of a general case and some understanding of how, in this one instance, part of the subsistence base of a culture was destroyed.

Americans came to Hawai'i as part of America's attempts to widen its own participation in the world market system, and in consequence of American's success in depleting marine mammal resources in the Atlantic. Most of the Americans were from New England, an area of the United States where commercial fisheries had been significant from the earliest of colonial times. While most came to Hawai'i in consequence of their pursuit of personal profit, there was little commercial potential for Hawaiian fisheries. American traders and whalers were interested in changing the consumption practices of Hawaiians, and American missionaries in addition were interested in changing spiritual practices, but none of them were particularly interested in changing the maritime mode of production. Yet as documented here not only did the maritime productive system collapse, but in many areas inshore ecosystems began to decline in productivity. It is not that Americans, as agents of a capitalistic mode of production, particularly intended to change maritime production in Hawai'i; the point
is that they so little understood an alien productive system, or its adaptation to a unique environment, that their actions had unintended consequences.

In 1778 the maritime system in Hawai'i was able to produce most of the protein for a relatively large population, and to do so without major depletion of the ocean environment. This was accomplished by intensification of production via aquaculture, and by the exploitation of some 2600 species in three major ecological zones. The knowledge necessary to do this was frequently specialized, and the technology utilized was often specialized as well. Concern for environmental effects was fostered by the ahupua'a system, which essentially limited fishermen to the fisheries of their own ahupua'a. Much of production, not only in the pelagic and benthic zones but in the inshore zone as well, appeared to have been managed and directed by chiefs, who had no choice but to act in ways which would preserve the marine environment.

The American fur and sandalwood traders, as well as other westerners, first gave ali'i an opportunity to acquire resources independently of the obligations of kinship and religion which supported traditional production. The ali'i response to this opportunity is a critical factor in understanding what happened in Hawai'i. For the chiefs, land production could be manipulated to provide provisions for the traders, and later the whalers. After 1820 ali'i
also were interested in small capitalistic enterprises of various sorts, stimulated both by resident American traders and by missionaries. Neither the Americans nor the ali'i could find much market potential in the maritime production system, and the basic withdrawal by the ali'i from participation in that system led to its collapse.

Since traditional ali'i concern with the "form and idiom" of kinship (Wolf 97) and their religious role in terms of the ritual cycle were critical to the maritime production system, the early transition of Hawai'i to a political state, and ali'i abandonment of the traditional religious system is of particular interest. Given the nature of the traditional maritime mode of production, such changes could not occur without serious repercussions on maritime productivity. Hawai'i was in the process of making what John Bennett has called the "ecological transition," but did so during a time of population decline instead of the population expansion ideally predicted in his model (139).

Beginning in the 1830s, Americans assisted with the introduction of legal changes that essentially severed the traditional relationships between Hawaiians and the sea. With regard to the ocean, the changes occurred before those of the land, and as a result the ocean became a common property resource except for the strange legal creation of konohiki fishing rights. By the 1830s shortages of fish
existed despite the importation of fish (including aku and 'ahi) into the islands. In addition, the inshore environment was probably seriously depleted in some areas by 1850, due to overfishing by a population less than a third of what it had been at contact.

The Hawaiian maritime mode of production was a system, and it was that system which was destroyed by Americans and their ali'i allies. The vast majority of Hawaiians continued to practice inshore fishing by traditional methods and often with only slightly modified technology. Certain knowledge, particularly that which involved favored inshore animals and habitats, was never lost. Many religious practices, originally intended to increase fish catches, continued to be practiced into the 20th century. But they were no longer part of a production system which had been such a finely-tuned adaptation to the marine environment. The inshore environment continued to be depleted, and Hawaiian waters continued to be unable to produce adequate fish supplies for the local population.

John Cobb's research on the Hawaiian fisheries at annexation included research on traditional fishing and its change in historic times. He carefully documented the continued existence of most of the techniques described in this research in chapter three. He was impressed by the Hawaiian adaptation to the sea. Cobb concluded:
The advent of foreigners hastened this development [maritime adaptation] by the introduction of appliances in use in their own countries and heretofore unknown in the islands. The earlier American settlers, coming as they did principally from New England, where fishing has been brought to a higher state of perfection than elsewhere in the United States, were especially helpful in this regard" (Bulletin 721).

"Especially helpful" seems an incredible choice of words. Regardless of what can be said about the impact of American culture on Hawai'i in general, Americans were not "especially helpful" with regard to the maritime production system. American needs, the possibility of participation in the world market, and American attitudes and laws toward ocean resources were some of the items the New Englanders brought with them to Hawai'i. As a result, the indigenous maritime mode of production was destroyed, and the inshore environment began its decline. A half century later Americans still could not understand their own impact on an indigenous economic system.
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