INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

8304607

Strate, John Martin

AN EVOLUTIONARY VIEW OF POLITICAL CULTURE

The University of Michigan   Ph.D.   1982

University
Microfilms
International   300 N. Zeeb Road, Ann Arbor, MI 48106

AN EVOLUTIONARY VIEW OF POLITICAL CULTURE

by
John Martin Strate

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Political Science)
in The University of Michigan
1982

Doctoral Committee:

Professor Lawrence Mohr, Chairman
Professor Richard Alexander
Professor Samuel Eldersveld
Professor Fred Willhoite, Jr., Coe College

for my parents -- John Martin Strate Sr. and

Gloria J. (Walgreen) Strate

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF TABLES (continued)

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION: EVOLUTION, CULTURE, AND POLITICS

Perhaps nothing in history has been so remarkable as the political change that has occurred over the last several thousand years. Two aspects of this change are especially noteworthy: a decline in the number of political communities, and an increase in their size and structural complexity (Carneiro, 1978). It is the purpose of this dissertation to contribute to an explanation of this change.

About 10,000 years ago humans everywhere lived in simple political communities called "hunter-gatherer societies " with memberships that totaled anywhere from 25 to 50 individuals (Lee and DeVore, 1968). The economy of these small groups was based upon a division of labor by sex. Men hunted and fished. Women gathered plant food and took care of children. The polity of these small groups was decentralized, ephemeral, and sharply limited in scope. Decision-making was ad hoc and informal. When the situation demanded it, the heads of different families would meet to decide upon a matter of concern to the whole group. Or, upon other occasions, the group would defer to one of its members who through personal reputation was known to make good decisions on certain matters.

It is clear that political authority in these small groups was not authoritarian, dictatorial, or despotic. If these patterns of political authority had existed we would expect to find indicators

1

of social ranking--such as burial sites with precious goods--but these
things have not been found in the archaeological record of hunter-
gatherer societies.

Today, however, humans almost everywhere live in complex politi-
cal communities called "nation states" which have populations that
number into the millions. The economy of these states is based upon
capital investment, specialization of labor, marketing, foreign trade,
and governmental regulation and taxation. The polity of these states
is centralized, permanent, and broad in scope. All states have a
central government which holds or at least claims to hold a monopoly
of political authority. All of these governments are comprised of
permanent offices. The officials who hold these offices generally
do whatever they can given their situation and capabilities to
stay in office. They make decisions on a wide variety of matters and
back these with the potential sanction of physical coercion.

The question of what led to the appearance and spread of com-
plex political communities like the nation state has been a contro-
versial issue in the social sciences for more than a century. I will
argue that there was a single cause--competition and conflict between
groups of humans. Nearly everything which distinguishes complex
political communities from simple ones owes its existence and expres-
sion to this competition and conflict.

Theoretical Approaches

There are many theoretical approaches to the question of what
caused the appearance and spread of large and structurally complex
political communities. The anthropologist Elman Service (1978) has

provided a summary of the most important of these approaches. He divides them into two major groups: conflict theories and integrative theories.

Conflict Theories.

The focus of conflict theories is upon competition and political change. There are three types of conflict theories, depending upon the level at which competition is regarded to be most significant: individual conflict theories, inter-societal conflict theories, and intra-societal conflict theories.

Individual conflict theories see competition between individuals within societies as the cause of political change. Theories of this type include social contract theories and social darwinism. An example of social contract theory is Thomas Hobbes' view that political communities were established by powerful sovereigns for the purpose of restoring social order and preventing general anarchy, or a war of all against all. It was in the self-interest of individuals to submit to the will of a sovereign in order to avoid injury from unrestrained competition. An example of social darwinism is the view of Herbert Spencer's that competition between individuals within society leads to social and political progress. Competition results in "survival of the fittest." Those who are able to adapt to the competition of modern social life and who are capable of contributing the most to their societies survive and reproduce; those who are unable to adapt to this competition perish and/or fail to reproduce.

Inter-societal conflict theories see warfare between political communities as the cause of political change. Two types of political change result from warfare. One type of change results from the

responses of political communities to warfare or the threat of warfare, such as increased defensive preparations. Another type of political change results from conquest and subjugation. Those political communities that are successful in warfare survive; those that are unsuccessful perish.

Inter-societal conflict theories are very old. The ancient historian Thucidydes in his History wrote about the danger to Athens from its imperial ambitions, especially at times when there was political discord at home. In 1377 Ibn Khaldun wrote in The Muggaddimah about the political effects of conflict between nomadic and sedentary societies. The Great Wall of China, which is large enough to be seen by astronauts from outer space, and many other ancient fortifications of lesser size are visible evidence that supports his observations. The foremost cultural evolutionist of the 19th century, Herbert Spencer (1967), introduced the idea that warfare was an important stimulus to political organization. When warfare was intense, political communities would assume features similar to those of military units. Other evolutionists of the late 19th and early 20th centuries included Walter Bagehot (1872), Ludwig Gumplowitz (1899), Franz Oppenheimer (1914), Albion Small (1895), and Lester Ward (1914). All of these authors used Spencer's concept of survival of the fittest to explain the political changes that resulted from warfare.

Some inter-societal conflict theories emphasize the economic dimension of competition to the exclusion of other dimensions. An example is Lenin's theory of imperialism. Lenin thought that capitalist countries went to war to obtain raw materials and to establish and protect markets for their manufactured products. In capitalist

countries the economy was based upon a political system that not only subjugated its own working class but also through colonialism exploited the people of other countries.

In recent years political scientists have introduced the notion of "dependency" to account for patterns of economic exploitation that exist in many Third World countries. The advanced capitalist countries (especially the United States), because of their extensive economic interests in Third World countries, give economic, military, and political support to those elites in Third World countries who will maintain existing patterns of economic exploitation.

Other inter-societal conflict theories look at a broader range of dimensions of competition between political communities. The following are examples.

The anthropologist Keith Otterbein (1970) used data from a worldwide sample of societies to show that political reasons for war are evolutionarily more advanced than prestige, economic, or defense reasons. He found that political communities which used efficient military practices were generally more successful in warfare than those which did not. He also found that political communities which were complex (centralized) used a greater number of efficient military practices than political communities which were simple (uncentralized). These findings suggest that the appearance and spread of complex political communities was due to their success in warfare against less complex competitors.

Inter-societal conflict has also figured prominently in the arguments of scientists trying to understand the evolutionary history of humans. The basic notion is that many distinctively

expressed or unique traits of humans owe their existence to the effects of warfare upon human survival and reproduction.

The anthropologist Sir Arthur Keith (1949) argued that the division of human populations into small, localized groups that were hostile to each other facilitated rapid evolution during the Pleistocene. The duality of human nature is due to evolution in these small groups. As regards relationships within the small group, amity, sympathy, loyalty, and mutual help prevail. As regards relationships with other groups, antagonism, suspicion, distrust, comtempt, or open enmity prevail (p. 6).

The evolutionary biologist Ronald A. Fisher (1958) argued that a widely admired human trait -- heroism in battle -- might have evolved in humans under conditions of barbarism for much the same reason that apparently useless traits have evolved in other species, such as distastefulness in insect larvae. Although a brave warrior might die in battle, his death would add to the prestige of his family's name for generations.

The zoologist Robert Bigelow (1969) looked at the question of whether warfare has been a significant factor in the evolution of human traits. He argued that many of the characteristics of the human brain are due to selection favoring the members of better organized and militarily more effective groups. He pointed out that warfare in history has resulted in migrations of populations and the worldwide dispersion of genes. For example, the explosive radiation of peoples of European descent that occurred in Australia, North and South America, and parts of Africa was due to migrations and the efficiency of their military tactics and weapons.

The evolutionary biologist E.O. Wilson (1975) has argued that
warfare may have had significant effects in the evolution of human
traits. A social predatory mammal that was able to "ponder the sig-
nificance of adjacent social groups and to deal with them in an
intelligent, organized fashion" might decide to dispose of these
neighboring groups and appropriate their territories (p. 573). In
doing this it would "increase its own genetic representation in the
metapopulation" (p. 573). The possession of particular genes would
presumably facilitate the cultural capacity to defeat adjacent social
groups; reciprocally, the possession of the cultural capacity to
defeat adjacent social groups would facilitate the spread of such
genes in the population.

The evolutionary biologist Richard Alexander (1971; 1979) has
argued that the single cause of political communities larger than
simple hunter-gatherer societies is intergroup competition and con-
flict in the context of balance-of-power races. The basis of his
argument is an analysis of the advantages of group living in animal
species. Two of these advantages--increased efficiency in finding
and securing prey, and exploitation of a localized resource--would
not sustain human groups that are the large size of complex political
communities. A third advantage, however--protection from predation--
would sustain human groups that are this large. Large political
communities other things being equal would always give better pro-
tection to their members, from hostile groups of humans, than would
small ones. Alexander also notes that there is little or nothing
in the anthropological or historical record that contradicts the
notion that intergroup competition and conflict were not endemic

throughout human evolutionary history.

The perspective of these scientists is compatible with the approach that I hope to take. It assumes -- and correctly, I think -- that any explanation of political activities and structures, both past and present, must be consistent with the only theory that has successfully explained living things -- the theory of evolution by means of natural selection which was first proposed in 1858 by Charles Darwin and Alfred Wallace. The theory has ample credentials. Since 1858, nobody has observed anything about any living thing that has contradicted it.

Intra-societal conflict theories include class struggle theories and kinship group struggle theories. A well known example of a class struggle theory is Marxist theory. Frederick Engels (1891) thought that the state arose to defend the interests of the wealthy class within society. The advent of technology led to the use of capital for commodity production. This accentuated differences in private wealth.

An example of kinship group struggle theory is the idea of Morton Fried (1967) that the state appeared in situations where kinship groups were not sufficiently strong to hold on to political power. To most anthropologists, lines of cleavage in political communities that preceded the state, such as the tribe and chiefdom, were based upon ties of kinship rather than ethnicity, religion, or social class.

Integrative Theories

The second major group of theories of political change,

according to Service's classification, is integrative theories. The
focus of integrative theories is upon cooperation within political
communities. There are two types of integrative theories: circum-
scription theories and organizational benefit theories.

Circumscription theories focus upon conditions that are exter-
nal to political communities and act as centripetal forces to hold
them together. An example is the idea of Robert Carneiro (1970)
that geographical isolation was a necessary condition for the
emergence of states. He argued that population pressure within re-
gions that were surrounded by deserts, mountains, or oceans led to
warfare and the conquest and subjugation of one political community
(and its population) by another. It was difficult or impossible
within such regions for political communities to migrate if they
were at risk of being defeated.

Other circumscription theories focus upon the existence of
external military threats and the integrative effects of these
threats upon political communities. The classical example in ancient
history is the rise of city states in Mesopotamia and China. These
had defensive walls because of the threat of raiding nomads and
brigands. Circumscription theories are complementary to inter-
societal conflict theories since they suggest conditions under which
warfare leads to the emergence of large, complex political communities.

Organizational benefit theories focus upon the various advan-
tages to individuals of living within political communities. An
example of such a theory is the idea of Elman Service (1975) that
complex political communities like the chiefdom arose because of the
economic advantages of a centralized system of redistribution.

Another example is Karl Wittfogel's (1957) idea that complex political communities arose in regions where extensive irrigation was practiced. Such irrigation was possible, he thought, only if there was a centralized bureaucracy that built, maintained, and controlled the water works.

The Evolutionary Approach

Among these different theoretical approaches to the study of political change, those that are consistent with and can be integrated with evolutionary theory would seem to be the only ones that would have any scientific merit. The simple reason for this is that political activities and structures as components of culture are dependent upon human biology. This biology was subject to the same natural laws as the rest of life.

These laws ascribe to life its distinguishing characteristic which is the ability to reproduce (or replicate). Those traits of living things which enhance this ability in relation to less beneficial traits will increase in frequency. This is the process of natural selection. It occurs because living things are constantly subject to the rigors of hostile forces such as climate, diseases, food shortages, parasites, predators and mate shortages. Some individuals are better able than others because of their traits to reproduce in the face of these hostile forces. These traits increase in frequency in the population since offspring tend to inherit the traits of their parents.

Although nearly all scientists acknowledge that natural selection is relevant to explanations of biological traits, very few acknowledge

its relevance to cultural traits like political activities and structures. There are probably several reasons why so few scientists have accepted evolutionary theory as a paradigm for the study of culture.

One reason is problems in evolutionary theory itself. The classical theory was unable to account for behaviors that were apparently disadvantageous to individual survival and reproduction. An example of such a behavior is altruism, as when a soldier falls on top of a live hand grenade to protect other members of his unit. Another example is nepotism, as when a political leader leaves office in favor of one of his sons. Another example is reciprocity, as when a congressman votes favorably on a bill in the expectation (but not guarantee) that his colleagues will return the favor. All of these behaviors do not seem to bring any immediate advantage to the individual, and therefore, according to classical theory, should not exist.

Another reason was that the gap between the social behavior of humans based upon the possession of culture and that of other species seemed enormous. The possibility of biological explanations of cultural traits seemed remote at best.

Now, however, both of these reasons for the rejection of evolutionary theory as a paradigm for the study of culture are no longer valid. First, substantial revisions to evolutionary theory have made it possible to explain behaviors that previously were not understood. Second, there is now greater understanding of the function of culture and its connection to evolutionary processes.

Revisions to Evolutionary Theory.

A number of problems in evolutionary theory have until recently discouraged its use as a paradigm for the study of social behavior. The most significant of these was understanding the particular level in the hierarchy of life at which natural selection was effective.

The origin of this problem is traceable to Darwin's time. Darwin and his contemporaries did not know the mechanism of inheritance but expected to find that inheritance involved the blending of parental traits since observation showed continuous variation in most traits. For this and other reasons the research by Gregor Mendel (1866) on the inheritance of characters in the garden pea was largely ignored, and it was not until 1900 that Correns, DeVries, and Tschermak rediscovered this work and founded the science of modern genetics.

We now know something that Darwin did not know about the mechanisms of inheritance. Individuals do not, as Darwin thought (1872: 140-144), inherit the acquired traits of their parents. Instead, they inherit (some of) the genetic material of their parents. And in sexually reproducing species, variation in traits from generation to generation is not sustained, as Darwin supposed (1872:160-161), by reversions to ancestral traits. Instead, it is sustained by the inheritance of genetic material that is particulate.

The discovery of particulate inheritance should have resulted in greater attention by evolutionary biologists to the interrelationships that existed between different units in the hierarchy of life (genes, supergenes, chromosomes, individuals, kin groups, demes, populations, and species). It should also have resulted in greater attention to the significance of these different units to natural

selection. Unfortunately, this did not happen. Instead, most evolutionary biologists ignored these problems and worked under the assumption that whatever traits existed did so for the good of the population or species (see, for example, Wynne-Edwards, 1962).

It is apparent that Darwin himself was occasionally careless in identifying the particular level in the hierarchy of life at which natural selection was effective. This is evident from his discussion of the neuter castes in ant species (1872:270-273). Presumably, if his theory were true, selection should act on the fertile ants alone and neuter castes should not exist. Darwin resolved this "most serious special difficulty" by arguing in favor of selection at the family level or for the "survival of the communities with females which produced (the) most neuters having the advantageous modifications." Later, however, he talks of selection at the individual level or of "natural selection...acting on the fertile ants or parents."

The question of the level at which selection acts has been now, more than a century later, mostly resolved. Aside from the possibility of a few rare cases of selection at the group level, the evidence is overwhelming that selection acts at a level no higher than that of the individual (Williams, 1966). However, our understanding of how selection at this level occurs has changed considerably. The classical theory of natural selection, which focuses only upon the differential reproduction of individuals, cannot alone account for phenomena such as the neuter castes and other apparent types of individual self-sacrifice (or altruism).

To account for these phenomena, W.D. Hamilton (1964), in a

landmark paper, introduced the concept of inclusive fitness. The total fitness of an individual was comprised of <u>several</u> components. One component, already accounted for by the classical theory, measured the contribution to the individual's fitness from his own reproduction, measured by the number oi offspring raised successfully to adulthood (or more appropriately, by the total number of the individual's genes carried by these offspring). A second component, not accounted for by the classical theory, measured the contribution to the individual's fitness from the reproduction of relatives to the extent that assistance given by the individual to his relatives enhanced this reproduction. The possibility of such a component depends upon the existence of genes in other individuals (relatives) that are identical by reason of descent from a common ancestor or ancestors. The opportunity exists for the individual to enhance his own total or "inclusive fitness" by assisting these relatives to reproduce.

This extension of the classical theory shed new light upon the question of how the neuter castes in the social insects could have evolved by natural selection. For if an individual were related closely enough to a sibling (e.g., a female honeybee can be related by as much as 3/4 to one of her sisters), it might be more advantageous for this individual to be a neuter (or remain neuter) and assist its mother in raising additional siblings than in reproducing on its own, since it may actually be related less closely to its own offspring (e.g., a queen, which is a fertile female, is related by only 1/2 to her own offspring). Such an interpretation was revolutionary. For it soon became apparent to evolutionary biologists that many

puzzling phenomena in nature were not the result, as previous views would have it, of natural selection occurring at the group or population level, but rather of selection at a level no higher than the individual.

This change of view was significant for the study of the evolutionary history of various social behaviors in animals. Many of these resemble human social behaviors, such as nepotism, social dominance, and cooperative group defense. These are of particular interest because in humans they are relevant to politics. A better understanding of the evolution of these social behaviors would presumably result in a better understanding of their expression in politics.

Several conventional methods of analysis are used to study the history and function of biological traits. One of these is the taxonomic method. Another is comparative analysis.

The taxonomic method is used to study the history (or phylogeny) of a trait. A trait which is uniform throughout an entire order, such as the primates, is evolutionarily conservative. That is, it is of ancient origin and is the product of a long history of natural selection. A trait which is variable throughout a higher taxonomic level, such as the genus or species, however, is evolutionarily labile. It is of recent origin and is the product of a short history of selection. These principles allow comparison of the traits of humans with those of other more or less closely related species and identification of those traits which are conservative and those which are labile. This may help in the identification of the hostile force or forces responsible for the evolution of a particular trait.

The taxonomic method is used most often to make comparisons between humans and the closely related primates of the Old World such as the chimps, the baboons, and the gorilla. Differences in traits between these species are by definition labile. They should be the result of differences in exposure to hostile forces that are of fairly recent origin.

One trait that is very widespread throughout the primates (i.e., is conservative) is a tendency toward polygyny and male dominance systems (Wilson, 1975:516). This tendency also exists in humans. A cross-cultural study by Murdock (1949) found that a large majority of the world's societies allow polygyny. It is also apparent that almost all of the political communities of the world are dominated by men, not by women.

One trait that is variable throughout the primates and therefore is labile is social organization. Some primates, such as the orangu-tan, are solitary. Other primates, such as the gorilla, live in groups in which a single male is dominant. Other primates, such as the yellow baboon, live in multi-male groups in which no single male is dominant. Other primates live in groups of variable structure. The social structure of the hamadryas baboon consists of separate harems that are aggregated at certain times of the day into larger troops. The social structure of the chimpanzee is quite fluid but seems to be based upon a core group of males that defends a territory. This tendency toward variability in social structure is especially marked in humans and is a distinctively expressed trait. Unlike other primates humans live in both small groups such as hunter-gatherer groups and large groups such as nation states.

Presumably, variability in the structure of human groups is due to something in the evolutionary history of humans that was quite different from the other primates.

The comparative method is often useful for learning about the function of biological traits. The basic hypothesis is that the traits of organisms -- whether they involve morphology, physiology, or behavior -- are the product of natural selection and exist because they enhance inclusive fitness.

The comparative study of different species often reveals cases in which two or more species possess similar traits but are only remotely related to each other. This occurs because the species share similar problems. A familiar example of such "convergence" is the possession of wings by both birds and bats (which are mammals).

There are a number of traits that are distinctively expressed in humans such as nepotism and cooperative group defense that also exist in other species that are not closely related to humans. A better understanding of these species might be of help to us in understanding the origin and function of these traits in humans.

The trait of nepotism is especially interesting because of its distinctive expression in humans and its obvious importance in economic, social, and political life. In other species "nepotism" is expressed as various types of assistance between genetically rela- ted individuals such as food sharing, protection, and grooming.

Nepotism is especially prominent in species that engage in group hunting. Some examples are wild dogs (Estes and Goddard, 1967), lions (Schaller, 1972), wolves (Mech. 1970), and some dolphins (Hoese, 1971). This observation is interesting because of the

anthropological evidence which indicates that Homo sapiens was also a group hunter for much of its evolutionary history (Bartholomew & Birdsell, 1953; Dart, 1949, 1953, 1956; Kortland, 1972; Lee and DeVore, 1968; Schaller & Lowther, 1969; Washburn, 1961). A closer study of the function of assistance between related individuals in these species may be helpful in determining the origin and function of nepotism in humans.

The trait of cooperative group defense is also interesting because of its relevance to theories about the appearance and spread of complex political communities. This trait is found in a number of species including various ants (Haskins & Haskins, 1965; Talbot, 1943; Wilson, 1971), some baboon species (Kummer, 1968), the hyena (Kruuk, 1972), and the chimpanzee (Goodall et al., 1979). Anthropological evidence also indicates the likelihood that Homo sapiens engaged in cooperative group defense. There is evidence of intraspecific killing during the Pleistocene (Roper, 1969), and it seems probable based upon what we already know about the prominence of warfare in history that some of this killing occurred in connection with warfare. The existence of warfare, of course, implies cooperative group defense.

One of the objectives of my dissertation is to advance a few exploratory ideas that I think are likely explanations for differences in traits (or similarities in traits) between humans and other species that are relevant to politics. Unfortunately, these ideas cannot be tested very rigorously. A problem in using the taxonomic method is that there are few species closely related to humans. Analysis of labile traits must defend upon arguments that are logical

and consistent with the evidence rather than upon statistical tests
of hypotheses which subsume a large number of species. Also, there
are many gaps in our knowledge of species, their environments, and
their evolutionary history. Sometimes this makes it difficult to
exclude rival alternative hypotheses.

The Function of Culture.

The lack of any apparent linkage between human biology and cul-
ture was undoubtedly the greatest obstacle to the adoption of evolu-
tionary theory as a paradigm for studying human social behavior. If
this linkage did not exist or was unimportant there would be little
point in worrying about the evolutionary history of humans.

The assumption that the evolutionary history of humans is mostly
irrelevant to an understanding of contemporary economic, social, and
political life is very widespread in the social sciences. A political
scientist, for example, is interested in governmental institutions
like bureaucracies, legislatures, and courts and the behavior of
people within these institutions. He is interested in groups like
political parties, protest demonstrations, revolutionary movements,
and so forth. All of these are "cultural" things. Their incidence
and expression varies from one political community to another and
changes continuously. On the face of it, therefore, politics seems
to have little to do with the evolutionary history of humans and events
that occurred thousands or millions of years ago.

In order for evolutionary theory to be true, however, it must be
possible to show that cultural things are functional in the sense that
they enhance the survival and reproduction ("inclusive fitness")

of individuals who construct, use, maintain, and transmit them. Otherwise, it is difficult to see why cultural things would exist. This is because cultural things do not exist independently of the individuals who construct, use, maintain, and transmit them (Alexander, 1979). Something that did not enhance the inclusive fitnesses of these individuals or was not at least neutral in this regard would disappear over time along with these individuals.

A hypothetical example might illustrate this process. Suppose that those who use alcoholic beverages leave fewer descendants than those who do not because they run a greater risk of death by automobile accident and are more likely to have heart and liver problems. If heavy use of alcohol and susceptibility to its intoxicating effects is heritable, those with these traits should be replaced by those without them. The use of alcohol should decline over time in the population.

While cultural things may be found which do diminish inclusive fitness, this should be because of their novelty. A possible example is the handgun. These became widely available only because of the development of inexpensive manufacturing methods. The use of handguns, because of the possibility of accidental discharge, poses a significant danger to their owners and members of their families. It would seem that if this danger became widely known the use of handguns would diminish. The owners of handguns would sell them or dispose of them in some other way. People would not purchase handguns or give them to other members of their family.

Our present understanding of evolution locates the function of

culture as far down in the hierarchy of life as the level of the gene. The effect of natural selection has been to save those genes and combinations of genes that in particular environments have replicated the most copies of themselves. These are the genes and combinations of genes that have insulated themselves (through the production of phenotypes) and copies of themselves located elsewhere (through assistance to other phenotypes where they reside) from the action of Darwin's hostile forces in ways that facilitated their own replication. From this perspective the individual is a "vehicle of replication" of genes and combination of genes. The function of culture like other aspects of the phenotype is to insulate the genes and combinations of genes from the action of these hostile forces.

It is little wonder that such an unusual view of the function of culture has existed for only a few years. In the social sciences, there have been several obstacles to the adoption of this view. The most important of these is the long tradition of viewing function at the societal level.

This tradition had its roots in the appearance of 20th century liberalism. To men like John Dewey and John Maynard Keynes social systems were human artifacts to be manipulated by thoughtful governments for the general welfare. Their philosophy -- liberalism -- rejected the view of social contract theorists like Thomas Hobbes and John Locke, and of social darwinists like Herbert Spencer, that the state necessarily opposed the interests of individuals.

The increasing popularity of liberalism was in large measure a reaction to the visible social injustices that were the products of laissez-faire capitalism. The social darwinism of Herbert Spencer was

flatly rejected. The optimal society would be achieved through govern-
mental intervention designed to achieve social justice. The job of
the social scientist was to tell policy makers how to intervene in
the social system to do this. The theory of evolution was put on
the shelf and forgotten. The appearance of culture supposedly had
enabled the human species to transcend its biology.

The rejection of evolutionary theory by social scientists was
an unfortunate event in the history of science because there was no
valid scientific reasons for it (see Corning, 1971). No evidence had
been presented against natural selection as the principal mechanism
of organic change. Rather, the rejection was mostly politically
motivated since evolutionary theory seemed to threaten many cher-
ished liberal values as if the "had been" of evolutionary history
implied "ought to be." It was also due in part to moral revulsion
at the thought that supposed "knowledge" of evolutionary processes
would be used by misinformed or evil persons to promote their own
vision of a better world—as actually happened with the eugenics
movement and the Nazis of Germany.

In any case, succeeding generations of social scientists seemed
either to be unaware of evolutionary theory or to be of the opinion
that it was of little importance to the study of human culture. This
left the field open for the more creative social scientists to pro-
pose their own theories. The most popular of these were variants
of the "systems paradigm" that grew in influence in the years follow-
ing World War II until they were accepted for the most part without
serious challenge. In nearly every case, however, these theories were
not put to a rigorous test. They tended to be so general, so vague,

and so complex that fellow scientists often had difficulty in just following what was being said, let alone coming up with testable hypotheses that everyone could agree upon as being important.

Sociologists and political scientists took the existence of societal level functions as virtually axiomatic. The influential sociologist Talcott Parsons (1937) talked about separate subsystems that dealt with four different societal functions: adaptation, pattern maintenance, goal attainment, and integration. These subsystems interacted with each other to insure a social equilibrium. The political scientist David Easton (1965) introduced into the systems paradigm some concepts such as input, process, output, and feedback that he had borrowed from the technical field of systems analysis. These were to provide a framework for analyzing the black box of the political process, or policy making. The political sociologists Gabriel Almond and James Coleman (1960) argued that there were five input functions—interest articulation, interest aggregation, political recruitment, political socialization, and political communications—and three output functions—rule formation, rule application, and rule adjudication. These functions were supposed to be found in every viable political system.

It is now evident that the colleagues and students of these theorists were either too confused or too intimidated by these systems paradigms to bother asking some very basic questions: When did such systems first appear? Why do they exist? How can you tell when they no longer exist? Few seemed either to know or to care. And, in any case, the systems paradigm had already proved useful as a way of categorizing a bewildering variety of economic, social, and

political phenomena that had been observed cross-nationally. This was at least a first positive step toward doing useful empirical work.

Anthropologists also found the systems paradigm to be attractive. At the turn of the century, the ideas of the early cultural evolutionists such as E.B. Tylor began to lose out to the idealist perspective of Franz Boas (see Hatch, 1973). A culture was to be understood not so much by its relationship to a physical environment as by the way its members thought about it. Furthermore, a culture had to be studied in its entirety as an integrated system, which discouraged isolating its parts and studying them in relation to other cultures.

In the 1930s and the 1940s there was a sharp negative reaction to idealism and a return once more to materialism. This time, however, it was a materialism that mistakenly located function at the societal level. The question was how societies interacted with their environments to keep certain ecological parameters within equilibrium values. Such a focus led to the following types of hypotheses: the nuclear family was society's way of resolving the problem of too many people on too little land; the practice of female infanticide was one of the ways a society could control excessive population growth; economic specialization was a way a society insured high productivity. These hypotheses, which could be multiplied endlessly, are examples of the sort of thinking that the systems paradigm encouraged. It was just taken for granted that cultural traits were necessarily part of an interrelated complex that was somehow functional for the group as a whole.

Clearly, there was nothing wrong with adopting a systems paradigm as a tentative theory to be tested. Indeed, if one were to go about testing the theory that the function of cultural traits existed at some other level—for example, at the individual level—one would want to use the systems paradigm as an alternative hypothesis to see if it could be rejected. Yet with the exception of a few social scientists, notably among the economists, the hypothesis of function at the individual level seems never to have been counterposed to the hypothesis of function at the group level. One social scientist who did do this, however, was Harold Hotelling. The work in which he did this (1929) is now a classic case in economics since his test had such decisive results.

Hotelling asked the question of where two competing businesses would locate their stores in a town with a single main road. The socially optimal solution would minimize customer transportation costs. To do this several businesses would locate their stores at some distance from each other on either side of town. As everyone knows, of course, this is not what happens. Such competing businesses almost always locate their stores near the center of town. If one of the businesses did move from the center of town, it would lose customers who lived closer to the store of its competitor.

This example is illustrative of how the predictions flowing from an hypothesis of individual level function are often quite different from those presuming group level function. To take the existence of group level functions as axiomatic is simply wrong. Much of culture is differentially beneficial to individuals, and this factor breeds politics.

A second problem in understanding cultural traits, aside from the difficulty in determining the level at which they functioned, was the confusion generated by the observation that many of them seemed to be so arbitrary (see Alexander, 1979:82-86). Many of the characteristics of cultural traits, as in architecture, art, clothing, dance and music, seem to depend largely upon short run considerations of style, fashion, and trend—indeed, so much so that much about culture seems to be haphazard or even disfunctional. It is difficult to see anything functional, for example, in the movement of hemlines up and down or the replacement of rock-and-roll by disco. There appeared to be no necessary connection between the direction taken by culture and such basic human needs as finding food and water, shelter, and clothing. The lack of any visible connection persuaded some social scientists that cultural traits have a life of their own that is independent of human need or design. These traits are even capable of "evolving" since by their effects on individuals they can outreplicate competing cultural traits (Richerson and Boyd, 1978). In doing so, they may even be harmful—reducing the fitnesses of these individuals.

There are a number of things wrong with this view. First, the search for function has often been abandoned too readily. It is often of great advantage to individuals in fields like architecture, art, fashion design, and entertainment—and also to those who are relatively early adopters of change—to promote change in certain directions rather than others. If they are able to do so, the change to culture that results is functional in the very narrow sense that it benefits those few individuals who are able to control the pace

and direction of change. This is so whether the overall effects of the change upon other members of society are beneficial or deleterious. As an example, policy innovators in bureaucracies often benefit directly in terms of prestige and budget shares when they succeed in establishing a new program -- whether or not the overall benefits of the program are worth its costs (Bardach, 1972; Meltsner, 1976). This suggests that we cannot expect a priori to find function at the group level since the implication of the theory of natural selection is that it is somewhere else, namely at the individual level or below.

Second, as I pointed out above, cultural traits do not have a life of their own. The ability of cultural traits to spread depends entirely upon whether individuals construct, use, maintain, and transmit them. In turn, the inclusive fitnesses of individuals are affected in some measure by whether their cultural traits are functional.

Politics and Function

Although the word "function" has different meanings, I will use it to mean "the normal or characteristic action of anything" (Webster's New World Dictionary). Using this definition, the function(s) of political communities, if the intergroup competition and conflict argument is true, should be linked with the protection that political communities afford their members from the attacks of hostile groups of humans. Other benefits derived (i.e., other functions) from living within political communities should be either incidental to or consequential to protection or defense.

If the necessary and sufficient function of political communities is defense, the characteristics of political communities should

reflect this. There should be a very high incidence within political communities of activities and structures that are linked with defense. The incidence of other activities and structures should be less and should be positively correlated with the closeness of their linkage to problems of defense.

Activities and structures linked with defense affect the chances of entire political communities to survive. The failure of a political community to defend itself has widespread repercussions for its cultural traits. Those linked with political activities and structures, such as bureaucracies, courts, and legislatures, may disappear entirely, along with the military units that defended them.

Another implication of the evolutionary approach is that culture is the most important component of the environment into which individuals are born, grow up, reproduce, raise children, and die. Individuals should respond to culture in ways that are most advantageous to their own survival and reproduction but should find that this is difficult to do. The reason for this is that societies are comprised of other individuals who are genetically different and who respond to culture in ways that are advantageous to themselves and not to others. The consequence of this is competition. As individuals become more or less successful in such competition by exploiting culture for their own advantage or by changing culture in the directions that they prefer rather than others, aspects of culture become differentially advantageous to the members of society.

This should be as true of political communities as it is true of other aspects of culture. As individuals exploit them for their

own advantage or change them in certain directions rather than others, aspects of politics will become differentially advantageous.

Those who are most involved in politics--elites--should construct, use, maintain, and transmit political activities and structures in ways that enhance their own survival and reproduction. In doing this (or trying to do this), elites encounter at least two problems.

The first of these is a problem of external polity--insuring the survival of the political community. In order for elites to use their positions of power for reproductive advantage, they need to keep their political community from being defeated in warfare. Otherwise, their positions of power and their perquisites may be lost. This is largely a problem of defense. An adequate military force must be recruited, trained, and equipped. It is also a problem of foreign policy. Appropriate alliances must be struck with other political communities.

The second of these is a problem of internal polity--finding a way to control, reduce, or eliminate any threat to their own positions of power that may come from within the political community. This is partly a problem of insuring good government and reducing the costs that individuals suffer from intensified competition within political communities. It is also partly a problem of fending off challenges to their positions of power from other individuals and groups within the political community.

Data and Methods

The major objective of my dissertation is to show that the political change that has occurred over the last several thousand

years was a consequence of intensifying competition and conflict between political communities. In doing this I hope to show that intergroup competition and conflict were distinguishing features of human evolutionary history and that the necessary and sufficient function of political communities is defense, or the protection of their members from hostile groups of humans.

In order to test this theory I gathered data on the characteristics of political communities from a worldwide sample of societies. My sample contained 60 societies. These societies were selected randomly from the summary version of the Ethnographic Atlas, (Murdock, 1967), which contains a listing of 863 societies from every inhabited region of the world.[1] The summary version of the Ethnographic Atlas at the time of its construction contained virtually all of the societies in the world for which adequate ethnographic descriptions existed in the English, French, or German languages (the major languages of ethnographic research).

There are a number of advantages in using the summary version of the Ethnographic Atlas in studying historical political change. One advantage is that the Ethnographic Atlas includes societies of every degree of sociopolitical complexity. It includes hunter-gatherer societies as well as modern states. Included in my sample, for example, are the Chichimeca, a hunter-gatherer society, and Iran, a modern state. The diversity of societies within the Ethnographic Atlas allows the researcher to test hypotheses about political communities that are broad in scope.

---

[1] Appendix C explains in greater detail the methods of sampling which I used.

Another advantage is that the Ethnographic Atlas includes socie-
ties from every inhabited region of the world. This lessens the
chance that the characteristics of any sample of political communities
are largely due to cultural diffusion. A modern example of cultural.
diffusion is the similarity that exists in the characteristics of the
political communities of the countries of Eastern Europe. It would
be a mistake to generalize about political communities based only
upon a study of these countries.

There are several problems in using the Ethnographic Atlas to
study political change for which there are no entirely satisfactory
solutions. One problem is that the Ethnographic Atlas is a sampling
universe of societies, and not political communities. For this
reason, any generalizations about political communities are in fact
generalizations about the political communities of a sample of
societies. This is not as large a problem as it might seem because
most ethnographic studies of societies look at only a single or a
few political communities. For those societies in which there were
adequate ethnographic accounts of several political communities, I
selected one of the political communities at random.

Another problem with using the Ethnographic Atlas is the ques-
tion of weighting. Should greater weight be given to those societies
which have a large number of political communities than to those
with only one or a few? Or, alternatively, should greater weight
be given to societies with large populations or with large political
communities? The advantage of using weights based on the number of
political communities within a society is that calculations would
be "based" on the political community as the unit of analysis. For

several reasons I did not feel that weighting in this way was appropriate. First, information was sometimes lacking on the number of political communities in a society. Second, the accounts of societies contained in the Ethnographic Atlas are not from a single point in time but from different periods in history. The use of weighting, therefore, would not result in a cross-sectional design with the political community as the unit of analysis.

It should be noted that ideal research designs to study political change are simply infeasible because of data limitations. A researcher who would use a longitudinal design and study a sample of political communities over time will only be able to look at a very few well-studied and possibly unrepresentative societies. The use of a longitudinal design is possible only if there are adequate data on a representative sample of societies over time. Only modern societies can be studied in this fashion.

The use of a longitudinal cross-sectional design in which different samples of political communities are studied at different historical intervals is simply infeasible because adequate data do not exist for such a study in any region of the world.

The data that I coded from the ethnographic accounts are for specific focal periods and thus are not sufficient for a true longitudinal design. For many societies there was no significant change in the characteristics of political communities during the focal period. In some of the societies, however, there was significant change. My strategy was to code for the most complex structural characteristics observed during the focal periods. I did this because of my hypothesis that the structural characteristics

of political communites are dependent variables and a consequence of intergroup competition and conflict. If significant political change occurred during the focal period, I wanted to record this change.

I designed a coding instrument to measure variables that were relevant to the major hypotheses that I planned on testing. There were four sections to this instrument.

The first section, the longest, was designed to record basic information on the characteristics of the political communities of the sample societies. Most of the items in this section dealt with sovereignty and warfare. Some of the items dealt with societal characteristics. Additional items dealt with the economic, political, and social effects of modern contact.

Some of the items in the first section that pertained to warfare were borrowed directly from an earlier cross-cultural study of warfare by Keith Otterbein (1970). Some of the items that pertained to the characteristics of political communities were adaptations of items from a cross-cultural study by Tuden and Marshall (1972). The inclusion in my study of the same or similar items from prior studies allows a check for potential sampling errors and/or differences in coding criteria. The problems of validity with my own study and with cross-cultural studies in general are discussed in greater detail in Appendix C.

The second section was designed to record basic information on political officials. It dealt with the activities of political officials, methods of recruitment into political office, and the perquisites associated with office.

The third section was designed to record basic information on

the nature of the relationship between each of the sample societies
and other societies with which it interacted (e.g., friendly, hostile).
This information was not as good as I had hoped, but I decided to re-
cord whatever information did exist because of its importance to my
study.

The fourth section was designed to record basic information on
disputes and methods of resolving disputes within the sample societies.
My objective in doing this was to study the nature of cor .tition
between individuals, kin groups, and groups and its consequences for
political communities.

The sources of data on the sample societies included ethnographic
accounts by anthropologists, ethnologists, missionaries, explorers,
travelers, and others who had direct contact with the society (see
Appendix B). For some of the sample societies, however, the only
information that was available was from historical accounts.

These sources of data were identified from bibliographic list-
ings in the Ethnographic Atlas, from listings in the Human Relations
Area Files (for those sample societies in the HRAF), from search of
the card catalogue at the University of Michigan library, and from
prior cross-cultural studies. Materials were acquired at the
University of Michigan library, at the Human Relations Area Files
(located within the library), and through other libraries through
inter-library loan. A preliminary search was made of these materials
by either myself or one of my assistants to determine the relevance
of the information contained within them to my study. For several
societies (e.g., the Banyun, Sara) there was very little information
that was relevant to my study. No society was deleted from the study

because of this, however, since doing so would result in potential bias. Instead, lack of information was recorded as missing data. The overall adequacy of information on different items varied substantially. In general, however, information was adequate on items that were most important to the testing of my major hypotheses. The societal data were coded by myself (40 societies) or jointly with the help of one or more of my assistants (20 societies).

Chapters

The focus of this study is upon the characteristics of political communities. The most important of these characteristics is sovereignty which I define as "final authority on a matter of public importance." Specifically, I look at the incidence and distribution of sovereignty within political communities and try to explain these things in terms of competition and conflict for reproductive resources at two levels: between groups (or political communities), and within groups.

In Chapter 2 I discuss processes of biological evolution and the relevance of warfare to these processes. Warfare is the most important mode of competition and conflict between political communities. I argue that it has had many direct and indirect effects upon human survival and reproduction. It has been important in the evolution of many traits that are unique or distinctively expressed in humans.

In Chapter 3 I look at culture. I argue that the capacity for culture enables humans to respond opportunistically to the environment in ways that enhance inclusive fitness. In this sense, culture is linked with competition, both between and within groups. Many cultural traits owe their existence and expression to warfare and its

effects upon societies.

In Chapter 4 I look at the origins and causes of warfare between human groups. I point out that there is little evidence regarding the origin of warfare, but that some explanations are more plausible than others. In particular, those explanations that are consistent with observations about the causes of warfare in hunter-gatherer societies are more plausible than others. Two of these causes seem especially likely—food shortages and their causes (e.g., population growth) and shortages of women. The causes of warfare have become more varied and complex over time. These changes in the nature of warfare are largely responsible for the appearance and spread of complex political communities.

In Chapter 5 I look at the incidence of different military practices within political communities and their relative effectiveness. Military practices are important because of their linkage to warfare and the survival of political communities. The use of sophisticated military practices is a distinguishing characteristic of complex political communities.

In Chapter 6 I test my major hypothesis that the single function of political communities is protection of their members from the attacks of hostile groups of humans. In order to test this hypothesis, I look at the incidence and distribution of sovereignty within the political communities of the sample societies. With regard to sovereignty, I look at two characteristics: centralization and polarity.

Centralization is a measure of the complexity of political communities. It includes two components: the number of territorial

or subdivisional levels that exist and the degree of concentration of sovereignty at the highest level. Polarity is a measure of the extent to which sovereignty is held by a single individual and/or group. I argue that both of these characteristics are in large part the consequence of the problems that political communities confront in defending their members from the attacks of hostile political communities.

In Chapter 7 I look at the consequences for political communities of competition between individuals, kin groups, and groups. Life within political communities leads to intensified competition for resources that enhance survival and reproduction. The major political consequences of this include the extension of sovereignty into additional activities, the growth of kinship based coalitions, the appearance of social stratification, intensified competition for political offices, and the fissioning (splitting up) of political communities.

In Chapter 8 I look at the question of whether political elites have used their positions of power in ways that have had the effect of enhancing their own inclusive fitness. If evolutionary theory is true, political elites should have used their positions for reproductice advantage and have promoted political changes that enabled them to do this.

In Chapter 9, the conclusion, I argue that evolutionary theory cannot now be rejected as a framework in which to understand the origin, history, and characteristics of political communities. I point out that this theory will lead us to ask different questions about politics than before and to use different methods of research to answer these questions.

CHAPTER 2

WARFARE AND PROCESSES OF BIOLOGICAL EVOLUTION

In this chapter I present an overview of the processes of biolog-
ical evolution. These processes are responsible for the traits of

all living things including humans. The traits of humans unlike

other living things are both cultural and non-cultural. It is the

non-cultural traits, however, that enable the cultural ones includ-

ing politics. An evolutionary explanation of non-cultural traits,

therefore, is an important step in understanding politics.

As I indicated in Chapter 1, a number of evolutionary biologists

think that many non-cultural traits which are unique or distinctively

expressed in humans exist because of the prominence of warfare in

human evolutionary history. If they are correct, the practice of war-

fare must have had effects upon individual survival and reproduction

(inclusive fitness) that were substantial enough to produce direction-

al changes in traits. As an introduction to this topic, the section

below identifies the evolutionary processes and their general signif-

icance to directional changes in traits. A subsequent section looks

at the linkages of warfare to these processes and its impact upon

the traits of humans, including the significance of this for poli-

tics.

Evolutionary Processes

The modern theory of evolution adds findings from the sciences of genetics and population biology to the discovery by Darwin and Wallace that natural selection is the principal cause of directional changes in the traits of living things. It postulates that the traits of living things in every environment, both past and present, are due solely to the action and interaction of the following five processes: inheritance, mutation, selection, isolation, and drift (see Mayr, 1963; Simpson, 1967). If this theory is true, the traits of humans like the traits of other living things must also be due to these five processes. Otherwise, the theory would be false.

Inheritance.

The process of inheritance is the transmission from parent to offspring of genetic materials. In humans the genetic materials include 46 chromosomes consisting of 22 homologous pairs, called the autosomes, plus the two sex chromosomes. A normal child receives half of its chromosomes from each parent--one chromosome from each of the 22 homologous pairs and one sex chromosome (X or Y). A normal boy receives one of the mother's two X chromosomes and the father's Y.

The significance of the process of inheritance for evolution is that the effects of natural selection upon the traits of living things are able to accumulate from generation to generation. This is possible because genetic materials are particulate and are transmitted from parent to offspring in forms that are generally unchanged. This would be impossible if genetic materials were not particulate. In this case sexual reproduction would result in the blending of the

genetic materials of the parents. The traits of offspring would be a blending of the traits of parents. The effects of natural selection upon traits would not accumulate.

An example of inheritance in humans is the trait of eye color. In the simple text book model, eye color is determined by a single gene with two alleles. The brown allele (B) is dominant, the blue allele (b) recessive. A child who inherits a brown allele (B) from either parent will have brown eyes. A child who inherits a blue allele (b) from both parents will have blue eyes. Since inheritance is particulate, parents who both have genotype Bb can have a blue eyed child. This would be impossible if inheritance resulted in the blending of genetic materials.

Mutation.

Mutations are the changes that occur from time to time to the chemical structure of genetic materials. The smallest of these, called point mutations, involve substitutions of one nucleotide pair for another in DNA. Larger changes, called chromosome aberrations, involve major structural changes to DNA, such as increases in haploid chromosome number, deletions, duplications, inversions, and translocations (see Wilson & Bossert, 1971:22-32). Mutations are caused by various types of radiation and chemicals.

The significance of mutations in evolution is that they are a constant source of changes in genetic materials and are potentially heritable if they occur to the sex cells. Thus, the process of mutation insures the appearance of new types of genetic materials and their possible transmission to subsequent generations.

An example in humans of mutations are the changes to skin cells that result from prolonged exposure to ultra-violet radiation. These changes, although sometimes cancerous, are not heritable.

Natural Selection.

The process of natural selection is the differential replication of genetic materials. It is caused, as indicated in Chapter 1, by the action of various hostile environmental forces. Among these forces are climate, parasites, predators, diseases, food shortages, and mate shortages. Some individuals are better able than others because of their traits to reproduce. The genetic materials of these individuals increase in frequency in the population.

Traits are the consequence of very complicated developmental processes. The genetic materials are organized into strands of DNA called chromosomes that are potentially disassociable and which act as a template for the synthesis of chemicals called messenger RNA (a process called transcription). The messenger RNA, in turn, acts as a template for the synthesis of proteins (a process called translation). Proteins are the basic building blocks of traits.

The totality of an organism's traits is its phenotype. It is the product of the interaction of its genotype (the assembly of genetic materials) with developmental environments. It includes all aspects of morphology, physiology, and behavior. It is useful to think of the phenotype as a bundle of traits that exists because it functions to insulate the genetic materials from the action of hostile environmental forces. The genetic materials that have persisted throughout evolutionary history are those that were (or became) most effectively packaged and insulated from hostile environmental forces (i.e., in a

phenotype) in ways that enhanced their replication.

The significance of natural selection in evolution is that it results in changes in traits that are directional rather than random. Traits that enhance reproduction will increase in frequency in relation to those which do not or do so to less of an extent. A trait that is functional in this sense is an "adaptation." It is a consequence of natural selection and in typical environments enhances individual reproduction. None of the other evolutionary processes result in directional changes in traits that regularly enhance the ability of living things to confront hostile environmental forces.

An example of natural selection is the variation which exists between different human populations in skin color. It is thought that this variation arose in response to differences in the selective pressure of solar radiation. The tendency for hostile forces to persist through time and space is important for evolution because it enables natural selection to produce directional changes in traits.

Isolation.

The process of isolation is an event or sequence of events that results in the separation of genetic materials. The most common cause of isolation is a geographical barrier such as a desert, ocean, mountain range, or river. These barriers prevent individuals of different populations of the same species from interbreeding and producing fertile hybrids. In some instances populations are separated long enough for genetic differences to emerge that are large enough to prevent interbreeding so that speciation occurs (the emergence of a new species from an older parental stock).

Another cause of speciation, although much less common, is temporal separation. A difference in the timing of a life cycle event, which prevents individuals from mating, may also lead to the emergence of genetic differences that are large enough to prevent interbreeding.

As an example of isolation, I would note the different frequencies of blood group alleles between racial groups. This indicates that populations of humans were isolated to some extent during evolutionary history and subject to different selective pressures from parasites and diseases. The fact that most of the alleles are found in all of the racial groups, however, is evidence that this isolation occurred fairly recently and was not complete. Obviously, whatever isolation did exist was not long or sharp enough to prevent hybridization. The significance of isolation as an evolutionary process is that it can lead to speciation.

Drift.

The process of drift is a change in the frequency of genetic materials that is due to the effects of random events. An important example of such a random event occurs in sexually reproducing species when gametes are formed in a process called meiosis. During this process homologous chromosomes pair up and then separate from each other, appearing randomly in one or the other of two daughter cells. After this "reduction division," the daughter cells fission to form gametes with each gamete containing a strand of the randomly appearing chromosome from each homologous pair. The chromosomal material that appears in offspring, therefore, is a random selection of the parental material. In the overall population the process of meiosis results

in changes in the frequency of genes from generation to generation that follow the statistical laws that pertain to random events.

Another possibly random event is migration. The founders of a new population may be small in number and possess only a portion of the genetic materials of the parent population. In some instances chance may be a factor in determining who is or is not a founder. An example, perhaps, is the migration that occurred across the land bridge to North America about 10,000 years ago. The genetic materials of those who migrated probably differed for random reasons from those who stayed behind in Asia.

The process of drift generally has a large impact only upon the gene frequencies of small populations. In large populations the effects of random events tend to cancel each other out due to the laws of probability.

Many scientists think that drift was significant during the period when humans lived in small hunter-gatherer groups. Some scientists also think that drift was responsible for the large amount of genetic polymorphism that exists in the populations of many species. They attribute this to the fixation by drift of selectively neutral genes.

Of these five processes, natural selection is by far the most important in producing the sorts of directional changes in the traits of living things that are adaptations, or traits that enable living things to reproduce in the face of hostile environmental forces. The changes in traits that are due to drift, by definition, are not directional. Neither are the changes in traits due to mutations. This is because the action of chemicals and radiation upon genetic materials

occurs without regard for its potential consequences for survival and reproduction. The structural changes that these actions induce, or the mutations, are generally harmful. Two observations support this view. Rates of mutation are ordinarily quite low (Strickberger, 1976: 539-542) suggesting natural selection against mutation. Mechanisms also exist that repair damage to genetic materials caused by mutations (Strickberger, 1976:568-570).

Warfare and Evolutionary Processes

Warfare, which involves the use of weapons, is a cultural trait. Its function is presumably the same as any other cultural trait—it helps insulate individuals from the action of hostile environmental forces. A cultural trait that does this enhances the fitnesses of the individuals who construct, use, maintain, and transmit it.

The military practices associated with warfare (e.g., weapons, tactics, and the characteristics of military units) vary in their effectiveness as gauged by the relative strategic success (i.e., gains/losses in territory/autonomy) of the political communities which use them. This would be of evolutionary significance if the strategic success of political communities was positively correlated with the relative fitness of their members, and especially, those members who are connected with military practices. The genetic materials of these individuals would increase in frequency in the population.

It is reasonable to hypothesize that natural selection as a direct or indirect consequence of war has resulted in directional changes in non-cultural human traits. These changes were presumably in directions that facilitated the use of effective military

practices. Thus, it is arguable that the relationship between war and human traits was reciprocal. The appearance of an effective military practice favored the spread of non-cultural traits facilitating its use. The spread of a non-cultural trait facilitated the use of particular military practice(s).

The nature of these relationships would depend upon warfare and its linkages to the two evolutionary processes that result in directional changes in traits--natural selection and migration.

Warfare and Natural Selection.

The major effects of warfare upon the traits of humans must have occurred during the 99 percent of cultural history when humans lived in small hunter-gatherer groups. These effects are difficult to study directly because of the limited physical evidence available from this period, which consists mostly of skeletal material and tools. Although the evidence is limited, it does indicate intra-specific killing with weapons during the Pleistocene (Roper, 1969). The causes, context, and scope of such killing, however, are ambiguous, as are its consequences for the evolution of particular human traits.

Another approach is to infer these effects indirectly by looking at data on warfare in historical and contemporary hunter-gatherer societies. The assumption is that warfare in these societies resembles that which occurred in prehistory.

The literature on primitive war is extensive (see Divale, 1971, for bibliography). It suggests that war in prehistory involved small political communities, with memberships of 75 or less, that were located fairly close to each other. Wars occurred frequently, perhaps once every several years or more often, but were brief, lasting

less than a week. Warriors used projectile weapons, such as throwing

spears and bows and arrows. In some instances they used shock weapons,

such as clubs and knives, in situations where surprise was possible.

Tactics were limited to rushes and ambushes in which surprise was the

critical element. Warfare of this type would presumably have a variety

of effects, both direct and indirect, upon directional changes in

traits.

Direct Effects. The direct effects of warfare upon traits

are those attributable to combat casualties. Those who are killed in

military actions, including both combatants and non-combatants, suffer

an immediate loss in inclusive fitness. Their genes (and heritable

traits) decline in frequency in the population. The genes (and herita-

ble traits) of those who survive military actions, on the other hand,

increase in frequency.

The overall impact of these effects upon traits would depend

upon a number of things. First, and most important, is the nature

of casualties. Who was killed? Who survived? For directional changes

in traits to occur, those who are killed must differ in some respects

in their traits from those who survive. Second, is the genetic varia-

bility which exists. According to the Fundamental Theorem of Natural

Selection, the rate of evolution is proportional to the amount of

genetic variability. If there is little variability, the rate of

evolution is necessarily slow regardless of the intensity of selec-

tion; if there is much variability, the rate is possibly much faster.

Third, is the heritability of the traits. This is important because

natural selection acts on phenotypes and not genotypes. If genetic

variability is not expressed or is expressed randomly natural

selection does not result in directional changes in traits. Fourth, is the rate of casualties in war. If this rate is low, directional changes in traits also will be slow. Since very little is known about any of these things, it is difficult or impossible to systematically assess the direct effects of warfare in prehistory upon traits.

The situation, fortunately, is not entirely hopeless. It is possible to make some inferences about who was killed and who survived the wars of prehistory by looking at war in hunter-gatherer societies and also by looking at our own traits since we are the descendants of the survivors of such wars. It is also possible to assume based upon the experience of centuries of selective breeding of domesticated animals that sufficient genetic variability existed for evolution to occur at a "reasonably" rapid rate. It is also almost certain that some proportion of this genetic variability was heritable since the effect of natural selection is to save genes (and combinations of genes) that express themselves reliably (i.e., produce heritable phenotypes). Finally, it is possible to infer the rate of casualties in the wars of prehistory by using historical data on casualties in wars fought by simple political communities before they were subjugated.

The data that I collected on warfare, unfortunately, is not that useful in gauging the impact of the direct effects of warfare during prehistory on human traits. Accordingly, my discussion of these effects is largely inferential and speculative.

The limited data that I did collect pertain to casualties. It is unlikely that warfare in prehistory would have been an especially potent cause of natural selection if casualties were insignificant.

My measure of casualties was the highest number of combatants killed or wounded in any military action. "Friendly casualties" are those of the sample society. "Enemy casualties" are those of its enemies. The data pertain to offensive warfare since there was little information on casualties in defensive war. My variable for casualties included three levels: low (0-2 combatants killed or wounded), moderate (more than 2 but less than 1/3), and high (more than 1/3). It should be noted that information on casualties is notoriously unreliable. Nevertheless, for my purposes, totally accurate information is not that important because of the imprecision of my measure.

The evidence on primitive war suggests, as indicated above, that warfare in prehistory was unsophisticated. Casualties from single battles were probably low to moderate. The changes in gene frequencies that resulted from such casualties were small.

If this were true, casualties in the simple political communities of my sample, which most nearly resemble those believed to be characteristic of prehistory, should also be low to moderate. To test this hypothesis, I divided political communities into two groups: simple political communities with only one or two territorial or subdivisional levels (generally equivalent to hunter-gatherer bands and tribes) and complex ones with three or four territorial levels (generally equivalent to chiefdoms and states). I discuss this indicator and its measurement in detail in Chapter 6.

Tables 2.1 and 2.2 show the relationships that existed between the complexity of political communities and friendly and enemy casualties, respectively. It is apparent that casualties were generally low to moderate in simple political communities, consistent with my

Table 2.1: Casualties in Warfare (Friendly)

	Casualties		
Complexity of Political Communities	Low (0-2)	Moderate (3 to 1/3)[a]	High (more than 1/3)
Low	4	5	3
High	3	5	3

N= 23   phi= .07
               p > .10

Table 2.2: Casualties in Warfare (Enemy)

	Casualties		
Complexity of Political Communities	Low (0-2)	Moderate (3 to 1/3)[b]	High (more than 1/3)
Low	4	8	1
High	1	5	5

N= 28   phi= .21
               p > .10

[a] 3 to 1/3 of attacking combatants (sample society)

[b] 3 to 1/3 of defending combatants (enemy society)

expectation. However, the incidence of high casualties was somewhat greater than I expected. This may be due to the acquisition by some of the simple political communities of my sample of sophisticated military practices, such as rifles, by diffusion from complex political communities. Thus, casualties in the simple political communities of my sample probably overestimate those which occurred in their predecessors of prehistory.

Although combat casualties in prehistory were most likely low to moderate, their cumulative effects over a long period of time would possibly have substantial demographic consequences. Studies of casualties in primitive warfare suggest that overall mortality due to warfare is actually much higher in simple than in complex political communities (Livingstone, 1968). There are probably several reasons for this. In simple political communities, warriors are a larger proportion of the total population. The frequency of war is also somewhat higher. Also, as Tables 2.1 and 2.2 suggest, casualties in complex political communities, despite the use of sophisticated military practices, may not be always that much greater.

Although there is little direct evidence on the proportion of each generation of <u>men</u> that is killed in warfare in simple political communities, an estimate of 15 to 20 percent would not be too far wrong.

Consider the following example. Assume a political community in which every able bodied man is available for military duty between the ages of 16 and 25, or for 10 years. A war breaks out on average every 2 years. There is an average of one friendly death per war. The average size of military units in wars taking into account alliances is about 30. Under these assumptions, the average warrior

would stand about a 17 percent chance of dying in a war during his 10 years of availability for military duty. Mortality per generation of this magnitude is sufficiently large to encompass very rapid rates of evolution in the small populations characteristic of prehistory.

The following is a simple, hypothetical example. Imagine a population of 1,000 hunter-gatherers comprised of 20 groups of size 50. One quarter of this population or 250 are adult men. About 20 percent of these or 50 are killed in combat during their lifetimes. Imagine that the initial frequency of genotypes in this population is as follows: AA (30 percent), Aa (40 percent), and aa (30 percent). In the population, therefore, the frequency of the A allele is .5, as is the frequency of the a allele. Suppose that the AA genotype is the fittest. For example, it might have the phenotypic effect of greater agility, enhancing a warrior's ability to avoid enemy missiles. Of the 250 adult men, 75 have genotype AA, 100 genotype Aa, and 75 genotype aa. If deaths in combat were random with respect to genotype (i.e., no natural selection), 15 of those killed should have genotype AA, 20 genotype Aa, and 15 genotype aa. Suppose, however, that only 10 of those killed had genotype AA, 20 genotype Aa, but 20 genotype aa. In other words, 13 percent of men with AA were killed in combat, 20 percent with Aa, and 27 percent with aa. These 50 deaths would result in an increase in the frequency of genotype AA in the population to 30.5 percent, and a decline in aa to 29.5 percent. The frequency of the A allele in the population would increase by .5 percent in a single generation due to combat casualties alone. Since the men who were killed in combat would likely leave fewer descendants, the effects of combat casualties upon gene frequencies

would be further augmented. It is plain, as this example shows, that moderate differences in the relative fitness of genotypes in combat can result in rapid evolution. Although a .5 percent change per generation may seem small, it is not small if directional selection continues for 10, 20, 30, or 40 generations, a short time span in human evolutionary history.

The analysis of the direct effects of warfare in prehistory upon human traits, as I pointed out above, depends largely on inferential evidence, precluding a systematic approach. The issues involved, however, should be absolutely central to our understanding of the traits of humans, including political behavior.

My objective below is to suggest some non-cultural traits that are plausibly the consequence of combat casualties. My arguments are not especially novel since they build on previously published arguments. Many of these arguments, however, are very general and do not look specifically at how combat casualties resulted in selection of particular traits.

The major evolutionary consequences of combat casualties in warfare is so obvious that it is often overlooked. In terms of inclusive fitness, the advantages of surviving combat are substantial, the advantages of killing the enemy much less (except when in close contact, such as hand-to-hand combat, when it is a question of kill or be killed). This has important implications for the evolution of human traits and is the main theme of my discussion below which points out the linkages of specific traits to survival in combat.

(1) Sexual Dimorphism. This term refers to differences in traits between the sexes. In some species, such as many birds,

males and females are quite similar in size, coloring, and behavior. In other species, however, such as many primates, males and females look quite different.

The major cause of sexual dimorphism is selection in the context of competition for mates. Selection occurs for traits that contribute to success in such competition. The amount of sexual dimorphism in a species is positively correlated with the deviation of its breeding system from monogamy (Alexander et al., 1979). In polygynous species competition for mates is most intense among males, and reproductive success varies more among males than among females. In polyandrous species, the reverse is true. Typically, differences in traits between the sexes are visible because of the traits of the sex in which competition is most intense. In polygynous species it is typically the male that is the largest, brightest colored, and possesses the most marked secondary sex characteristics. In polyandrous species the reverse is typically true.

Although breeding systems in contemporary and historically observed societies vary greatly (see Chapter 8), the evidence suggests that Homo sapiens was moderately polygynous for most if not all of its evolutionary history. Most of the primates, including the chimpanzee, are polygynous. Also, most hunter-gatherer societies are moderately polygynous (i.e., a few men in each group have multiple wives). If this is true, competition for mates in Homo sapiens was most intense among males, and not females.

An important context of such competition is warfare. A common reason for war in simple political communities is women. The warriors of one political community attacked another to capture their

women (see Chapter 4). An obvious fact about warfare is that men participate in armed combat, and women almost never do. The casualties of combat are principally men and not women. Selection in the context of combat, because of this, is presumably a potent cause of sexual dimorphism.

An extended discussion of the physical differences between men and women and the extent to which these are attributable to genes on the sex chromosomes, or to environmental influences, or to both is unnecessary at this point. It is sufficient to point out that there are obvious phenotypic differences between men and women and that some of these are due in part to the presence of genes on one or more of the sex chromosomes.

It is also likely that some of these differences are attributable to selection in the context of warfare. In almost all societies men are judged to possess traits such as strength in the upper arms, a natural throwing motion, a comparatively high tolerance of pain, and large size that make them fit for combat. Women, on the other hand, are judged to lack these traits. In most societies women are excluded from combat units and at most accompany warriors in a supporting role as cooks and porters.

The predominant role of men in combat is a plausible explanation for the almost total absence of women from the highest executive offices of political communities (see Putnam, 1976:32-33). These offices are almost always linked with military activities, and especially, with defense. Since women generally do not have military experience they usually lack the sort of credentials that are considered advantageous for recruitment to these offices. For example, all

of the U.S. Presidents have been men and all but a few have served in the military. Many that did serve in the military were high ranking officers with combat experience.

(2) Male Neoteny. This term is used in developmental biology to refer to the tendency for juvenile traits to persist into adulthood. Male neoteny occurs in all polygynous species. In the gorilla, for example, it is the older silver-backed male who typically dominates the younger black-backed males and obtains preferential access to females. In chimpanzees younger males typically wait for their size, strength, and experience to increase before they challenge older, dominant males.

Among polygynous species humans are distinctive in the extent to which competition for mates occurs in the context of intergroup competition. Male neoteny in humans, therefore, may be due (in part) to the advantage of delaying participation in military actions. In this regard, it is interesting that many societies have rituals that arbitrarily designate young males of particular ages as adults.

Age-graded patterns of social dominance in humans are also well entrenched. The large majority of political communities of the world are dominated by old (and sometimes very old) men. A distinctive feature of these age-graded patterns in humans is that they depend to much less of an extent than in other species upon fighting abilities. More often they depend upon the disproportionate control by older men of political resources accumulated over the course of a lifetime and their greater experience in using these resources to maintain and enhance their own position. The older men who are able to do this, of course, are also a select group of survivors among

a larger group of their cohort who attempted this, but failed.

The pervasiveness of age-graded dominance hierarchies in societies is a significant disadvantage to young men. Nearly all political communities require that young men and not older and more powerful men serve in military units. In many societies the positions of older men are protected by seniority and tenure rules. Older men have also established rules that base compensation and benefits on service and age rather than on productivity.

(3) Disabilities. The intensity of selection against some disabilities may be diminished because they make individuals unfit for combat, increasing their chances of survival: psychological conditions such as paranoia, sexual disorders like homosexuality, and physical handicaps like arthritis and obesity. All of these (except, perhaps, homosexuality) would presumably be disadvantageous in combat. It is interesting to note that not all societies acknowledge or tolerate these disabilities so that there is great variability in their incidence and cultural significance.

(4) Fear. The ability to recognize the risks of combat, to be afraid of them, and to avoid them would presumably enhance survival. The function of fear is to mobilize the individual's sensory and motor capabilities and enable the use of these for either flight or fight.

In combat, fear is elicited by stimuli that are novel and known to be dangerous such as the shouts of enemy warriors, the noise of cavalry, the explosion of missiles, the screams of wounded warriors, and the sight of blood. This fear is accompanied by physiological changes, such as the release of epinephrine, that prepare the individual

for meeting danger or escaping from it.

Fear is an evolutionarily conservative trait. It is linked with the endocrine systems that regulate aggressive behaviors in most if not all vertebrates. Its original function was presumably the avoidance of predation. In many group living vertebrates it has taken on a secondary function in connection with competition for food, mates, and other resources.

The specific features of the endocrine system of humans are presumably to some unknown extent due to selection in combat. For example, if warfare in prehistory was a cause of prolonged stress, hormones that are released in response to prolonged stress, such as norepinephrine, should be more prominent in the endocrine system of humans than in other species that do not confront prolonged stress.

It is interesting that many societies have adopted methods to diminish and redirect the fears of warriors. Some of these are functional because they reduce the danger to warriors of military actions. The provision of armor and training in the use of projectile weapons (which are safer because they are hurled or fired from a distance) reduce the fears of warriors. Physical training increases the confidence of warriors in their own agility and strength. Practice in tactical maneuvers demonstrates the value of coordinated military actions.

Other methods are less functional because they do not greatly reduce the danger of military actions. Some societies require warriors to observe special taboos such as not eating meat or not having sexual relations. Some societies hold war dances or consult sorcerers to divine the future or to put a curse on the enemy. In some societies warriors use drugs. The high incidence of these practices suggests the

great fear that men have of trying to kill the enemy in armed combat.

A significant development in weapons is the improvement of relatively safe projectile weapons. Although these are less effective than shock weapons (see Chapter 5), they are easier to use since warriors do not need to overcome the fear of closing with the enemy and engaging him, if necessary, in hand-to-hand combat. This inhibition to attack is lacking with modern weapons such as artillery, ballastic missiles, bombers, fighter planes, and rifles which are used at a distance.

The incidence of warfare is undoubtedly higher today than it would be otherwise because of the existence of such weaponry. Another factor that leads to a higher incidence of war is the ability of those who authorize military attacks to insulate themselves and their families from the consequences of such attacks. For example, the personal safety of Margaret Thatcher and General Galtieri were not threatened in the slightest by war in the Falklands.

(5) Courage: I would define this trait as the capacity to disregard the dangers to life and limb of armed combat. This capacity is what enables warriors to close with the enemy, to engage him, if necessary, in hand-to-hand combat, and to subdue him.

It is reasonable to suppose that courage, because of the minimal advantage to inclusive fitness of killing the enemy, is not especially widespread. In his study of primitive war, Turney-High (1949) lamented the seemingly exaggerated concern of warriors with saving their own "hides" and the extent to which they relied upon cumbersome armor to protect themselves rather than courage in the attack.

The advantage of courage to warriors is not readily transparent if those with the trait (or more of it) are more likely to be killed

in combat. The evolutionary biologist R.A. Fisher (1958:181) argued that courage was attributable to "the advantage which it confers, by repute and prestige, upon the kindred of the hero." An alternative (or perhaps supplementary?) explanation, however, is that courage is due to stabilizing selection in which adverse selection acts at the extremes of phenotypic variance. The extremely courageous warrior is more likely to be wounded or killed in combat because he needlessly exposes himself to danger. The extremely uncourageous warrior is also more likely to be wounded or killed because of his reluctance to engage the enemy at the opportune time.

It is important to distinguish courage, as I have defined it, from the "courage" that is displayed by warriors in extreme life threatening situations when the failure to take action will cost them their lives. In a situation such as occurs in hand-to-hand combat, when surrender is precluded, selection should obviously favor the mobilization of every system that would aid survival. This is not really courage but rather the attack response that is induced by fear.

In most (but not all) societies people look upon courage as a desirable trait and reward those who display it in combat. In the U.S. Army, for example, the highest military honors, such as the silver star, generally go to those who have displayed extraordinary ability and courage in combat. Some methods of political recruitment allow consideration of the qualifications of potential successors. Those who have displayed courage in combat enjoy an advantage over those who have not (e.g., Andrew Jackson, Ulysses Grant, Theodore Roosevelt, Harry Truman, John Kennedy).

(6) Foresight (Intelligence). Foresight is the ability to visualize alternative actions and their consequences. This trait more than any other distinguishes intergroup conflict in humans from that which exists in other species. Warriors are able to build scenarios, run through them to see if they will work, and implement them. This sort of planning seems to be lacking in intergroup conflict in other species such as baboons, chimpanzees, hyenas, and ants. In these species intergroup conflict seems to occur in response to immediate contingencies (or current stimuli) such as discovery of the intrusion of an alien individual or group.

The ability to visualize alternative actions and their consequences is important in battle because it enables warriors to avoid unnecessary risks. Many deaths in battle are attributable to "foolish" mistakes. There are many examples. There is the warrior who reveals his position by moving, talking loudly, smoking, or building a fire. There is the warrior who for one reason or another breaks formation to attack the enemy. There is the warrior whose weapons fail him because they are not properly maintained. There is the warrior who does not take appropriate defensive measures, such as falling asleep while on guard duty, or not digging in.

Foresight is related to a trait that for lack of more precise terminology has often been called "intelligence." The potential importance of warfare in the evolution of human intelligence occurred to Darwin over a century ago as is indicated in the following passage from The Descent of Man which was recently quoted by E.O. Wilson (1975:573).

Now if some one man in a tribe, more sagacious than the oth-
ers, invented a new snare weapon, or other means of attack
or defence, the plainest self-interest, without the assis-
tance of much reasoning power, would prompt the other members
to imitate him, and all would thus profit. The habitual prac-
tice of each new art must likewise in some slight degree
strengthen the intellect. If the invention were an important
one, the tribe would increase in number, spread, and supplant
other tribes. In a tribe thus rendered more numerous there
would always be a rather greater chance of the birth of other
superior and inventive members. If such men left children
to inherit their mental superiority the chance of the birth
of still more ingenious members would be somewhat better,
and in a very small tribe decidedly better. Even if they
left no children, the tribe would still include their blood-
relations, and it has been ascertained by agriculturists that
by preserving and breeding from the family of an animal, which
when slaughtered was found to be valuable, the desired charac-
ter has been obtained.

Although Darwin was mistaken to think that non-cultural traits

acquired by a parent during his lifetime could be transmitted to his

children, this does not diminish his major points. Intelligence is

of potentially great significance in warfare. It is linked with inven-

tiveness in weapons and the ability to recognize and exploit inventive-

ness. It enhances the military effectiveness of a political community

and as a consequence the survival and reproductive capabilities of

its members.

A number of evolutionary biologists have extended Darwin's idea

by examining the hypothesis that the hypertrophy of the human brain

is due to warfare. Alexander and Tinkle (1969) were the first to set

out the idea, pointing out that the human brain is a distinctive charac-

ter that requires a special explanation. They argued that the only

thing unusual about the evolutionary history of humans, in contrast to

that of other species that evolved under similar conditions, was the

prominence of conflict between groups. Alexander (1971) later

elaborated on this argument. Pitt (1978) looked at various alternatives to Alexander and Tinkle's argument and rejected them.

The arguments of these evolutionary biologists about the human brain are provocative but have received little attention. Presumably, much could be learned about the brain if we had a better understanding of its function. This problem should oe a major focus of research in anatomy, neurobiology, and psychology.

The relevance of intelligence (and the symbolic capabilities that go along with it) to politics is difficult to overstate. It makes possible complex forms of communications, and in particular, deception and methods of detecting deception. It makes possible extended reciprocity and the multi-levelled political structures that depend on reciprocity. It makes it possible to form and break apart alliances with flexibility. And, perhaps most importantly, it allows individuals to anticipate future contingencies and respond appropriately to them, an ability that is much less evident in the other primates.

(7) Cooperativeness. This trait is of obvious importance in combat because of its linkage to effective military practices. This is true of defensive activities such as the construction of fortifications, the guarding of villages, and the mobilization of warriors in the event of attack. It is true of offensive activities as in the use of complex tactical formations.

The advantage to an individual of living in a group in which members are able to cooperate in military and other actions to defend the group is transparent and substantial. The individual, his children, and other coresident relatives are better protected against the attacks of hostile groups. So also is his property and that of his

children and other coresident relatives. All of these things are dir-
ectly relevant to his inclusive fitness.

An indication of the importance of this advantage is the emphasis
that people everywhere put on their own physical security and that of
their relatives in times of war. If their own political community is
unable to defend them, and if it is at all possible, they will flee to
another one that can do this. A recent example is the flight of
Cambodians to Thailand. They will also offer support to a political
community that will defend them. A recent example is the support of
Lebanese Christians for the Israeli invasion.

The advantage to an individual of actually cooperating in military
and other actions to defend the group, because of the costs of doing
this, are much less transparent. The individual may expose himself
to the risks of injury and death in combat. He may expend resources
for public purposes, such as taxes, that otherwise would be used for
personal and family advantage.

The advantage of cooperating would seem more likely to exist under
some conditions than others. In a small group, unlike a large one,
the cooperation of everyone capable of engaging in military and
other actions to defend the group may be critical to the success of
such actions. In situations where the costs of engaging in military
and other actions is small, as when combat casualties are low, the
costs to the individual of cooperation are less. In situations where
there are supplemental advantages to participation, such as the pro-
tection of numerous relatives or of substantial property, the benefits
of successful defensive actions are greater. Finally, in situations
where alternative actions, such as concealment and flight, are

precluded, cooperation in defensive action might be the only viable
option.

In the hunter-gatherer groups of prehistory, most if not all of
these conditions prevailed. Military units were small. Casualties,
as I argued above, were probably low to moderate. Groups were com-
prised of individuals who were closely related. There were important
resources, such as land and women, to defend. Finally, actions such
as concealment and flight, when the enemy was armed, would be extremely
risky.

The original function of cooperative group defense in humans
(or their proto-human ancestors) may be linked with the advantages of
deterring scavengers from killed prey and large predators from camp-
sites. This trait seems to be evolutionarily labile and therefore
of recent origin. The trait is variable throughout the primates and
even between different populations of the same species. For example,
chimpanzees in forested regions will scamper into trees at the sight
of a model leopard whereas those in less forested regions will mob,
threaten, and attack.

The lability of this trait in primates is presumably due to dif-
ferences in living, terrain, and predators. Under some conditions,
such as small groups, open terrain, and large predators, cooperation
is an effective antipredator strategy, while under the opposite
conditions, it is not.

Cooperative group defense in the context of intergroup competi-
tion is much less common. It was presumably an extension of the orig-
inal function of cooperation as an antipredator strategy. Once
humans (or proto-humans) were able to cooperate with each other in

deterring scavengers and predators, and did this with weapons, the capability would exist of deterring hostile groups of conspecifics.

The trait of cooperativeness, as I will argue in subsequent chapters, is of paramount importance in understanding the capacity of humans for culture and for that aspect of culture called politics. It is plain that an organized form of intergroup competition such as warfare would be impossible without it. So also would the organized forms of competition within groups that involve coalitions of individuals. Although cooperativeness is a social behavior that exists in many species that are without culture, such as bees and ants, it is nonetheless a necessary condition for much of it.

It is noteworthy that in humans the ability to cooperate in defensive efforts is linked with abilities to cooperate in other contexts. These abilities seem to be effective to the extent that they mimic defensive efforts. A good coach in team sports, such as baseball, basketball, hockey, and football, insures that the members of the team acquire team spirit, obey rules, practice together, and play to win, even if this means individual sacrifices. Similar things might be said of executives in other activities in which team effort is important, such as business and partisan politics.

(8) Non-Cooperativeness. Defensive effort is inhibited by non-cooperativeness, or more simply, selfishness. An individual who does not help in defensive efforts may benefit from them in any case, as a "free rider." While he avoids the costs of these efforts, he still reaps their benefits (i.e., protection). The selfishness of any single individual, however, presumably makes a successful defense

less likely.

In most societies methods exist to insure cooperation in defensive efforts. Some political communities, especially small ones, require that all able-bodied men   be warriors. The penalties for evasion include physical punishment, ridicule, and social ostracism and are so great as to virtually preclude it. Other political communities, especially large ones, use or threaten coercion, as in the military draft.

In modern political communities there are often special constitutional provisions that give the chief executive special powers in times of war. For example, the government of Great Britain was able to requisition civilian ships for use against Argentina in the Falkland Islands war. The existence of such provisions indicates that modern political communities cannot depend upon the full cooperation of their citizens in defensive efforts.

Modern political communities are associated with conditions (e.g., large military units, high combat casualties, the possibility of emigration and evasion of military service) that inhibit cooperativeness. A trait that is as labile as cooperativeness and is dependent upon external contingencies for its expression is likely to involve substantial learning. Individuals are likely to respond to contingencies in an appropriate way. They will cooperate when it is beneficial to do so, as did U.S. citizens in World War II, but won't when the situation is hopeless, as the South Vietnamese failed to do after the United States pulled out its troops.

(9) Revenge. Another trait that is prominent in humans is the desire for revenge for any harm that is due to the deliberate unprovoked military action of other political communities. "Turning

the other cheek" has evidently not been an effective way of coping with hostile conspecifics when these are members of   other   political communities.

In relations between political communities, revenge seems to function as a deterrent. Political communities that would attack others deliberately must expect that their victims will return the favor and retaliate.

The political scientist Robert Axelrod (1981) has recently analyzed the conditions under which cooperation can occur between self-interested individuals. The results of his study are applicable to interactions that resemble the Prisoner's Dilemma situation. The major finding of his study is that "tit-for-tat" is a stable strategy when there is a high probability of future interactions between players. A player that uses tit-for-tat cooperates on the first move but responds exactly as his opponent on subsequent moves -- cooperates if he cooperates, defects if he defects. If there is a low probability of future interactions between players, however, defection may be the most stable strategy.

Relations between political communities, especially simple ones, often resemble this strategy. Attacks are regularly followed by counterattacks in retaliation. Alliances are most often struck between neighboring political communities which have close economic and social ties. Relations between political communities located some distance from each other are typically less amicable and may fluctuate over time depending upon shifts in balances of power. Relations between political communities located far from each other, to the extent that there is any contact at all, are almost always hostile.

Revenge is especially potent when it is due to deliberate and unprovoked military action that results in the deaths of spouses, children, siblings, friends, and countrymen. The potency of revenge in these situations suggests that its expression if not its origin is connected to natural selection in warfare.

(10) Aggressive/Submissive Behaviors. Other traits that are important to the success of military actions are leadership and its counterpart, followership. To be successful, military units must have commanders capable of giving orders and warriors capable of obeying them. Otherwise, battle plans could not be executed, and the members of military units could not act in unison.

Aggressive/submissive behaviors within military units resemble in some respects those that occur in other social contexts. For example, as in families, compliance is obtained by a system of punishments and rewards. In other respects, however, these behaviors are different. In military units, interactions occur between men, not between men and women, and not between adults and children. There is less of an asymmetry of strength between the dominant and subordinate individuals.

Aggressive/submissive behaviors are of ancient origin. They are very widespread, existing in crustaceans, fish, reptiles, birds, rodents, ungulates, and primates. Among primates, they exist in the chimpanzee, a close relative of humans, and also the gorilla, the baboons, and the macaques.

Aggressive behavior is of advantage to dominant individuals because they get preferential access to reproductive resources such as food, nests, and mates. Submissive behavior is of no advantage to

subordinate individuals except that they avoid serious injury and death and enjoy the various benefits of group living, such as protection from predation (Alexander, 1974).

Although widespread, aggressive/submissive behaviors vary greatly not only between species but also, in some species, between groups. Their expression, therefore, is evolutionarily labile.

Aggressive/submissive behaviors result in the establishment of dominance hierarchies. The simplest of these -- despotisms -- exist when a single individual is dominant over all other individuals, with no ranking among subordinates, so that there are only two levels. More complex hierarchies -- such as chains -- exist when there is ranking among subordinates and more than two levels.

The hierarchies that exist in human societies vary greatly in complexity. In some societies, hierarchies, except within families, are totally absent. A few hunter-gatherer societies, such as the Basin-Shoshone, are examples. In other societies, hierarchies are extraordinarily complex. In the United States, for example, the chain of command from the President to the ordinary private includes eight levels.

The hierarchies that exist in modern political communities differ from those that exist in other species in a very important way. All modern political communities are comprised of territorial subdivisions. These subdivisions are organized hierarchically and are comprised of of both related and unrelated individuals. For example, the state of Texas, a subdivision of the United States, has a growing population comprised of both related and unrelated individuals. Nearly all of these individuals are capable (will be, have been) at some time of

reproducing.

Such social organization appears to be unique to humans. Many species are capable of forming into large groups for purposes of feeding, hunting, or protection (Alexander, 1974). The characteristics of these groups, however, are much different from those of political communities.

Many large groups in other species do not have territorial subdivisions but only spacing between individuals. An example is a school of perch, which groups together because of the threat of predation, but does not divide up into subgroups.

Some large groups in other species do have subgroups that occupy territorial subdivisions. An example is a herd of wildebeeste which during the mating season is divided into separate harems. Another example is a flock of penguins in which mating pairs defend their nest and the area around it. In almost all cases, however, subgroups are comprised only of mates and related parents, offspring, and siblings.

Furthermore, in species that do have subgroups that occupy distinct territorial subdivisions, the subgroups are typically autonomous in the sense that hierarchical relationships do not exist between them. In a flock of gulls, for example, there is no leader or council able to insure the coordinated action of subgroups.

The large groups in species closely related to humans, including the chimpanzee, the gorilla, and the baboons, are also quite different from complex political communities. The subgroups in these species, unlike many social species, are often quite variable, including both related and unrelated individuals. Some examples include

juvenile play groups, bachelor bands, coalitions, and patrols (e.g., chimpanzees). As in complex political communities, it is also possible for hierarchical relationships to exist between subgroups. An example is a coalition of adult male baboons that is dominant over a bachelor band.

It is important to note, however, that these subgroups and the hierarchical relationships that sometimes exist between them are the result of competition over scarce resources (e.g., females) rather than coordinated actions between dominant and subordinate subgroups. Furthermore, the action does not pertain to something that is of widespread "public" importance. It is doubtful, for example, whether instances have been recorded in any of the higher primates (except (Homo sapiens) of a dominant individual (or group) compelling a subordinate individual (or group) to take action against a predator. This type of action occurs frequently within political communities.

The social organization of ants, bees, and wasps is also quite different from the organization characteristic of complex political communities. In those species which are subsocial, such as many wasps, dominant individuals (i.e., reproductives) to attempt to compel subordinate individuals to take specific actions. The dominant individuals, however, are ordinarily genetically related to the subordinates. Furthermore, the subgroups that result from such action do not occupy distinct territories. In those species which are eusocial, the subgroups or castes are ordinarily comprised of individuals (i.e., workers, soldiers) who are sterile and who do not reproduce.

Indirect Effects. There are also many indirect effects that warfare has upon gene frequencies. Due to their nature, however, their importance is difficult to estimate. In some instances their impact might easily outweigh that of direct effects.

Many indirect effects on gene frequencies result from the success or failure of particular military actions. The members of a political community typically have a different stake in the outcome of such actions and some benefit more from them than others.

(1) Polygyny. In simple political communities it is usually the political officials and warriors (and their families) who benefit the most from successful military actions. If women are captured, they become the wives or concubines of the warriors who captured them. With more wives than other men, these warriors have more children. Similarly, if booty like cattle is seized, it is kept by the warriors who seized it. With more cattle than other men, these warriors are wealthier and can provide for more wives and children.

Indirect effects like these are presumably the reason for the existence of warfare. At some period in the evolutionary history of humans, warriors who engaged in offensive military actions benefited from them. They gained additional land, plunder, prestige, or wives and used these to enhance their own reproduction or that of relatives (see Chapter 4).

(2) Patriotism. Patriotism is the zealous support of one's own political community. It is similar to other behaviors, such as cooperativeness. The spirit of patriotism is prominent in humans, especially among those in modern nation states, and is presumably the indirect consequence of the success of particular political communities

in warfare. Those political communities able to engender a spirit of
patriotism in their members would be more effective than others in
defending themselves. The genes of the members of these political
communities would increase in frequency in relation to the genes of
others in the population.

Political communities go to war for a variety of reasons (see
Chapter 4), but most of these are linked in one way or another with
resources that are relevant to survival and reproduction. Some exam-
ples are warfare to acquire agricultural or grazing land and warfare
to establish and protect a trading route. A political community that
is successful in warfare increases the stock of resources that is avail-
able to some or all of its members. These members are able to use these
resources to enhance their own survival and reproduction. The frequen-
cies of their genes increase in the population.

An historical example of a militarily successful political commun-
ity is Spain. The conquest by Spain of the political communities of
native American Indians was followed by Spanish settlement and a rapid
increase in the numbers of individuals of Spanish descent. The genes
of people of Spanish descent increased in frequency in relation to the
genes of the native American Indians.

A similar process would have occurred on a much smaller scale in
prehistory. The population of militarily successful political communi-
ties would grow and fission into separate daughter political communi-
ties. These would presumably enjoy a better than average chance of
success because of their military heritage. Their populations would
also grow.

A political community that is not successful in warfare will find that its stock of resources is diminished. It will lose territory and property and will be driven   to a less desirable habitat. Its membership will grow more slowly or decline, and the genes of its members will decrease in frequency in the population.

(3) Immunological System. Another indirect effect of warfare upon gene frequencies is a consequence of exposure of warriors to diseases, parasites, and food shortages. During military campaigns warriors may drink impure water, eat spoiled food, or become exposed to unsanitary conditions that cause diseases and the spread of parasites. Warriors may suffer from severe weather conditions such as cold, heat, drought, rain and snow for which they are unprepared. They may go hungry if their food spoils, is eaten by animals, is destroyed or stolen by the enemy, or is exhausted and not replenished. They may become exposed to new diseases and parasites as a consequence of contact with foreign populations. All of these conditions may be aggravated because of wounds suffered in battle, increased stress, and lack of medical care.

It is apparent, however, that these conditions would have been less serious in prehistory because of the short duration of military campaigns, the small size of military units (limiting the spread of diseases and parasites), and the location of hostile political communities at only a short distance (lessening the possibility of contact with new diseases and parasites).

A similar indirect effect is a consequence of the exposure of noncombatants to diseases, parasites, and food shortages. Noncombatants are often exposed to the same hazards as warriors. Some of these

hazards, such as diseases, are the result of contact with infected enemy and friendly warriors or with other carriers, such as mosquitoes and domesticated animals. Examples of diseases that have been transmitted during warfare to uninfected populations include smallpox and syphilis.

(4) Reciprocity. Reciprocity is the ability to give something to somebody or to do something for them in the expectation or hope that the favor will be returned. As a general category of behavior, it is applicable to most all types of interactions that occur between individuals within bureaucracies, legislatures, interest groups, and political parties and also to most types of interactions that occur between the officials or leaders of these political groups.

Reciprocity is relevant to explanations of the structure of large political communities (see Willhoite, 1980). To coordinate activities within them, political officials must have subordinates who they can recognize and know so that a basis is established for reciprocity. Otherwise, subordinates would do as they please. The division of a populous political community into territorial levels or subdivisions that are organized hierarchically enables officials at higher levels to recognize and know officials at adjacent and lower levels.

Alexander (1979) has argued that reciprocity in humans is an extension of nepotism. In small political communities almost all economic, social, and political interactions occur between relatives. Many of these are quasi-reciprocal in the sense that relatives are expected to return favors, although they sometimes may not. These reciprocal interactions are only slightly different from the types of

reciprocity that occur in complex political communities in which each

party to an interaction has a clear expectation of gain.

Warfare is an important indirect cause of reciprocity. As the

cause of large political communities, it is responsible for the econ-

omic, social, and political conditions that promote reciprocity.

(5) Parental Care and Female Distinctiveness. Warfare

may also have had indirect effects that led to a host of other adapta-

tions. Alexander and Noonan (1979) have supplied a list of thirty

traits that appear to be either unique or distinctively expressed in

humans. Of this list, nine are non-cultural. Three of the nine are

linked with parental care: longer juvenile life, greater infantile

helplessness, and menopause. Four of the nine are associated with

male-female interactions that have the apparent purpose of eliciting

the parental effort of the male: concealed ovulation, greater promin-

ence of female orgasm, unusually copious menstrual discharge, and

frontal copulation. Two of the nine seem to have other purposes:

upright locomotion and relative hairlessness.

The authors argue that all of these traits may be due to an

increasing prominence in human social life of intergroup competition.

Such competition would lead to larger and more cohesive social groups

and as a result place a greater value upon parental care. Larger

group sizes would result in intensified competition for resources.

In this context, juveniles would benefit greatly from parental protec-

tion and assistance. In addition, larger group sizes would present

new opportunities to manipulate social situations for personal advan-

tage. To do so with effectiveness would require an extended period of

socialization in which social skills could be acquired by instruction,

practice, and imitation, while at the same time, serious competition was avoided.

Warfare and Isolation.

It would seem likely, on the face of it, that warfare would engender animosities between groups and inhibit social contact and intermarriage between their members. This would restrict the flow of genes between groups. Genetic differences between groups would presumably increase.

For a number of reasons, however, warfare may not have been an especially potent cause of isolation of genetic materials in human evolutionary history. Indeed, there are good reasons for thinking that warfare was an important cause of population movement and diffusion of genetic materials.

One reason for this is the probable nature of warfare during the 99 percent of cultural history that humans lived in small hunter-gatherer groups. Common reasons for war -- including defense, retaliation and revenge, plunder, and women -- while they would engender hostilities between groups, would not always be effective in inhibiting social contact and intermarriage between their members.

This is because of the small size of groups, the high degree of genetic relatedness between members, and the reproductive advantages of outbreeding. These favored the practice of exogamy or marrying outside the group. The men of one local group would marry the women of other local groups, who would leave their natal groups to live with their husband in his group. Although groups that exchanged women in this way might in general enjoy friendly relations, these might

easily deteriorate in the event of adultery, assault, land encroach-
ment, murder, or theft. As a result, men may wind up engaging in war
with the same groups from which they obtained their wives.

A pattern of exogamy like this, involving the movement of marriage-
able women between geographically proximate groups, would result in a
substantial flow of genetic materials between groups. This would
diminish differences in gene frequencies between groups.

The following illustrates this. Assume that the frequency of a
particular allele in group "A" is 1.0, but in group "B" is 0.0. Assume
that the population of each group is 40. Half of each group are adults,
half children. Of the 20 children in each group, 10 are boys, 10 are
girls. Assume that each of these groups receives, in each generation,
about 1/5 of its women from the other group (i.e., two women).

The frequency of the allele in group A will obviously decline
after two of its women move to group B, and two women from group B
move to group A. It will be equal to the initial frequency of the
allele in group A, less the frequency of the allele among the emigrants
of group A times the proportion of emigrants, plus the frequency of the
allele among immigrants of group A times the proportion of immigrants.
After migration, the frequency of the allele in group A would be .95.
In group B, the frequency would be .05. In a single generation, there-
fore, migration due to exogamy would reduce the difference in the fre-
quency of this allele between the two groups by .10.

Migration due to exogamy would have less of an impact if the
initial frequencies of the allele in the two groups were more nearly
similar. For example, if the initial frequency of the allele in group
A was .6, and .4 in group B, migration due to exogamy would reduce this

difference by .02.

A common cause of warfare among simple political communities is the capture of women for use as concubines, wives, or slaves. This would also, like the practice of exogamy, result in the diffusion of genetic materials between groups.

Warfare between simple political communities may result in the diffusion of genetic materials in other ways. The political communities of a militarily successful society will grow in population, fission, and expand outward, coming into contact with new populations. The political communities of an unsuccessful society may fragment, and its surviving members emigrate or flee to other groups.

Warfare between complex political communities also results in the diffusion of genetic materials. Warriors engaging in offensive actions may rape their women captives. Or they may use women captives as concubines, wives, or slaves. Complex political communities may also take men as captives for use as slaves.

Warfare that involves the conquest and incorporation of defeated political communities sometimes results in widespread population displacement. Defeated populations may be requisitioned as corvée labor, as with the victims of the Inca, or in recent history, the victims of Germany in World War II. They may be forced onto or transported to reservations with other defeated populations, as with the Indian victims of the United States.

Some large, complex, and modern states, such as the Soviet Union and the United States, are the result of successful conquest that occurred only a century or so ago. The multiethnic character of these states should presumably diminish over time as interbreeding reduces

genetic differences between ethnic groups.

Summary

There are good reasons to think that natural selection in the context of warfare has had substantial effects on the traits of humans. These effects were both direct, as a result of combat casualties, and indirect, as a result of the failure or success of political communities in warfare. The relationships between warfare and directional changes in human traits have been complex. As a cultural practice, warfare has resulted in the evolution of non-cultural traits. These non-cultural traits, in turn, have facilitated the use of war as a strategy of competition with other groups of conspecifics.

CHAPTER 3

CULTURE AND PROCESSES OF CULTURAL CHANGE

As a social behavior that is unique to humans, politics is a
cultural phenomenon. It is necessary, therefore, to look at the concept
of culture and discuss various issues pertaining to its definition and
use. I argue that most definitions of culture are inadequate either
because they are ambiguous or because they do not lead to testable
hypotheses about culture's evolutionary function. I set out a defini-
tion that I hope resolves these difficulties. I also look at processes
of cultural change. These are similar in many ways to processes of
biological change. In other ways, however, they are different and far
more potent. I argue that warfare is an especially important cause of
political change because of its linkages with these processes.

Definitions of Culture

Culture is an important concept in the social sciences. It is
sometimes difficult to do research without it. In spite of its impor-
tance, however, there is no consensus in the social sciences as to
what culture is and how it should be defined. Most of the widely used
definitions of culture have significant disadvantages. None of them
address the question of the evolutionary significance of culture.

One definition of culture links it with symboling abilities or
human language. The anthropologist Leslie White (1959:3) thought that

82

culture was an "extra-somatic temporal continuum of things and events dependent upon symboling." This definition seems to identify a capability that is distinctively expressed in humans and that distinguishes human social life from that of other species.

There is a problem, however, if we use this definition and assume that culture is unique to humans. It has been known for centuries that social species other than humans are also capable of using symbols in communications. The honeybee, for example, uses a complex dance to indicate the location of a food source (Lindauer, 1961; Michener, 1973; von Frisch, 1954, 1967). Ants mark trails with chemicals (Morely, 1953; Wilson, 1971). Subordinate baboons grin and screech to signal that they will not fight (Altmann, 1967; Altmann and Altmann, 1974; Kummer, 1968; Jolly, 1974). In recent years, experiments with chimpanzees have shown that this species is capable of using symbols in many of the same ways as humans (Fouts, 1973; Gardner and Gardner, 1969, 1971; Mason, 1976; Premack, 1971; Rumbaugh et al., 1973).

Another problem with this definition is that things are ignored in human society that are not directly linked to the symboling capability but are nevertheless very important to survival. Things like shelters, fields, domesticated animals, seeds, and tools are obvious examples.

Another problem arises from defining culture in terms of a capability such as language that is general to humans. Such a definition will not help us understand why the methods that humans use to adapt to their environments are so different across space and time — indeed, why languages are so different.

A second definition of culture emphasizes the characteristics of tools and the use to which they are put or what the anthropologist calls an industry. Tools reveal much about a society's technology and methods of subsistence. Those that are made of bone or stone are among the most durable of all artifacts. Since they are found in large numbers, they often comprise much of the material evidence that exists of extinct cultures.

An example of a definition based on tools is Raymond Dart's (1952) label "osteodontokeratic" to describe the culture of australopithecus. He thought that the distinguishing feature of the culture of this species was the use of tools constructed from bone. Another example, pertaining to the lower paleolithic, is Movius' (1949) distinction between the Chelles-Acheul hand-axe culture located west of the Himalayan barrier and the chopping tool culture located to the east. The major problem with a definition of culture based on tools is that tools may be of little help in predicting other cultural traits.

A third definition looks upon culture as the transmission to subsequent generations of non-genetic information. This transmission occurs through social conditioning, imitation, and instruction. It is different than transmission in biology which involves genetic information.

There would seem to be a number of problems with this definition. First, culture is not independent of the evolutionary processes that change gene frequencies (Alexander, 1979:73-82). Culture, including the transmission of non-genetic information, depends upon the existence of individuals or genetic replicators with particular abilities. An example is the ability to speak and understand a language. The

information contained in a specific language is non-genetic. It is acquired by social learning. Such learning would be impossible, however, if there was no genetic information to produce the receptors, nerves, brain structures and muscles necessary for language development.

A second problem is that non-genetic information acquired through social learning is not always cultural in the ordinary sense of the word. For example, in primate groups juveniles seem to use play as a way of sharpening social skills (Fady, 1969; Fossey, 1979; van Lawick-Goodall, 1968). Although this play involves substantial social learning, it is not clear that it is cultural. Something that is cultural should presumably vary from group to group and should do so for at least some length of time. It is doubtful that play in primate groups is cultural in this sense.

A third problem with this definition is that it overlooks the transmission to subsequent generations of things that are not information in the ordinary meaning of the word. Artifacts like houses, fences, tools, and weapons are material objects and may be transmitted independently of the information needed to construct, use, and maintain them.

A fourth definition of culture, because of its obscurity, seems to be more profound than others. Some anthropologists have defined culture as a set of common understandings or customs that are largely irrational, occasionally mystical or superorganic, and largely self-generating (Benedict, 1934; Boas, 1911; Sahlins, 1976). Culture should be looked at in its entirety. A problem with this definition is that it reifies societies, denigrates the importance of individuals

within societies, and therefore, discourages investigation into the origin, change, and diffusion of cultural traits using the cross-cultural method.

All of these definitions above overlook the problem of identifying the evolutionary significance of cultural traits and distinguishing them from other phenotypic traits. In regard to the evolutionary significance of cultural traits, it seems highly probable that it is the same as that of other phenotypic traits. Cultural traits, like other phenotypic traits, should be functional. They should insulate individuals from the action of Darwin's hostile forces and on that account enhance the inclusive fitness of the individuals who construct, use, maintain, and transmit them. This should be true in general, but because of the introduction of novelty in culture, not necessarily always true.

In distinguishing cultural from other phenotypic traits, the major distinction is that cultural traits are extra-somatic, non-cultural traits are not. Something that is cultural, such as a government building, is extra-somatic. It is a part of the environment. On the other hand, something that is non-cultural, such as eye color, is somatic. It is not a part of the environment.

This distinction, unfortunately, is not always so clear-cut. What about language, for example? On the face of it, language would seem to be somatic since its acquisition and use requires a brain with a structure that prefigures its existence (Chomsky, 1972). However, language also seems to be extra-somatic. It is an important component of the social environment into which individuals are born and live. Its acquisition depends upon appropriate audio and visual

stimuli. This latter interpretation seems somewhat more appropriate if we imagine the pathological situation of an individual who is isolated from the social stimuli that make it easy to learn a language, as is someone who is unfortunate enough to have hearing, visual, or speech difficulties.

There is one other important distinction between cultural and non-cultural traits. A cultural trait is a transformation of the environment that is basically opportunistic in the sense that the individuals who construct, use, maintain, and transmit it respond flexibly to the situation at hand. This implies that individuals are able to transform the environment in different ways to produce new things, if necessary, and to respond appropriately to the consequences of such novelty. For all of these reasons the ontogeny of a cultural trait necessarily involves behavior.

This is not necessarily true of a non-cultural trait. Its ontogeny may not involve behavior to any significant degree. And even if it should involve behavior, the environment may only be exploited and not transformed, or if the environment is transformed, this may not be done in a way that is opportunistic.

This distinction is not always easy to make. We might ask, for example, whether the nests that birds construct are cultural or non-cultural. Nests would seem to be cultural because they are extra-somatic and are transformations of the environment. The only remaining issue is whether the construction of nests is opportunistic. The answer would seem to be no -- there is little evidence to indicate that birds modify the size, depth, diameter, construction, and appearance of nests similar to the ways that humans design and build

houses.

On the basis of these two distinctions, the following definition of a cultural trait seems appropriate: a cultural trait is a transformation of the environment that is opportunistic and that functions as an extra-somatic extension of the phenotype. A culture, using the preceding definition, is the total collection of cultural traits that exists in a society at any time. A consequence of social life, it is the most important component of the environment into which humans are born, grow to maturity, find mates, have children, compete with others for resources, help others to secure resources, grow old and die. Those aspects of culture that we associate with politics are simply transformations of the environment that occur because of conflicts of interest at two levels: first, conflicts of interest between political communities or coalitions of political communities; and second, conflicts of interest between individuals or coalitions of individuals within political communities that are important enough to be of widespread public importance.

Processes of Cultural Change

Political communities, as cultural phenomena, are subject to processes of cultural change. An understanding of these processes, therefore, is essential to explain political communities and the nature, direction, and tempo of changes to them. Unfortunately, however, social scientists strongly disagree on the nature of these processes and their relative importance to cultural change. This has impeded progress in social theory.

Most social scientists have emphasized a single process of cultural

change and overlooked or deemphasized other processes. Much research on cultural change, therefore, has been accompanied by rather arbitrary assumptions.

The evolutionary theorists of the 19th and early 20th centuries thought that cultural selection was the most important process of cultural change. Cultural selection was closely analogous to and directly linked with natural selection. At the level of the political community, warfare was the most important cause of cultural selection. According to Walter Bagehot (1877), those political communities whose members were tamest and strongest would survive; other political communities would perish. The success of large and complex political communities in warfare explained their survival. They used efficient military practices and were better adapted to warfare than their smaller and less complex competitors.

At the level of the individual, natural selection favored those who were better able than others to provide for themselves and their children. According to Herbert Spencer, these were individuals who were the most creative, energetic, and intelligent within their societies and made the greatest contributions to them. Any intervention by government to promote social welfare was self-defeating because by interfering with the action of natural selection it impeded social progress.

The diffusion theorists of the early 20th century, such as Frank Boas (1911), argued that diffusion of the spread of traits from society to society was the most important process of cultural change. These theorists were impressed by the many similarities that existed between neighboring societies. This suggested the importance in

cultural change of practices like exogamy, migration, trade, and warfare. Since cultural traits were acquired by diffusion, the best way to understand a society was to locate it within a specific spatial and temporal context. Furthermore, cultural traits were not necessarily functional. Their survival over time often depended upon chance.

The cultural ecologists, such as Julian Steward (1955), like the evolutionary theorists, emphasized the process of selection in cultural change. They argued that the cultural traits of societies were adaptations to specific environments. Traits that enhanced the ability of a society to survive and prosper were adopted and retained; those that did not were abandoned. The natural ("organic") environment included things like climate, fauna, flora, soils, and topography. Variations in the natural environment helped explain differences between societies in methods of subsistence. The cultural ("superorganic") environment included neighboring societies. Variations in this environment helped explain differences in socio-political complexity.

It is apparent that social scientists have found it difficult to identify and determine the importance of various processes of cultural change. There seem to be two major problems. One problem is identifying the process that is most responsible for directional change in the frequency of cultural traits, and hence, cultural evolution. Another problem is determining the units in which directional change occurs and should be measured. It is unclear whether the individual, the society, or the culture is the appropriate unit of analysis.

In recent years the evolutionary biologists Alexander (1979) and Cavalli-Sforza and Feldman (1981) have suggested that processes of cultural change appear to be analogous to processes in organic evolution.

This analogy is useful because it highlights similarities and linkages between biological and cultural change. It also leads to consideration of differences that the analogy does not address. A detailed comparison of these processes suggests that warfare is an especially important cause of cultural change.

Cultural Inheritance.

In organic evolution the process of inheritance involves the replication of the genetic materials of parents and the transmission of these to offspring in a form that is mostly or entirely unchanged. The success of this process depends upon the ability of genetic materials to express themselves with fidelity in ordinary developmental environments. Those genetic materials that did this -- that produced a heritable phenotype -- replicated more often and/or more frequently than those that did not.

In cultural evolution the process of inheritance is quite different. Cultural traits, unlike non-cultural ones, exist extra-somatically. Their expression is not as directly dependent upon the continuous action of genetic materials. For example, an artifact such as a spear will retain its physical properties for a period of time even though the warrior who uses it happens to die in battle. The same is not true of the somatic components of his phenotype.

The ability of a cultural trait to survive the individual who constructs, uses, and maintains it results in a type of inheritance that is quite different from that in organic evolution. Cultural traits that individuals acquire during their lifetimes can be transmitted to subsequent generations. This is not true of non-cultural traits.

In organic evolution inheritance is successful if the genetic ma-
terials are transmitted to offspring in a form that is unchanged. For
single genes, this form is an identical chemical structure, or one that
has not changed due to a point mutation. For chromosomes this form is
also an identical chemical structure or one that has not changed due
to an increase in haploid number, a deletion, a duplication, an inver-
sion, or a translocation. Most of these changes to the genetic mater-
ials do not occur very often because the cumulative effect of natural
selection has been the packaging of genetic materials in forms that
are not easily disrupted and that are expressed reliably.

In regard to cultural evolution, inheritance is successful when
a cultural trait is transmitted to subsequent generations in a form
that is unchanged. The function of cultural inheritance is presumably
that parents are able to transmit things to children (or to other rela-
tives in succeeding generations) that will improve their chances of
survival and reproduction.

In the broad sense, inheritance includes resources of all types.
It includes economic resources such as domesticated animals, land,
houses, and tools. It includes social resources such as abilities to
distinguish relatives of differing degrees, knowledge about the environ-
ment, occupational skills, social identifications, beliefs about the
supernatural, and language and other communications skills. It in-
cludes political resources such as personal connections and political
office.

It seems reasonable that parents would be most concerned with
transmitting resources that are of greatest relevance to their
children's survival and reproduction. These resources, of course,

would vary from society to society. In pastoral societies the rele-
vant resource is cattle, in agricultural societies it is land, and
in technological societies it is wealth, education, and skills. Resour-
ces such as these are more likely to be transmitted to subsequent gen-
erations than others.

The characteristics of cultural traits may also affect whether or
not they are transmitted in a form that is unchanged. One of these
characteristics is durability. An artifact that is able to resist
deterioration and destruction by hostile forces such as weather is
more likely to be transmitted in a form that is unchanged than one that
is not. Another characteristic is replicability. An artifact that is
easier to duplicate is more likely to be transmitted in a form that
is unchanged than one that is not.

The durability and replicability of cultural traits, of course,
are often purposive. An example is coinage. Governments use standard-
ized manufacturing methods to insure that coins of a particular denom-
ination and vintage are identical. If governments did not, coins
would be labelled as counterfeit or would be hoarded by collectors and
in either event would disappear from circulation. Manufacturing
methods insure that the heritability of coinage is quite high.

Cultural Selection.

In organic evolution natural selection is the differential repli-
cation of genetic materials caused by the action of various hostile
environmental forces. This process is inevitable because there are
genetic differences between individuals that affect their relative
ability to survive and reproduce.

In cultural evolution selection is any change in the frequency of cultural traits that occurs because of differences in the effects of traits on the individuals who construct, use, maintain, and transmit them or because of differences in the durability of traits. This process is different from natural selection since cultural traits, unlike other components of the phenotype, are extra-somatic. Their survival across generations, therefore, is not entirely dependent upon the replication of particular genetic materials. Their relative success in spreading is not necessarily affected by the differential replication of genetic materials.

Although selection is probably the most important process leading to directional change in the frequency of cultural traits, little is known about factors that determine the directions and rates of selection in particular cultures. In this regard, theory in culture is less advanced than theory in population biology.

Selection in cultural evolution would seem to depend largely upon the phenotypic effects that traits have upon the individuals who construct, use, maintain, and transmit them. Selection would also depend, however, upon the durability of traits or their ability to resist destruction by the environment.

Phenotypic Effects. The supposed function of cultural traits is to insulate individuals from the action of hostile environmental forces. ^ cultural trait that does this has psychologically (or phenotypically) rewarding effects upon the individuals who use it. These effects, however, may be either more or less rewarding than the effects of alternative cultural traits with the same function. If the effects are more rewarding, the cultural trait should increase

in frequency. Individuals should prefer to use it rather than its alternatives. If these effects are less rewarding, however, the cultural trait should decrease in frequency in relation to its alternatives.

An example of cultural selection is the adoption of firearms in place of bows and arrows. These are both projectile weapons. They have the same function of killing the enemy at a distance. Firearms replaced bows and arrows, however, because warriors found that they were more accurate, easier to use, and had greater penetrating power and a longer range.

A cultural trait that is rewarding enhances the sense of well-being of individuals. This sense of well-being and the human nervous system in which it exists have the evolutionary function of enabling individuals to respond appropriately (in ways that enhance inclusive fitness) to environmental contingencies. A cultural trait that is rewarding in this sense should generally enhance the inclusive fitnesses of individuals.

A cultural trait that enhances the inclusive fitness of the individuals who construct, maintain, and use it should increase in frequency for that reason, whatever its phenotypic effects. This should occur because individuals are the carriers of cultural traits and transmit them to subsequent generations. An example is the Catholic woman who because of her religion does not use birth control or abortion to control the size of her family. Her Catholicism is a cultural trait that enhances her inclusive fitness in relation to Protestant women who do use birth control or abortion and have smaller families. To the extent that she and other Catholic women like herself are successful in transmitting their Catholicism to their children, the overall

frequency of Catholics should increase.

Although most cultural traits should enhance inclusive fitness, some may not. Some formerly advantageous traits become disadvantageous because of a change in the natural or social environment. For example, while education would seem to be of significant help in obtaining a higher standard of living, such an investment may actually diminish reproductive success. In the modern state of Israel, for example, the efforts by Jews to obtain a higher standard of living for themselves and their children has probably depressed their reproduction relative to the Palestinians, who do not have (or think that they do not have) the same economic opportunities.

The evolutionary biologist R.A. Fisher (1958) has argued that conditions of civilization encourage the social promotion of individuals with heritable infertility. Those individuals with large families have a substantial economic burden that prevents them from acquiring the education and wealth to achieve social success. Those individuals with small families, on the other hand, have less of a burden and are more likely to be socially mobile because of this. As they and their children move into a higher social class, they carry their heritable infertility with them into this higher class. Thus, it would seem that cultural traits such as education and wealth that have rewarding effects and presumably enhance inclusive fitness can put individuals into a social (and genetic) environment where gains in inclusive fitness are less likely.

Some traits that were formerly advantageous become disadvantageous because of invention or improvement to existing traits. An example is the modern battleship which has lost much of its effectiveness because of its vulnerability to improved generations of radar guided

missiles. Traits that become disadvantageous for these reasons should decrease in frequency.

Some traits exist because of their rewarding effects, but because of their novelty, may actually be disauvantageous. A possible example is the hydrogen bomb which seems to deter enemy attacks but at very great risk. Other examples are the many drugs, such as amphetamines, heroin, and marijuana, which have rewarding short term effects but are probably hazardous if used for long periods of time. Traits such as these that have rewarding effects may increase in frequency even though they actually diminish the inclusive fitness of the individuals who use them. Individuals do not respond appropriately to them because of their novelty.

Traits that perform the same function may be differentially advantageous for other reasons. Some traits are easier to construct, maintain, and transmit than their alternatives. Since they are less costly but equally useful, they are more rewarding than their alternatives and should increase in frequency.

An example is party identification. Studies of the process of political socialization show that parents transmit party identifications to children with much greater success than other orientations, such as political ideologies and issue positions (Jennings and Niemi, 1977). This is probably because party identifications are simpler and easier to understand than ideologies and issues and are an economical way of sorting out the complexities of politics. In any case, a parent's party identification is likely to survive in one or more of his children whereas a political ideology or issue position probably will not.

The characteristics of traits that make them easy to construct, maintain, and transmit are often purposive. A well known example is the Model-T which made automobile transportation inexpensive and reliable for the first time in history.

An important thing about culture is that much of it is differentially advantageous to individuals. Since phenotypes are different, what is rewarding to one person may not be rewarding to another. This necessarily results in conflicts of interest. As individuals try to use culture for their own advantage or to change culture in directions that they prefer, they will come into conflict with others whose interests are different.

It seems likely that the amount of variation in phenotypes would be correlated with rates of cultural change. With little variation, people respond to cultural traits in the same way, so that there is less chance of inertia. With much variation, people respond in different ways, so that there is greater chance of inertia.

An illustration of this principle is the different rates at which novel cultural traits are adopted within societies. When everyone (or nearly everyone) benefits from a cultural trait, it is adopted quickly and becomes widespread. An example is an invention like television. When only some people benefit from a novel cultural trait, it is adopted more slowly or not at all and does not become widespread. An example is Darwin's theory which was accepted only in the natural sciences, where it was appreciated.

The direction and rate of cultural change should also depend upon the relative power of different individuals (groups) within societies. Those individuals (groups) with greater economic, social,

and political power will be more successful in shifting culture in directions that they prefer rather than in directions preferred by their less powerful competitors.

When there is an extreme asymmetry of power, those who hold power have a disproportionately large influence on the direction and rate of cultural change. In most societies those who hold large amounts of power benefit from the status quo and have a vested interest in maintaining it. Their efforts to prevent change and to preserve the status quo contribute to cultural inertia. An historical example is feudalism in Western Europe. A contemporary example is communism in the Soviet Union and the countries of Eastern Europe.

When there is less of an asymmetry of power, there is less chance that any individual (group) will have a disproportionately large influence on the directions and rates of cultural change. In these situations rates of cultural change would seem to depend upon the stability of balances of power between individuals (groups).

In complex political communities, such as some industrial democracies, balances of power between social, economic, and political groups are relatively stable, so that efforts to upset them do not succeed very easily. In some countries, such as Italy, this has resulted in political inertia.

The same is not true of simple political communities. Their small size encourages efforts to upset prevailing balances of power. Individuals and kin groups often resort to fighting or feud to restore actual or perceived threats to their person, property, or status. The failure to resolve disputes peaceably can lead to fissioning of the political community or its breaking up into separate, autonomous

political communities.

The rate of cultural change should also depend upon the amount of variation that exists in cultural traits. When there is little variation, phenotypic effects are similar, the intensities of selection of different cultural traits are similar, and the rate of cultural change is slow. When there is great variation, however, the rate of cultural change should be fast.

An illustration of this principle is the evolution of tools. In most of prehistory, variations between tools with the same function were not very great. For example, one chopper was not that much different from another. With little variation there was little opportunity for substantial selection and the characteristics of tools changed very slowly. In recent history, however, variations between tools with the same function, such as plows, have been great. The characteristics of tools have changed rapidly.

The rate and direction of cultural change should also depend upon the level of cultural selection. Although cultural traits are not necessarily part of an interdependent package as is true of genetic materials, important interdependencies do exist between them, so that the survival and spread of one trait is dependent on that of another. In this sense, cultural traits are linked together somewhat like the genes on a chromosome.

A contemporary example is the linkage which exists between free elections and a competitive party system. Free elections seem to be a necessary condition for the existence of a competitive party system. If they disappear, so also does the competitive party system.

The extent and strength of these linkages would seem to affect the

direction and rate of cultural change. An increase in the frequency of some cultural traits, such as automobiles, leads to correlated increases in a great number of related cultural traits, such as filling stations, spare parts, and highways. An increase in the frequency of other cultural traits, such as umbrellas, however, does not do this or does so to less of an extent.

Military practices and the political communities which construct, use, maintain, and transmit them are among the most important of all cultural traits. This is because of their linkage to the survival of societies and to the prospects of survival of cultural traits within them.

Durability. Cultural traits vary in the extent to which they resist hostile environmental forces, such as weather, that cause deterioration and eventual destruction. Those traits that are able to resist these hostile forces should increase in frequency in relation to other traits.

An example of this is architecture. In many older cities the only buildings that survive from earlier periods are those that were well constructed and built of the best materials. The distinct impression is that modern buildings are quite shoddy. Of course, the buildings that survive from earlier periods are among the best of their periods and not representative.

Another example is written knowledge. This knowledge can survive from generation to generation in libraries that are largely protected from hostile environmental forces. If knowledge is not written, it may be lost if the individuals who discover, use, and transmit it die.

The durability of a cultural trait is often purposive and linked with its function of insulating individuals from the action of hostile forces in ways that enhance inclusive fitness. With regard to artifacts, very few should be designed to last more than a single lifetime, or if the overlap in generations and the potential for nepotism is allowed, more than several lifetimes.

In modern societies, manufacturers use technology to program durability. Things bought for fashion, such as a woman's handbag, may last less than a year. Things bought to last a lifetime, such as appliances and furniture, may last for ten years or longer. Things like houses and collectibles last much longer and are often transmitted as inheritance.

Artifacts do exist that are conspicuous exceptions. These are generally the artifacts of large social institutions. The United States Capitol building, for example, was constructed of stone during the Civil War and is in much the same shape today as it was originally. Such structures are built to be durable for a reason. Individuals share with others a long term interest in the survival of large social institutions. (Governments give protection from hostile foreigners, schools educate children, and churches sustain family life.) They see these benefits as extending beyond their own lifetime and into the lifetimes of their children and grandchildren. To express their concern, they construct buildings of granite, marble, reinforced concrete and other durable materials.

In some cases the durability of an artifact is not purposive but is unintended and disfunctional. An example is a weapon system, such as an airplane, that becomes obsolete. Another example is a nuclear

power plant that produces radioactive wastes that last millions of years.
To some extent, societies become cluttered with dangerous and useless
junk.

Cultural Mutations.

In organic evolution, mutations are changes that occur to the struc-
ture of genetic materials. As indicated in Chapter 2, such changes are
almost always deleterious because they occur without regard for the
possible effects they will have on individuals and therefore are likely
to disrupt an organization of genetic materials that is already function-
al.

In cultural evolution, mutations are new cultural traits or changes
to existing cultural traits that are not simply a consequence of expo-
sure to hostile forces (for example, the changes to a steel tool that
occur because of oxidation are not mutations). Mutations in culture
result from a variety of things: from sheer accidents of history
(e.g., the discovery by Darwin of natural selection because of his
voyage on the Beagle), from problem solving activity (e.g., the Man-
hattan project), and from trial and error (the discovery of penicillin).

Mutations in culture, unlike mutations in organic evolution, are
an especially prominent cause of change in the frequency of traits.
Cultural mutations are quite likely to be functional improvements. This
is because of the ability of humans to anticipate their potential conse-
quences. New cultural traits will be introduced or changes to existing
cultural traits will be implemented only if there is some hope or expec-
tation that people will find them more desirable or useful than traits
already available.

A number of factors would seem to affect rates of cultural mutation. Perhaps the most important cause of cultural mutation is intersocietal contact. Practices such as exogamy, migration, trade, and warfare result in the infusion into societies of new cultural traits. More frequent and intensive contact should be associated with higher rates of cultural mutation.

Another cause of cultural mutation is the incentive that exists in some societies to create, discover, and invent new things. In such societies there is a bias in culture in favor of change. In modern, technological societies, for example, substantial economic rewards may follow from the development of new and more useful products, like pharmaceuticals.

In other societies, however, there is little incentive to create, discover, and invent new things. A common cause of this is the opposition of powerful individuals (and groups) who see novelty as a threat to their own positions. They are able to use their power to stop its appearance and spread. In the modern world this is an especially important phenomenon in countries where political elites look upon alien culture as a threat to their own rule. Examples are the political elites of China and the Soviet Union.

Cultural Isolation (Diffusion).

Geographical barriers such as oceans, mountain ranges, and deserts discourage contact between societies and the diffusion of cultural traits between them. The cultural traits of societies that are isolated from others do not change as a result of diffusion but rather as a result of other evolutionary processes, namely cultural selection and cultural

mutation. Since the effects of these two processes upon cultural traits vary from society to society, isolation results in the emergence of differences in cultural traits between societies.

One of the most important effects of isolation in humans is the appearance in cultural history of thousands of distinct languages. Geographical (and perhaps, political) barriers prevented contact between societies. In historical times these barriers have broken down to some extent due to migration, trade, and warfare, and many languages have lost their distinctiveness or have become extinct.

Cultural diffusion is the spread of traits between societies as a result of exogamy, migration, trade, and warfare. It tends to diminish differences in cultural traits between societies.

Cultural Drift.

In organic evolution, drift is a change in gene frequencies that is due to random processes. Random processes might also affect the frequency of cultural traits. It might be difficult, however, to show that the effects of these processes were actually random and not systematic.

A possible example of drift in cultural evolution is the random destruction of cultural artifacts that occurs because of the random action of hostile forces. For example, it would seem that many of the destructive effects of war, because of their unpredictability, are at least partly random. One building is destroyed by a bomb while another is not.

Another possible example is the so-called founder effect. The cultural traits of new societies may differ for apparently random reasons from those of the original parent society. An example may be

the small cultural differences, such as in language and kinship termin-
ology, that exist between the island societies of Polynesia. These
islands were occupied by migrations in sea-going canoes that began
about two thousand years ago.

Warfare and Processes of Cultural Evolution

In the late 19th and early 20th centuries social scientists thought
that warfare was of great importance in determining the directions and
rates of cultural change. Their views about societies are especially
intriguing because of the obvious importance of warfare in history.
Their views also tie in very neatly with those of evolutionary biolo-
gists about the importance of warfare in the evolution of human
biological traits.

The general argument of these social scientists was quite simple.
The survival of cultural traits depends to a large extent upon the
survival of the political communities in which they are found. The
analogy in biological evolution is the gene which depends for its sur-
vival upon the success of the genotype as a package. This apparent
dependency led to a focus on warfare and its effects upon the economic,
social, and political characteristics of societies.

Warfare would seem to have a number of important linkages to proces-
ses of cultural evolution, especially selection, mutation, and isolation.
The following sections discuss these linkages.

Warfare and Cultural Selection.

Warfare would seem to have many effects on the frequencies of
cultural traits. One effect results from the possibility or expectation
of war. When there is threat of war, political officials commit

additional resources to the recruitment, training, and equipping of military units and to improving defenses.

Another effect results from military actions. These often result in substantial damage and destruction to artifacts. Those artifacts that are directly affected include weapons and other military material. Other artifacts may also be affected. In agricultural societies, fences may be cut, fields burned, domesticated animals killed, tools broken, and warehouses pilfered. In technological societies, the targets of military action include airports, bridges, factories, military bases, roads, and telephone and telegraph lines. Military actions also result in the deaths of non-combatants and warriors and the loss of their knowledge and skills. In small political communities these individuals may be irreplaceable so that the losses of knowledge and skills are permanent.

Another effect results from the relative success of political communities in warfare. The cultural traits of successful political communities increase in frequency; those of unsuccessful ones decrease in frequency. This happens because success in warfare is accompanied by gains in population, property, and territory. Failure, however, is accompanied by losses. Changes in population have an especially large effect upon the frequency of cultural traits since individuals are their carriers. The cultural traits of political communities that are growing in population increase in frequency in relation to the traits of ones that are growing less quickly or declining in population.

An historical example is North America. The cultural traits of the growing population of the United States increased in frequency in relation to the cultural traits of the stable or declining populations of

the American Indian tribes.

In simple political communities population growth typically results in fissioning and the appearance of new, smaller political communities. These new political communities will possess many of the cultural traits of their parents leading to an increase in the frequency of these traits.

The relative success of political communities in warfare also affects the direction of cultural selection in other political communities. The cultural traits of successful political communities have passed a critical test of survival. They are seen by other political communities to be superior on that account. An example of this is the praise given to weapons made in Israel and the United States, largely because of the successes of Israel in its wars with different Arab states, which relied heavily upon Soviet weapons.

Among all cultural traits, those that should be most directly and profoundly affected by selection in warfare are the activities and structures of political communities. If the intergroup competition and conflict argument is true, the function of these is the defense of individuals from the attacks of hostile political communities. To the extent that political communities fail in performing this function, they should either become extinct as a consequence of conquest or disintegrate as a consequence of fissioning. The consequences for political communities of selection due to warfare is the major theme of Chapter 6.

Warfare and Cultural Mutation.

New cultural traits or changes to existing cultural traits are of particular significance in the context of warfare. The invention of a

new weapon or tactic may give a political community a substantial military advantage over its competitors and disrupt prevailing balances of power. The success of such a political community in warfare, as I argued above, should result in an increase in the frequency of its cultural traits.

It is difficult to overstate the significance in history of new weapons and tactics. Some well known examples include the Roman innovations in military organization, tactics, and training, the heavy horse of the Middle Ages, gun powder, the machine gun, and nuclear weapons. Such inventions typically have widespread political repercussions.

A well known example from ethnographic history is the formation of the Zulu nation in the 19th century in what is today part of South Africa. The events that led to this were told to ethnographers by individuals who actually witnessed them firsthand (Bryant, 1919; Gibson, 1911).

Around 1800 much of what is now South Africa was home to a large number of small and mutually hostile tribes. A leader of one of these tribes, Dingiswayo of the Mtetwa, came up with several military innovations. The first was the age-graded regiment, and the second was a policy of ruling indirectly over defeated tribes. These innovations worked splendidly, for by the early 1800s Dingiswayo had conquered a large number of tribes and integrated their military units into his own. After his death, a brother named Shaka took power. Shaka proceeded to replace the long javelin, a weapon that was thrown and often missed its target, with a short stabbing spear that was a much more lethal weapon because it could only be used by coming into direct

contact with the enemy. To make this weapon even more effective, Shaka introduced line formations which permitted his troops to surround the enemy while closing. With these tactical innovations Shaka was soon able to defeat all of the remaining hostile tribes. After these victories, Shaka, and later his younger brother Mpande, integrated the various conquered tribes into a Zulu nation.

The Zulu nation is a state that formed as a result of the fusion of simpler polities. In this case, the Zulu acquired new weapons and tactics and used these for conquest. The victorious Zulu incorporated the defeated tribes, strengthened themselves militarily, and invented a totally new type of political structure that completely disrupted the prevailing balances of power between the small tribes of the region. The process of conquest and fusion continued inexorably until the Zulu confronted other strong states on their borders: the Swazi, and Thonga to the north, the Boers to the west, the Batsuto to the southwest, and the British to the south (see the account in Service, 1975), and a balance of power was reestablished.

The threat of warfare is itself an important stimulus to invention of new weapons and tactics. In a competitive milieu, those political communities that do not acquire inventions or do not find ways to prevent or counteract their use in warfare risk military defeat and the loss of population, property, territory, and ultimately, sovereignty. Thus, political communities that are threatened have a substantial incentive to introduce and adopt new weapons and tactics in the hope or expectation that these will enhance military capability, and hence, security.

An historical example of external threat stimulating cultural change is Japan. The humilitation suffered at the hands of Admiral Perry shattered Japanese illusions of cultural superiority over the West. Another historical example is the United States. The launching of Sputnik was followed by widespread doubt and fear. This eventually led to increased investment in scientific education and research, much of which was justified on the grounds of its importance to national defense.

Warfare and Diffusion.

Warfare is an important cause of diffusion of cultural traits. This is especially true when the enemy is a distant political community and is more likely to be culturally dissimilar. Diffusion occurs in both directions -- from the attacking political community to the attacked, and vice versa.

One cause of diffusion in warfare is hostile action between military units. Such action is an important source of new tactics and weapons. For example, poorly equipped guerilla units often rely heavily on ammunition and weapons captured in combat with government units. Sometimes these are transported to guerilla units operating in different countries. Another cause of diffusion is contact between the military units of allied political communities. An example is the knowledge of English customs, language, government, and military practices acquired by the colonies.

Another cause of diffusion is the intrusion of attacking military units onto the territory of the enemy. A successful military action may yield plunder, such as precious goods, cattle, and weapons. Such

action may also yield captives for use as concubines, hostages, or slaves. The beliefs, knowledge, language, and skills of these aliens will be introduced into the culture of the successful political community. This diffusion, as indicated above, is a significant source of novelty. It presumably enriches culture in the sense that the variance of cultural traits increases. This may result in a change in the direction of culture. It is also likely to increase the rate of cultural change because of intensified selection.

An important historical example of cultural change as a consequence of diffusion is Rome. The victorious Romans imposed their own forms of administration, law, and taxation on their foreign conquests. Their victories, in turn, resulted in the constant infusion into Rome of foreign artifacts, crafts, languages, and religions.

Summary

A useful definition of culture should link it with its evolutionary function of enhancing the inclusive fitness of individuals. From this perspective, a cultural trait is a transformation of the environment that is opportunistic and that functions as an extrasomatic extension of the phenotype. A culture is the total collection of cultural traits that exists in a society at any time.

The processes of cultural evolution are somewhat analogous to those of organic evolution. Three seem to be especially important as causes of directional change in cultural traits: cultural selection, cultural mutation, and cultural diffusion. Unlike organic evolution, the causes of selection and mutation in culture are not independent, because of the abilities of humans to anticipate the consequences of novelty.

Warfare has important linkages to cultural selection, mutation, and diffusion, and because of that, is a major cause of cultural change. This should be especially true of political change if defense is the necessary and sufficient function of political communities.

CHAPTER 4

CAUSES OF WAR

Controversy over the causes of war is probably as old as war

itself. Not surprisingly, there are many views on this issue. An

extensive review by Keith Otterbein (1973) has identified as many as

seven different approaches to the causes of war.

The "innate aggression" approach attributes war to the biological

propensities of humans to use aggression. Works by McDougall (1926),

Ardrey (1966), and Lorenz (1966) are examples of this approach. The

"frustration-aggression" approach attributes war to frustrations

induced by unfulfilled social and psychological needs. Works by

Dollard (1944) and Murphy (1957) are examples. The "diffusion"

approach argues that war is a cultural invention that appeared in

one locality and quickly spread to other areas of the world. Works

using this approach include those of Mead (1940) and Schneider

(1952).

The "physical environment" approach attributes war to methods

of subsistence, such as pastoralism or shifting agriculture, and the

competition that these engender. Examples of this approach include

works by Ekvall (1961) and Vayda (1961).

The "goals of war" approach, which Otterbein (1970) advocates,

focuses upon the objectives that military organizations have in

going to war. He identifies six of these--subjugation and tribute,

114

land, plunder, trophies and honors, defense, and revenge. Military organizations may have multiple objectives in going to war and these may change over time.

The "social structure" approach, which pertains to war in simple political communities, attributes war to the presence of fraternal interest groups that unite genealogically related men. Works that use this approach include Velzen and van Wetering (1960), Sahlins (1961), and Otterbein (1968a, 1968b). The "military preparedness" approach sees military readiness as a direct cause of war. Political communities are more likely to become involved in war if they are prepared for it. A study by Naroll (1969) found only weak support for this theory. Tests of the converse of this theory, the notion that military readiness is a deterrent, have also found little support (Naroll, 1966,1969; Otterbein, 1970). The "cultural evolution" approach is the last one Otterbein identifies. It interprets the various types of war that exist as a direct consequence of the socio-political complexity of societies. Examples of this approach include the works of Sumner (1911), Davie (1929), White (1949), Service (1962), and Otterbein (1970).

Most of these approaches are useful in looking at particular aspects of war. Most are also supported by some evidence, such as case studies of single societies and historical data. In evaluating them, however, it is important to remember that they address somewhat different theoretical issues.

Some of these approaches address issues that are not entirely relevant to explanations of war. For example, the innate aggression approach looks at the evolutionary question of the adaptiveness of

individual aggression but not the question of the adaptiveness of warfare, which involves groups. The diffusion approach identifies an important way in which warfare and practices associated with it spread from society to society but does not address questions about its origin and evolutionary significance.

In thinking about the possible causes of war, it is important to make the distinction between intergroup competition, a social behavior that exists in a variety of species, and warfare, a form of intergroup competition that depends upon culture and is unique to humans.

Intergroup competition is the struggle for reproductive resources that occurs between different groups of the same species. It does not include struggle between the individuals and groups of different species. It does not include competition between individuals of the same species (even if these individuals should happen to belong to different groups). And it does not include competition between an individual and a group of the same species.

Intergroup competition is a social behavior that has its own evolutionary history like other social behaviors, such as dominance. In those species that have the trait, with the exception of Homo sapiens, it appears to be non-cultural. It is appropriate, therefore, to use conventional methods of biological analysis to study its causes.

Warfare is a form of intergroup competition that involves the use of weapons. It is a cultural trait. Weapons are artifacts. They are transformations of the environment that are opportunistic responses to the problems posed by groups of hostile conspecifics.

There are good reasons to believe that natural selection has favored the spread of non-cultural traits that facilitate (but are not the cause of) the practice of warfare. As I argued in Chapter 2, some of these traits are common to all or nearly all primates and are evolutionarily conservative. Others are evolutionarily labile. They are distinctively expressed or unique to Homo sapiens. Their evolution is presumably attributable to the cultural activity of warfare.

It is necessary, therefore, to distinguish between the ultimate and the proximate causes of war. The ultimate causes are the evolutionary reasons for intergroup competition, and in the history of Homo sapiens, for the cultural practice of war. A focus on these causes raises questions about the evolution of intergroup competition. In what species does it exist? What conditions are associated with it? What are its functions as gauged by its consequences for individual inclusive fitness? The proximate causes are the immediate reasons for the cultural practice of warfare within particular geographical or historical contexts. A focus on these causes raises questions about war as a cultural trait and its incidence and variability across political communities.

Ultimate Causes of War

In looking at the ultimate causes of war, it is assumed that at some period in the evolution of Homo sapiens the individuals (groups) who practiced war enhanced their inclusive fitness. If this did not happen, war should not have existed in prehistory and should not exist (or should be disappearing) today. The only other logical

argument is that war is of recent origin. The weakness of this argument, as was indicated earlier, is that fairly good evidence exists of intra-specific killing with weapons throughout most of the paleolithic (Roper, 1969). It is reasonable to assume based upon the prominence of war in history, as well as in prehistory, as is apparent from archaeological data, that some of this killing was due to intergroup competition involving the use of weapons.

A focus upon ultimate causes leads to the general question of why war and other forms of intergroup competition exist at all. One approach to this question is the comparative method. It might be useful to look at intergroup competition in other species and identify conditions that engender it. If particular conditions are unambiguously associated with intergroup competition, in a wide range of species, these conditions are most probably the explanation of it.[1]

Among all the forms of competition that exist in nature, the most common is undoubtedly that which occurs between the individuals and groups of different species. Examples are predation and parasitism. Competition between individuals of the same species is also common. Some examples include scramble competition, social dominance, and territoriality.

Intergroup competition is not especially common. The major reason is that most species are solitary, which automatically precludes its possibility. Another reason is the primitive level of

---

[1] For example, the observation that sexual reproduction is uniformly associated with unpredictable environmental conditions is evidence enough to indicate that the purpose of sex is the production of diverse genomes with a greater likelihood of survival and reproduction in unpredictable environments.

sociality that exists in those species which do live in groups. A school of small fish may inadvertently compete with other schools for places to hide or for food, but when it does this, it is not a result of the coordinated actions of fish within the school to deprive the access of other schools to these resources but rather the incidental consequence of individual fish competing with each other for resources.

Since intergroup competition presupposes coordinated action by members of a group against another group of hostile conspecifics, it is restricted to species which are "highly" social. It occurs among some of the more highly subsocial species (e.g., hyenas, wild dogs, wolves, baboons) and among some eusocial species (e.g., some ants).

Although nobody has conducted a systematic comparative analysis, it is apparent that intergroup competition occurs most commonly in the context of territoriality. This takes a variety of forms: the patrolling of boundaries (chimpanzees), the marking of boundaries (hyenas, wild dogs), signalling location (wolves), guarding and fortifying nests (ants), threatening other groups (hyenas, baboons, chimpanzees), and attacking (ants, hyenas, baboons, chimpanzees). The usual cause of such territoriality is that a resource such as food, water, a nesting site, or females exists that is valuable and sufficiently concentrated so that it can be defended.

Thus, it would seem that intergroup competition involving territoriality appears under a variety of conditions and for a variety of purposes. It is not associated unambiguously with a particular condition and purpose. Like many other social behaviors,

intergroup competition is an opportunistic response. In thinking

about the ultimate causes of warfare in humans, therefore, there may

be no single answer, since warfare may have had multiple functions

and these may have depended upon the particular time and context.

The intergroup interactions of the primates are of particular

interest because of their possible relevance to explanations of the

evolution of intergroup competition in homo sapiens. Jane Goodall

et al. (1979:17) have identified six types of interactions between

groups that have been observed in the primates: chance encounters

while groups are travelling or foraging, competition over a food

source in an overlap zone, encounters at water holes or sleeping

sites, encounters while on boundary patrols, raids or invasions by

males attempting to drive out the leader male of another group or

to herd or lead away females from the group, and transfer encounters,

when one or several individuals try to join a neighboring group.

Although Goodall et al. (1979:14) note that intergroup inter-

actions of primates are sometimes peaceable, they quite often involve

substantial tension, as evidenced by vigilence, glares, and threats.

Occasionally, in most primates, interactions involve overt hostilities,

including chases and attacks. In most instances, the cause of overt

hostilities is either a food source or females.

The research conducted by Goodall and her colleagues of inter-

actions between communities of chimpanzees in Gombe National Park

in Tanzania was unable to reach any firm conclusions about the causes

of overt hostilities. Some of these hostilities involved particularly

brutal gang attacks upon single members, both male and female, of

other communities (1979:38-41). One possibility is that habitat

destruction due to extensive cultivation outside the boundaries of the park, in conjunction with population growth, led to food shortages and intensified territoriality. The reproductive success of males within a particular community may depend to some extent upon the size of its territory (or home range) since larger territories would have the food resources to sustain a larger number of females and offspring.

It may be useful to return to the evolutionary idea that warfare exists and takes its various forms because it is an important cultural trait that enhances the inclusive fitnesses of the individuals and groups that practice it. If this is true, warfare should exist, like other social behaviors, because it helps individuals (and groups) to combat one or more of Darwin's hostile forces.

The evidence on intergroup competiton in the primates and especially in chimpanzees suggests three likely candidates among these hostile forces as the initial causes of warfare. These forces are groups of hostile conspecifics, food shortages or their causes (e.g., population growth), and shortages of women or their causes (e.g., polygyny, local imbalances in sex ratios). The existence of one or more of these would seem to be a necessary condition for the emergence of warfare between humans.

A number of scientists have suggested that food shortages were the original cause of intergroup conflict between human or proto-human groups and that these resulted in cannibalism (Coon, 1962; Dart, 1949). The rationale for this hypothesis is that cannibalism would have been an effective means of securing protein and of eliminating conspecific competitors. Although the argument seems plausible, it is deficient in at least one respect.

The major difficulty is that selection of a well-armed, organized, and intelligent species such as Homo sapiens as prey would be extraordinarily dangerous (see Alexander, 1971). It would be easier to select as prey those species that yielded the most protein for the least amount of danger and effort. As a solution to the problem of food shortages, therefore, cannibalism is likely to occur only when there is little or no non-Homo sapiens prey. It would occur for opportunistic reasons as it does in other carnivores. For example, cannibalism by male lions, which involves the killing and eating of cubs, seems to be an incidental consequence of taking over a pride.

It seems plausible that cannibalism is an incidental advantage of war, existing in some contexts but not in others, and that the major advantage of war is linked with some other hostile force. The practice of cannibalism by the Aztecs, for example, appears to have been an incidental advantage of their wars of conquest but not their main purpose. Other reasons, such as tribute and defense, seem much more plausible (cf., Harris, 1977).

Other evidence suggests that cannibalism occurs only in special contexts and was not a likely cause of war among early humans. One piece of evidence is that cannibalism is not universal among simple societies. Another piece of evidence is the abhorrence of cannibalism by many societies. It is also noteworthy that cannibalism, unlike predation upon other species, is often associated with special ceremonial practices, suggesting that it occurs only rarely, and when it does, is of unusual societal significance.

The most widespread view among anthropologists, perhaps, is that warfare exists and takes its various forms for economic reasons

(Durham, 1976; Dyson-Hudson, 1978; Service, 1962). Warfare was an
effective way for groups of humans to secure resources such as cat-
tle, food, land, weapons, slaves, and other plunder. A group that
was successful in warfare would enhance its stock of resources
at the expense of other groups. These resources would facilitate the
well-being and reproductive success of group members.

Although warfare is an unusually dangerous form of competi-
tion and should be less likely to occur because of this, it is
useful to recall the ecological principle that competition tends to
be most intense between individuals (and presumably also, groups)
of the same species who occupy the same niche. Thus, warfare may
exist simply because in particular contexts it was the most
effective means that humans had to compete with other humans for
resources. Other means of competition would have become less ef-
fective once human groups became armed and capable of cooperation.

Assuming that economic reasons were the cause of the emergence
and persistence of warfare, it would be useful to know which
resources were at stake or critical. It would also help to know why
warfare rather than some other means of competition was an effec-
tive means of competing for such resources.

It would seem that the most likely critical resources throughout
much of human evolutionary history were women and food. In a
moderately polygynous species such as humans the reproductive
success of males depends upon success in acquiring women as mates.
It also depends, however, upon success in securing food, and
especially protein, because of the effects of protein upon the
fertility and health of mates and offspring. To the extent that

other resources were critical, it seems likely that this was because of their linkages to women and food.

Shortages of women as a cause of warfare over much of human evolutionary history seems plausible based upon the relatively high incidence of conflict over women that exists in historically observed simple societies (Chagnon, 1979a,1979b; Fried, 1967; Symons, 1979). Such conflict is aggravated by polygyny. The greater the degree of polygyny, the more men who do not have wives, and thus, the greater the potential for conflict.

The previously mentioned studies by Chagnon (1979a,1979b) of the Yanomamö show that polygyny leads to conflict both within and between villages. Sources of conflict within villages include adultery and manipulated exchanges of women. This conflict is most intense within large villages in which genealogical relationships are less close and options for acquiring women more numerous. It can break out into fighting that in some instances leads to village fissioning. Conflict between villages involves the formation of alliances, the fusion of weak villages with stronger ones, chronic raiding to abduct women and to retaliate for enemy raids, and migration of villages to peripheral and less populous areas.

Aside from polygyny, shortages of women can also result from local imbalances in sex ratios (Chagnon, 1979b:100). These imbalances would be a source of conflict whenever they made reciprocal exchanges of women between groups difficult or impossible. For example, a hunter-gatherer band in which there were many unmarried men, but few or no marriageable women, might find it difficult to arrange marriages, especially if neighboring bands also had an excess of unmarried men.

It would seem that demographic imbalances of this sort would be a constant source of friction between the small political communities characteristic of most of cultural history.

Another possible cause of warfare over much of human evolutionary history is food shortages. Many of the foods eaten by hunter-gatherer peoples, especially animals, vary in quality and are distributed unevenly. It is not unusual to find environments that are rich in edible plant and animal life alongside those that are poor in these resources. In North America, for example, the Sierra Nevada range divided the rich environments of the foothills and marshes from the impoverished desert plateau to the east. A concentration of food resources would encourage competition between human groups, especially as groups became more numerous and migration was precluded as an easy and obvious solution.

If shortages of women and food were important causes of warfare in human evolutionary history, they (or causes linked to them) should also be important causes of warfare in simple political communities that more nearly resemble the types of groups that existed for much of cultural history. To test this idea, I gathered information on the relative incidence of various proximate causes of warfare in the sample societies. Those causes with a presumptive linkage to shortages of women and food should be especially common in societies with uncentralized political communities.

Proximate Causes of War

Proximate causes of warfare include all of the immediate reasons that political communities go to war. In general, these reasons can

all be classified into four categories: political, prestige, economic, and defense/revenge (see Otterbein, 1970).

For this analysis, I will use more detailed breakdowns and will identify 11 different reasons for war within these four categories. The category political reasons includes four types of conquest and subjugation: dynastic incorporation, administrative incorporation, indirect control, and autonomy and tribute. Warfare for dynastic incorporation occurs whenever an individual or kin group initiates war for the purpose of seizing control of a political community and establishing themselves and kin in office. Warfare for administrative incorporation occurs whenever a political community initiates war for the purpose of establishing direct administrative control at the district level or lower over defeated political communities. Warfare for indirect control occurs whenever a political community initiates war for the purpose of establishing administrative control at the provincial level or higher over defeated political communities. Warfare for autonomy and tribute occurs whenever a political community initiates war to establish its military dominance over other political communities and to collect tribute from them (although it does not establish administrative control).

The category economic reasons is very broad and includes four types of resources: land, material plunder, women, and captives. The economic uses of land include agriculture, hunting, and grazing. In some societies, land is valuable because of its geographical location and its advantages in transport or because of its mineral wealth. Material plunder includes domesticated animals such as camels, cattle, pigs, and horses. It includes weapons. It includes

foodstuffs, such as storehouses of grain, and it includes luxury goods.

Women taken captive are used as artisans, gardeners, household servants, and as concubines or wives. Men taken captive are used or sold as slaves.

Captives are also used for what appear to be non-economic uses. Examples include their use as hostages, as sacrificial victims, or for cannibalism. These should perhaps best be categorized as revenge or prestige reasons but are included among the economic reasons because of the difficulty of distinguishing, in many cases, the uses to which captives were put.

Prestige reasons include all of the non-economic benefits that accrue to warriors from successful military action such as honor bestowed by the political community, insignia, titles, promotions, and special privileges. These benefits may also accrue to their wives and families.

Defensive reasons include both reasons of revenge (or retaliation) and defense. Warfare for revenge exists whenever a political community takes military action because it is attacked by another political community. It also exists whenever a political community takes military action because of delicts such as murder or rape perpetrated by a member or members of another political community. Warfare for reasons of defense occurs whenever a political community takes military action to protect its population, property, and territory. It also occurs whenever a political community takes military action to preserve its autonomy. For example, military action to resist attempts by another political community to impose tribute or to cut off a trade route is defensive warfare.

In looking at the proximate causes of warfare, it is important
to recognize that there are both private (at the level of the indi-
vidual and kin group) and public (at the level of the political commun-
ity) reasons for engaging in war. These may or may not be identical.
In simple political communities, which often lack an official with
the authority to control the actions of warriors, public reasons for
engaging in war are typically little more than the sum of all of the
various private reasons that exist. In coding for the proximate causes
of war, I coded all of the public reasons that existed. I considered
all political reasons to be public by definition. I considered econ-
omic reasons and prestige reasons to be public ones if they were held
by officials or by a substantial proportion of warriors. I considered
all defensive reasons to be public ones unless they were clearly
linked with individual or kin group acts of feud and retaliation.

Table 4.1 shows the incidence of the proximate reasons for war in
the sample societies. I present percentages for external war, internal
war, and civil war.

External war is war waged between political communities of dif-
ferent societies. A society generally corresponds to a population
in the sense that biologists use this word. It is a group of inter-
breeding individuals. In humans, these groups are typically distin-
guishable from others by cultural differences, such as language. Inter-
nal war is war waged between political communities of the same society.
In some societies, with only a single political community, internal
war is absent by definition. Civil war is war waged within political
communities. Typically, it involves conflicts between military units
controlled by incumbent political officials at the highest territorial

Table 4.1:   Reasons for Warfare

	External War (%)	Internal War (%)	Civil War (%)
Political Reasons:			
subjugation and tribute—dynastic incorporation	10	17	80
subjugation and tribute—administrative incorporation	6	4	10
subjugation and tribute—indirect control	2	0	10
subjugation and tribute—autonomy and tribute	10	0	20
Economic Reasons:			
land—for fields, hunting, grazing	33	44	20
material plunder—weapons, animals	63	52	40
capture of women for use as concubines/wives	39	52	10
men/women captives for use as hostages/slaves, sacrificial victims, or cannibalism	57	44	20
Prestige Reasons:			
trophies—honors, titles, prestige	41	30	10
Defensive Reasons:			
revenge or retaliation	48	74	30
defense	80	57	90
	N= 49	N= 23	N= 10

level and units controlled by officials at lower territorial levels

or by other challengers. In some political communities, with only one

or two territorial levels, conflicts within political communities

involve kin groups. These conflicts are called feuds to distinguish

them from civil wars which occur on a larger scale.

The incidence of different reasons for war should in large part

reflect the predominance within my sample of societies with simple

political communities. Those reasons believed to be characteristic

of early human groups—revenge/defense, food shortages, and shortages

of women—should be common. Those that are characteristic of com-

plex political communities—the various types of conquest and subju-

gation—should be much less common.

Looking first at external war, Table 4.1 shows that revenge/

defense reasons were the most common. Economic reasons were the

second most common, prestige reasons were third, and political

reasons fourth.

Among the various economic reasons, material plunder (63 percent

of societies) was the most common. Generally, material plunder refers

to cattle, an important source of protein in many societies. The

second most common economic reason was captives (57 percent). These

were used most often as slaves (16 societies) but also as hostages

(4 societies), for cannibalism (4 societies), and as sacrificial vic-

tims (2 societies). Among these uses, the only one that is clearly

an economic reason is the use of captives as slaves. The other uses

should probably be coded as defensive reasons because they would seem

to be an effective way of intimidating the enemy. An enemy may be

afraid of attacking if he risks being tortured, cooked, and eaten. If

these uses are coded as defensive reasons, 33 percent of societies had political communities that waged external war for captives.

The third most common economic reason (or second, if the uses of captives are recoded) was the capture of women for use as concubines/wives (39 percent of societies). Obviously, this is also a reproductive reason for war. The least common economic reason was securing land for fields, hunting, and grazing (33 percent of societies).

The percentages for internal war, for the most part, parallel those of external war. There were some differences but these are difficult to interpret because of the small number of societies with internal war. Dynastic incorporation, land, the capture of women, and revenge were somewhat more common reasons for internal than for external war. Autonomy and tribute, material plunder, captives, trophies, and defense were less common reasons.

The percentages for civil war, although based on only 10 societies, suggest the overwhelming importance of political reasons, especially dynastic incorporation, and defensive reasons (i.e., defense of the existing political community from those threatening it from within).

These results suggest several things about war and its ultimate causes. First, the high incidence of economic reasons linked with food shortages (land, plunder of cattle and other food) and with shortages of women (capture of women) supports my hypothesis that these hostile forces were the likely cause of warfare in early human societies. If this were not true, the incidence of these reasons should have been somewhat less since simple political communities were

so common in my sample.

Second, the high incidence of defensive reasons supports
Richard Alexander's balance-of-power hypothesis. A political community
that is attacked by its enemies will retaliate. The failure to do so
shows weakness and an imbalance of military power. Officials should
be intensely concerned with this because their own positions (and
perhaps their lives) depend upon successfully defending their politi-
cal community. The historian Michael Howard (1982) has argued
that many wars in history are traceable to imbalances of power (or
perceived imbalances) and the preoccupation of political officials
with restoring those balances. Of utmost concern to officials is the
autonomy of their political communities. Are they able to act with-
out restraint in international affairs? The growing military power
of adversaries (or potential adversaries) threatens this autonomy.

Political Centralization and Reasons for War

One of the most significant things about warfare and its history
is that the reasons for it have increased in number. This trend is
directly associated with the appearance of increasingly complex
(or centralized) political communities.

Cross-cultural studies by Naroll (1966) and by Otterbein (1970)
have shown that simple (or uncentralized) political communities,
typically identified as bands and tribes, generally have fewer reas-
ons for going to war than do complex political communities, typically
identified as chiefdoms and states.

In uncentralized political communities the most common reason
for war is revenge/defense. Various economic reasons are somewhat less
common. Prestige reasons are uncommon. Political reasons are generally

absent.

Defense/revenge reasons seem to presuppose the existence of other reasons for war. These other reasons, however, are those held by enemies. Although these reasons vary, there is little evidence to indicate that there have ever been many societies that have been so fortunate as to lack enemies because there were no reasons to attack them. In my sample, only four societies, the Dorobo, Baiga, Manihikians, and Tewa, were not attacked. Two of these, the Dorobo and Manihikians, were isolated from other societies. The remaining two societies had lost their autonomy and were not attacked because they were defended by powerful, alien political communities.

In centralized political communities the most common reason for war is also revenge/defense. Various economic reasons are somewhat less common. Unlike uncentralized political communities, however, prestige and political reasons are more common. Since centralized political communities are evolutionarily more recent in the sense that they appeared after uncentralized ones, it is legitimate to think of defense/revenge and economic reasons as being more primitive reasons for war than prestige and political reasons.

The study by Otterbein (1970) shows this by using a Guttman type scale. He found that where political reasons for war exist, prestige reasons generally exist. Where prestige reasons exist, economic reasons exist, and where economic reasons exist, revenge/defense reasons exist. Thus, if his scale indicates evolutionary stages, the most primitive reason for war is revenge/defense, followed in order by economic, prestige, and political reasons.

A possible explanation for such evolutionary stages is that

primitive reasons for war are necessary conditions for advanced ones.
A political community that did not wage war for reasons of revenge/
defense would have little prospect of survival. A political community
that did not wage war for economic reasons would not secure the advan-
tages that derive from the capture of land, plunder, and captives and
presumably would have little to gain from waging war for prestige.
A political community that did not wage war for prestige would pre-
sumably find it difficult to motivate individual warriors to engage
in military actions with political objectives in which their own
personal stake was small.

I will use my own data to replicate Otterbein's scale. I include
reasons for external, internal, and civil war since there is no reason
to distinguish between these types in constructing the scale.

Table 4.2 shows both the scale and non-scale patterns and the
societies associated with each of these patterns. An "x" indicates
that a reason was present, a "o" indicates that it was absent.

I looked more closely at a number of societies that fit into non-
scale patterns to see if there was an obvious explanation for deviancy.
This resulted in a number of changes in classification. I moved
two societies--the Kuba and Songhai--from non-scale pattern #8 to
scale pattern #5 because it was evident to me that historical accounts
of warfare in these societies, because of the early focal dates, would
be unlikely to mention prestige as a reason for war. I moved one
society--Iran--from non-scale pattern #8 to scale pattern #5 since it
seemed that prestige was a reason for war in Iran, as it is in all
Islamic countries, even though I did not find any explicit mention of
this. It is possible that several other societies that have non-scale

Table 4.2:   Reasons for Warfare Scale

scale patterns				societies	#
politi-cal	pres-tige	econom-ic	de-fense		
#1 o	o	o	o	Dorobo, Selung, Baiga* (British), Manihikians, Tewa* (United States)	5
#2 o	o	o	x	Cebu* (United States)	1
#3 o	o	x	x	Luguru, Guro, Babwa, Lugbara, Iraqw, Jur, Dinka, Aua, Sivokakmeit, Koita, Tasmanians, Wukchumni, Tachi, Atsugewi Tehuelche, Goajiro, Chichimec	17
#4 o	x	x	x	Bunda, Garo, Chechen, Purari, Mailu, Kapauku, San Juan, Wichita, Bungi, Winnebago, Bohogue, Kiowa, Northern Saulteaux, Botocudo, Pima	15
#5 x	x	x	x	Nama, Kuba, Songhai, Iranians, Madan, Gujarati, Tongans, Jemez* (Spanish), Inca, Aztec, Zuni* (Spanish)	11
subtotal				(84%)	49

non-scale patterns					
#6 o	x	o	x	Konso	1
#7 x	o	o	x	Okinawans, Mogh* (British)	2
#8 x	o	x	x	Luvale, Thonga, Gogo, Falasha* (Amhara), Ahaggaren, Siamese	6
subtotal				(16%)	9
no information				Banyun, Sara	
Total				(100%)	58

patterns are improperly classified due to a limited amount of informa-
tion on warfare (Luvale, Falasha, Konso, Okinawans).

Societies without fully autonomous political communities are
asterisked so that they can be distinguished from others. In these
societies sovereignty in military activities resides in the political
community that is the colonial power. For example, the Mogh were sub-
ject to the indirect rule of the British before Indian independence.
Although the Mogh allied with the British to conquer and subjugate the
Kuki, a group of hill tribes that harassed them, they did not do this
by themselves. Military sovereignty in this case clearly resided
with the British. In societies that were not autonomous, therefore,
reasons for warfare are generally those of the colonial power. To
avoid any confusion, I have included the names of these colonial pow-
ers in parentheses.

I have also, to be consistent with Otterbein's method, assumed
that defense/revenge is a reason for war in every society with
political communities that engaged in war (see my discussion above).
In many societies, evidence that defense/revenge is a reason for war
is indirect, such as the existence of defensive fortifications,
rather than direct, such as evidence of retaliation after an attack,
and is therefore difficult to detect. Also, it is apparent that
ethnographic accounts contain much richer description of offensive
than of defensive military actions, perhaps because of the reluctance
of people to talk about instances in which their political communities
were attacked and defeated.

Table 4.2 displays the scale and shows that the large majority
of societies (84 percent) did have reasons for war that fit into one

or the other of the scale patterns. It is apparent in looking at the societies that are associated with each scale pattern that central-ized political communities engage in war for more reasons than uncen-tralized ones. For example, in scale pattern #5, in which political reasons exist for war, all of the societies have political communities (or are subject to the authority of political communities, where there is a colonial power) with three or more territorial levels, with the single exception of the Madan. In scale pattern #3, in which only economic reasons and revenge/defense reasons exist for war, all of the societies have political communities with only one or two terri-torial levels.

The most common non-scale pattern was #8 in which political, economic, and revenge/defense reasons exist but prestige is absent. It was difficult to determine, however, whether the six societies that fit this non-scale pattern were genuinely deviant or not. It is arguable, for example, that prestige was a reason for war among the Ahaggaren since warriors in that society occupied the uppermost position in a caste system. In one society, the Siamese, prestige was not a reason. This society was genuinely deviant. There appears to be no explanation for this except the general revulsion by Siamese culture against everything military. Much of this may have been due to a history of civil wars caused by dynastic disputes in which ordin-ary citizens and warriors had little or no stake.

That the large majority of societies did fit scale patterns is consistent with Naroll's and Otterbein's results and replicates their findings. It is clear that centralized political communities have more reasons for engaging in war than do uncentralized ones. This is of

great theoretical interest because political reasons are linked with
centralized political communities in a way that suggests they may be
a necessary condition for their emergence.

CHAPTER 5

MILITARY PRACTICES

In this chapter I look at military practices. These include aspects of culture directly connected to the organization and conduct of warfare: military sovereignty, weapons, tactical systems, military units and their recruitment, composition, training, organization, and discipline, methods of protection including armor and defensive preparations, and military strategy.

Military practices vary in their effectiveness. Those that are effective do one or more of the following: lessen damages and losses to property, population, and territory from enemy attacks, deter enemy attacks, or increase the chances of defeating the enemy in battle.

A political community that uses more effective military practices than its competitors enhances its relative prospects of survival and growth. As I argued in Chapter 3, its cultural traits are likely to spread and increase in frequency.

If effective military practices are linked with particular political structures, those structures should have the greatest chance of survival in a competitive milieu and should be more common than other structures. This should explain, at least in part, why certain political structures exist today and not others.

The causal relationships between military practices and political structures are most likely complex. Military practices may be the

cause of political structures. An example is the formation of the Zulu state (see Chapter 3) in which the adoption of the short, stabbing spear and new tactical formations made possible the conquest and incorporation of defeated tribes.

Alternatively, political structures may be the cause of military practices. An example is the Inca state. The successes of this state in augmenting the population and territory under its control enabled it to use these resources for military purposes. Conquered populations were used as corvée labor to farm state lands, build roads for the movement of troops and material, and construct military garrisons and warehouses. The need for such military actions was presumably a consequence of the defensive problems (and offensive opportunities) that new conquests engendered.

Military practices are linked with the prospects of survival and growth of political communities. For this reason they are not irrelevant to individual survival and reproduction. The inclusive fitness of individuals is tied, at least in part, to the military success of their political communities.

The argument that natural selection due to warfare has been important if not pivotal in the evolution of human traits implies that genes exist which facilitate military practices associated with warfare. This would be true of today unless we were prepared to argue that environmental novelty has fundamentally changed the nature of warfare.

As I showed in the previous chapter, however, the causes of warfare, rather than changing, have only become more numerous. The modern warrior, no less than his primitive counterpart, goes to war to

defend himself, his family, and his political community.

In a competitive milieu, military practices are the sine qua non of culture. They have a direct impact upon the prospects of survival and growth of political communities and their cultural traits. The potential for military practices to have these widespread effects upon the direction and tempo of cultural evolution is of great theoretical interest. The causes of variation in the effectiveness of military practices across political communities are also the causes of variation in other aspects of culture.

Military Practices and Their Effectiveness

The study of military practices and their effectiveness is probably as old as warfare itself. Much that is "known" about military practices, however, is anecdotal and historical rather than comparative and ahistorical. The subject, therefore, is much less of a science than is generally supposed.

The major problem is methodological -- finding a way to assess military practices that is appropriate and feasible. There are a number of approaches to this problem. None is entirely satisfactory.

One approach is to look at the incidence of different military practices. A practice that is in widespread use is presumably more effective in warfare than one that is not and became so because of its effectiveness. Although this should be true in general, there have been instances in history when a military practice in widespread use was actually less effective than one that was not. An example is the bow and arrow. Although this weapon was less effective than firearms, it remained in widespread use until the 19th century.

Many societies lacked the resources and technology to construct fire-
arms and could only obtain them from other societies.

A more sophisticated version of this approach is to look at changes
in the incidence of different military practices. The frequency of an
effective military practice should increase over time; the frequency
of an ineffective one should decrease. Although this should also be
true in general, there have been occasional instances in history when
it was not. For example, the increased incidence of cumbersome armor
and heavy swords during the Middle Ages seems to have been a change
that was more ornamental than functional.

This approach is difficult to use in cross-cultural studies since
there is typically little or no information on changes in the incidence
of different military practices over time. A possible solution to this
problem (see Otterbein, 1970) is to contrast the military practices of
centralized with those of uncentralized political communities under
the presumption that those which are effective will exist in dispro-
portionate frequency in the former. This should be true if selection
due to warfare is more intense in centralized than in uncentralized
political communities.

Another possible approach is to look at the actual effectiveness
of military practices in lessening damages and losses from enemy at-
tacks, deterring enemy attacks, or increasing the chances of defeat-
ing the enemy in battle. This approach would seem to be useful in
identifying the actual functions of specific military practices. For
example, large military units might deter enemy attacks, they might
make it easier to defeat the enemy, or they might do both of these
things.

A problem with this approach, in my study, is a lack of data. There are little data on damages and losses suffered from enemy attacks. There are some but not much data on the frequency of enemy attacks, a measure of deterrence. The same is true of enemy and friendly casualties which are measures of battlefield success.

An alternative to these measures of effectiveness is the strategic success of military units as measured by changes in the territory and/ or autonomy of their political communities. Military action is a strategic success when it enhances a political community's prospects of survival and growth. This would seem to be true in situations when military action results in gains in territory/autonomy. It would also seem to be true, but to a lesser extent, when military action is inconclusive and gains in territory/autonomy are matched by losses, or when territory/autonomy remains stationary. Military action is a strategic failure when it does not enhance prospects of survival and growth, as when military action results in losses of territory/autonomy.

A problem with this approach is that it is difficult to know which military practice (or practices) are critical to strategic success and which are not. For example, shock weapons are probably more critical to strategic success than armor (Otterbein, 1970). Another problem is that a military practice may be an effective defensive measure only if it is combined with other practices. For example, the building of walls or trenches around residential sites is an effective defensive measure only if guards are also posted. These problems suggest that it might be appropriate to use multivariate statistical methods. This is difficult to do in my study, however, because of a small sample and missing data.

Another problem with this approach is that success in warfare depends upon the military practices of the enemy. The use of a large number of effective military practices will be of little avail if the enemy uses a larger number of them.

The method that I will follow is to use several of these approaches. First, I will look at the incidence of different military practices in the political communities of the sample societies. Second, I will look at military practices and their impact on changes in territory/autonomy.

I gathered information on the incidence of military practices in seven different areas. Many of these practices have already been studied by Keith Otterbein in his book The Evolution of War (1970). He provides an excellent overview of their advantages and disadvantages. In regard to some practices, therefore, I will provide only capsule summaries of his arguments.

My expectation is that those practices which are effective should be present in a high proportion of sample societies whereas those that are less effective should not. Unfortunately, with some military practices it was difficult to tell positively whether the practice was absent or not (since ethnographers simply noted its presence and not its absence). For these practices I simply show the number of societies in which the practice was indicated to be present.

In presenting my findings on the incidence of different military practices in the sample societies, I list practices in each category in the order of their presumed effectiveness. The basis for most of these judgments is Otterbein (1970). Turney-High (1949) also presents an excellent review of military practices. Another source is Andrzejewski (1954). For some military practices the appropriate order is

problematic and is based upon my own judgment. These I have asterisked.

I also gathered information on changes in territory/autonomy of the sample societies, a measure of strategic success. My expectation, identical to Otterbein's (1970), is that effective military practices should be associated with gains in territory/autonomy, whereas ineffective or less effective military practices should be associated with losses in territory/autonomy. Of course, it should be remembered that looking at bivariate relationships in this way is an oversimplification because the effectiveness of a military practice may depend upon the use of other practices or upon the practices of enemies. Nonetheless, the direction and strength of bivariate relationships probably does give some indication of the relative importance of military practices to strategic success. For example, if shock weapons were present in societies that gained territory/autonomy but absent in other societies, it is likely that shock weapons are important to strategic success.

To analyze these relationships, each military practice was recoded into two levels, one of which was hypothesized to be ineffective or less effective (=1) and the other more effective (=2). Changes in territory/autonomy were recoded into three levels: losses in territory/autonomy (=1), territory/autonomy stationary or breaking even (=2), and gains in territory/autonomy (=3). Since the variables are assumed to have ordinal properties, Goodman-Kruskal's gamma is used as a statistic to indicate the direction and strength of bivariate relationships. This statistic varies between +1 and -1. A positive value indicates that a military practice hypothesized to be effective was associated with gains in territory/autonomy in the sample societies. A negative value indicates the opposite and would not be consistent with my

hypothesis about the effectiveness of a military practice. The size of the absolute gamma gives an indication of the strength of a bivariate relationship. The larger this size, the stronger the relationship.

For some military practices there was insufficient information to conduct a statistical test. I did not calculate gammas for these categories. The following six sections present the results of this analysis.

Sovereignty

One of the most important aspects of warfare is the type of organizational structure that exists to determine military strategy. Who is the individual and/or group with final authority or sovereignty to initiate a particular defensive and/or offensive military action? According to military experts, it is best that a single individual have full authority to initiate military actions. This is particularly true of defensive actions where decisions must be taken quickly, and may also be true of offensive actions for the same reason.

Table 5.1 shows that the most prominent type of organizational structure in the sample societies in regard to both defensive and offensive actions was a single individual leader. With regard to sovereignty, therefore, the incidence of supposedly effective military practices was high.

Table 5.1 also shows that the gamma for defensive sovereignt: ₦ ₋s very large. This suggests that the type of political stru.. ⁻ᵉ ᵗ ₋ₜ exists is critical to the survival and growth of political comm·· ₋ies. There appears to be a strong bias that favors political structures in which single individuals hold military sovereignty; other

Table 5.1: Military Sovereignty

	Percent of Societies	Relationship with Changes in Territory/ Autonomy (gamma)
1. Defensive Sovereignty		
single authoritative leader who may be influenced by advisors	80	
single (or plural) executive and a council, assembly, or deliberative body	2	.71 ***
plural executive	5	(35)
council, assembly, or deliberative body	7	
no sovereignty	5	
	100	
	(41)	
2. Offensive Sovereignty		
single authoritative leader who may be influenced by advisors	48	
single (or plural) executive and a council, assembly, or deliberative body	10	.29 *
plural executive	5	(40)
council, assembly, or deliberative body	5	
other	2	
no sovereignty	31	
	100	
	(42)	
3. Internal Sovereignty		
single authoritative leader who may be influenced by advisors	76	
single (or plural) executive and a council, assembly, or deliberative body	5	a
council, assembly, or deliberative body	5	
no sovereignty	14	
	100	
	(21)	

Table 5.1: Military Sovereignty (continued)

*** p< .01   ** p< .05   * p< .10

a insufficient variation in independent variables (fewer than 5 cases in one of the categories of the independent variable)

Coding of Independent Variables:

1. Defensive Sovereignty
    1= no sovereignty; requires general consent (e.g., all of the warriors or people; council, assembly, or deliberative body with no single executive other than at best a presiding officer; single (or plural) executive and a deliberative body; plural executive, a committee
    2= single authoritative leader who may be influenced by advisors
2. Offensive Sovereignty (see codes for Defensive Sovereignty)
3. Internal Sovereignty (see codes for Defensive Sovereignty)

types of political structures are either difficult or impossible to sustain. I will look at final authority or sovereignty in much greater detail in Chapter 6.

Weapons

Another important aspect of warfare is weapons. Military experts distinguish between projectile and shock weapons. Projectile weapons are fired, hurled, or thrown at the enemy from a distance. Sometimes their principal use is in hunting. They accomplish several things in battle. They make it difficult for the enemy to advance or close. They also make it easier to advance or close upon the enemy and drive him from a position. Examples of projectile weapons include lances, throwing knives, rocks, bows and arrows, and rifles.

Shock weapons are used in close contact with the enemy. They accomplish the main objective in battle -- delivering a lethal blow to the enemy. Examples of shock weapons include the stabbing spear, the sword, and the bayonet. Shock weapons are specialized instruments and require training to use effectively.

Military experts agree that the most effective military practice is to use projectile and shock weapons in combination. In comparing the two, however, shock weapons are superior because they can be used to deliver a lethal blow to the enemy, eliminating any possibility of further resistance.

Table 5.2 shows that the majority of sample societies (70 percent) used both projectile and shock weapons, which is presumed to be the most effective military practice. The large gamma for shock weapons shows the possible importance of these to strategic success.

Table 5.2: Weapons

	Percent of Societies	Relationship with Changes in Territory/ Autonomy (gamma)
4. Shock Weapons		
present	70	
absent	30	.59 *
	100	(48)
	(48)	
5. Projectile Weapons		
present	97	
absent	4	a
	100	
	(57)	

*** p< .01   ** p< .05   * p< .10

a insufficient variation in independent variable (fewer than five cases in one of the categories of the independent variable)

Coding of Independent Variables:

4. Shock Weapons
    1= projectile weapons only
    2= shock weapons and projectile weapons
5. Projectile Weapons
    1= absent
    2= present

Tactics

Another important aspect of warfare is tactics. For military actions to accomplish their purpose, warriors must act in unison according to direction or plan (Otterbein, 1970). Tactical systems are of two general types: lines (which may include specialized units and coordinated actions) and ambushes (raids and traps). The purpose of the line is to prevent an enemy from concentrating his forces at a single point or on the flanks. If the enemy is allowed to do these things he can deliver superior projectile fire and shock at particular points, defeat friendly forces there, and fragment them so that they become even more vulnerable. The purpose of the ambush is to gain the advantage of surprise by attacking the enemy in a rush (the raid) or from concealed positions (the trap) so that he is unable to put up an effective defense.

The most effective tactic is to hold a flexible attitude toward surprise and select a formation that is best suited to the situation (Otterbein, 1970). For example, a military unit that insists upon surprise will be in danger if it is discovered by the enemy in the open but does not know how to fight in that situation.

Table 5.3 shows the incidence in the sample societies of the most complex type of tactical formation. It shows that ambushes, although presumably less effective, were more common. There are several possible reasons for this. First, perhaps, is the advantage of surprise, which is easier to obtain in the small military units characteristic of the simple political communities that are predominant in this sample. Second, it is likely that lines are less effective when there are only few warriors.

Table 5.3: Tactics

	Percent of Societies	Relationship with Changes in Territory/ Autonomy (gamma)
6. Tactical Systems (most complex type)		
specialized units and coordinated actions	2	
lines, shock weapons	17	
lines, projectile weapons only, cover	15	.34 *
lines, projectile weapons only, cover not used	13	(41)
ambush, surrounding the enemy, hit and run raid	48	
ambush, laying trap	4	
	100	
	(46)	
7. Duration of Offensive Campaigns		
long duration -- lasts more than one month	32	
medium duration -- lasts 8 to 30 days	12	.46
short duration -- lasts less than a week	18	(30)
very short duration -- a matter of hours, a single day	38	
	100	
	(34)	
8. Siege Operations		
present	26	
absent	74	.08
	100	(37)
	(38)	
9. Field Fortifications		
present	55	
absent	45	-.14
	100	(21)
	(22)	

Table 5.3: Tactics (continued)

*** p < .01   ** p < .05   * p < .10

Coding of Independent Variables:

6. Tactical Systems
     1= lines or ambushes
     2= lines and ambushes
7. Duration of Offensive Campaigns
     1= very short duration -- a matter of hours, a single day;
        short duration -- lasts less than a week
     2= medium duration -- lasts 8-30 days; long duration -- lasts
        more than a month
8. Siege Operations
     1= absent
     2= present
9. Field Fortifications
     1= absent
     2= present

The gamma for tactical systems (.34) indicates that the presumably most effective system, lines and ambushes, is positively associated with strategic success.

I also gathered data on other aspects of tactics. The ability to sustain a campaign is important since the length of time that a military unit is able to remain in action will affect its ability to successfully engage and defeat the enemy. As Table 5.3 shows, many of the sample societies (38 percent) had military units that conducted only brief campaigns, primarily because of simple methods of subsistence.

The inability to sustain a campaign sets limits upon strategic objectives. If military units are only able to conduct brief military actions, it will be impossible to attack the political communities of distant societies. A striking thing about the tactics of the few societies in the sample that were imperial powers (e.g., Songhai, Aztec, Inca) was the ability of their military units to conduct lengthy campaigns. The gamma for duration of campaigns (.46), although not statistically significant, suggests its linkage to strategic success.

There were only limited data on siege operations. The use of sieges allows a political community to increase its territory by capturing enemy villages (Otterbein, 1970) and should be positively associated with strategic success.

Table 5.3 shows that the use of sieges, a presumably effective military practice, was not especially common in the sample societies. There are probably two reasons for this. In some cases the enemy may not have fortified so that sieges would be unnecessary. In other cases military units may have been unable to conduct sieges because they lacked supply.

The gamma for siege operations (.08) was very small and not statistically significant, contrary to expectation. A possible explanation of this result is that political communities do not need sieges to defeat enemies who do not fortify.

Field fortifications include things like rock walls and trenches. They are used by military units to conceal the position and movement of warriors, to prevent surprise, to provide protection from enemy projectiles, and a place to retreat in case of defeat (Otterbein, 1970).

The few data that were available show that field fortifications existed in about half of the societies. The gamma for field fortifications was negative, which was contrary to expectation, but should probably not be viewed with great alarm since it was based on only 21 cases.

Military Units

Some of the most important aspects of warfare relate to the characteristics of military units -- composition, size, methods of recruitment, structure and degree of specialization, level of discipline, and methods of rewarding and punishing behavior.

With regard to composition, military units that contain professionals are superior to those that do not. Military units with professionals have among their members individuals who devote full time to training in tactics, weapons, and other aspects of war. Table 5.4 shows, however, that the military units of a majority of societies did not contain professionals (67 percent, although this figure would be somewhat lower if I had counted age grades and warrior societies as professionals). Many societies apparently did not have or were

Table 5.4: Military Units

	Percent of Societies	Relationship with Changes in Territory/ Autonomy (gamma)

10. Composition of Military Units

military units contain profession- als	28	
military units do not contain pro- fessionals	67	.41 **
no military units	6	(49)
	100	
	(54)	

11. Size of Military Units

over 1000	31	
101-1000	28	
30-100	10	.68 *
less than 30	31	(27)
	100	
	(29)	

12. Methods of Recruiting Non- Professionals*

all able bodied men	41	
draft	10	
age-grades	7	
kinship group	2	-.14
other methods	7	(38)
volunteers	33	
	100	
	(42)	

13. Number of Levels in Chain of Command*

four or more levels	14	
three levels	25	
two levels	50	.26
one level	11	(33)
	100	
	(36)	

Table 5.4: Military Units (continued)

14. Subordination within Military
     Units

high	56	
low	44	.06
	100	(32)
	(34)	

15. Rewards for Heroism*

material rewards	present in 10 societies	
status and prestige	present in 25 societies	
marital or sexual		b
privileges	present in 10 societies	
military promotions	present in 9 societies	

16. Cavalry

present	30	
absent	70	-.24
	100	(45)

17. Specialized Units (other than
     cavalry)*

scouts	present in 22 societies	
spies, intelligence	present in 12 societies	
communications	present in 14 societies	
naval (war boats, canoes)	present in 13 societies	
rear guards, covering		
troops	present in 10 societies	b
supply	present in 7 societies	
engineers	present in 4 societies	
medical	present in 5 societies	

*** p < .01   ** p < .05   * p < .10

b insufficient data

Coding of Independent Variables:

10. Composition of Military Units
     1= no professionals; no military units
     2= exclusive professionals; professionals and non-professionals
11. Size of Military Units
     1= less than 30 (platoon size, men from one residential site);
         30 to 100 (company size, men from several residential sites,
         district)

Table 5.4: Military Units (continued)

2= 101 to 1000 (battalion size, men from several districts,
    province, small chiefdom); more than 1000 (regimental size,
    full army, large chiefdom or state)
12. Methods of Protection
    1= volunteers; universal compulsory service based upon age-grades;
       selection by a kinship group
    2= levy or draft; all able bodied men
13. Number of Levels in Chain of Command
    1= one -- warriors' actions are not coordinated, they do as they
       please; two -- warriors receive orders from single field
       commander in full charge
    2= three -- three ranks; four -- four ranks; five -- five ranks
14. Subordination within Military Units
    1= low -- warriors often do not obey commands, may malinger or
       desert units, may take action on their own without notifying
       superiors when they should have
    2= high -- warriors obey commands, notify superiors of actions
15. Rewards for Heroism
    1= absent
    2= present
16. Cavalry
    1= absent
    2= present
17. Specialized Units (other than cavalry)
    1= absent
    2= present

unable to acquire the economic surpluses needed to maintain full-time professional warriors.

A possible advantage of full-time professional warriors is their value in deterring enemy attacks. In the sample societies, the existence of professionals was associated with a low frequency of enemy attack (gamma = .36, p < .05, N = 29).

The gamma for the composition of military units (.41) was moderately large and statistically significant. The strategic advantage of having professionals in military units may be a partial explanation of the types of political communities which exist today. The capacity to recruit, train, equip, and control professional warriors would seem to require a political structure that is authoritative, hierarchical, and permanent.

With regard to size, large military units (other things equal) are better than small ones. Large units have more projectile fire and shock, which makes it easier to concentrate force at a weak point in the enemy's lines or on his flanks. Table 5.4 shows that the size of military units varied greatly across the sample societies. The size of military units is limited by the population of the political community. If the population is small, military units tend to be small, and vice versa.

The gamma for size of military units (.68) was very large and statistically significant, indicating the strategic value of large military units. A more detailed analysis showed that political communities with large military units were attacked less frequently (gamma = .84, p < .01, N = 18), suggesting their value as a deterrent. Not surprisingly, large military units are also positively associated with

high enemy casualties. The advantages of large military units would seem to be a possible explanation of the large size of the political communities that exist today.

With regard to the recruitment of nonprofessionals, there is disagreement. One argument is that a political community should use a method of recruitment, such as service by all able-bodied men, that makes the military participation ratio (the proportion of the membership of the political community within military units) as high as possible. This would result in the largest possible military force and improve chances of defeating the enemy. Another argument is that quality matters more than quantity. There may be little advantage to a high military participation ratio if warriors are improperly equipped and trained. A method of recruitment such as the draft, age-grades, or reliance upon volunteers results in a smaller but more effective military force.

Table 5.4 shows that the most common methods of recruitment of nonprofessionals were the service of all able-bodied men and volunteers. The value of gamma (-.14) was negative, small, and not statistically significant. My hypothesis that two methods of recruitment were more effective than others -- the draft, and service by all able-bodied men -- was not supported.

Among the more important characteristics of military units are their structure, discipline, and degree of specialization. All modern armed forces have a hierarchical structure in which sub-units are joined together and linked from top to bottom by a chain of command. The advantage of this structure is that authority is relatively clear-cut both within and between hierarchical levels. This is especially

important in large military units. It would be impossible for the warriors in such units to act in unison if there were no clear-cut authority at the top of the structure and if orders given at the top could not be transmitted quickly to lower levels without interference. Table 5.4 shows that military units in a large proportion of the sample societies (89 percent) were structured hierarchically with a distinct chain of command.

Another characteristic of military units is their degree of discipline. If warriors cannot or will not obey the orders of their commanders, they will find it difficult to act in unison (Otterbein, 1970). Table 5.4 shows that a high majority of the sample societies (56 percent) had military units with high discipline. Since this percentage is higher than the percentage of societies with professionals in military units, it is apparent that the existence of professionals is not a necessary condition for high discipline (see Otterbein, 1970). This is probably because the exigencies of warfare simply require high discipline within military units.

Nevertheless, a substantial proportion of societies (44 percent) had military units with low discipline. Apparently, despite the importance of high discipline, it is difficult to achieve. There are probably several reasons for this. To some extent, low discipline may be due to inadequate training or experience. A nonprofessional warrior may have little stake in the success of a military unit if he is only a temporary member or if following orders will endanger his life. Also, a nonprofessional warrior without experience may be unaware of the importance of warriors acting in unison to the success of the military unit (as well as to the safety of himself and others within the unit).

The gamma for subordination within military units (.06) was surprisingly small and not significant. There seems to be no explanation for this anomaly except that military units that have low discipline may be more likely to engage an enemy with low discipline, or vice versa.

Many political communities use incentives to insure discipline within military units. The most common incentives seem to be rewards for heroism in the forms of enhanced status and prestige, special titles, insignia, dress, or other ornamentation. Material rewards, marital and sexual privileges, and military promotions seem to be somewhat less common.

Many political communities also use punishment to insure discipline. What little data exist suggest that the severity of the discipline varies greatly, from mild forms of ridicule to death (probably uncommon except in complex political communities).

It would seem that discipline would be an especially serious problem in the military units of political communities that wage war for political reasons since to warriors these reasons may matter little or nothing. To insure discipline, military units need to use very elaborate sets of incentives and punishments. The United States Army, with its promotions, awards, incentive payments, officer privileges, and the Uniform Code of Military Justice, is an example.

Another characteristic of military units is their specialized units. Such units exist in the armed forces of all modern nation states. They have also existed, but less commonly, in simple political communities.

Among the more important of these units is the cavalry (e.g.,

camel, horse, elephant, armored). The advantages of the cavalry are that it permits reconnaissance work, the quick movement of military units to and from the battlefield, the use of heavy armor, the concentration of forces on the enemy's flanks or at a weak point in his lines, the effect of shock, and the rapid pursuit of the defeated (see Otterbein, 1970).

Table 5.4 shows that cavalry existed in only 30 percent of the sample societies. The reasons for this low incidence include the high cost of maintaining cavalry as well as the ineffectiveness of cavalry in some environments (e.g., polar regions, thick forests, mountainous regions). The gamma for cavalry (-.24) was negative and inconsistent with the hypothesis of a strategic advantage. The source of this anomaly may be sampling error -- the presence in my sample of a number of simple political communities with warriors that fought from horses but did not use the tactics of conventional cavalry (e.g., Goajiro, Nama, Chechen, Tehuelche).

Among the most important of the specialized units are scouts, spies, and other units with intelligence functions. These units prevent (or facilitate) surprise, a major advantage in warfare (see Turney-High, 1949). Table 5.4 shows that scouts and spies are probably somewhat more common than other specialized units.

The advantages of other specialized units are fairly transparent. Communications units (e.g., runners, war drums) facilitate and speed the flow of orders within the chain of command, especially for mobilization in the event of enemy attack. Naval units increase mobility, both in attack and retreat, and in some circumstances (e.g., war canoes, submarines) make it possible to surprise the enemy. Rear

guards prevent surprise during ambushes and increase safety in retreat. Supply units enable military units to conduct longer campaigns using heavier and more effective weapons and methods of protection. Engineer units construct roads, bridges, and harbors, improving mobility and supply, and construct fortifications, improving defenses. Medical units improve the health and fighting capabilities of sick, injured, and wounded warriors.

Methods of Protection

Another aspect of warfare is methods of personal protection such as shields and armor. Shields prevent injuries by deflecting enemy projectiles and absorbing the impact of shock weapons. Armor does the same thing. A shield is easier to construct than armor, which must be properly fitted (Otterbein, 1970). Military experts generally agree that armor, which can cover vital parts of the body and which frees the hands, is better protection than a shield. However, armor can also be cumbersome and thus reduce mobility.

Table 5.5 shows that a larger proportion of the sample societies used shields rather than armor despite the superiority of armor. This is due at least in part to the technological difficulty of manufacturing armor (Otterbein, 1970). A modern example is the protective mask which is standard issue only in the best equipped armed forces.

The gamma for personal protection (.43) was moderately high, consistent with my hypothesis, but not statistically significant. In any case, methods of personal protection may be of only limited importance to the success of military units (Turney-High, 1949).

Another aspect of warfare is defensive preparations. These have

Table 5.5: Methods of Protection

	Percent of Societies	Relationship with Changes in Territory/ Autonomy (gamma)
18. Personal Protection		
shields and armor	11	
armor only	13	
shields only	53	.43
no protection	22	(40)
	100	
	(45)	
19. Defensive Preparations*		
boundaries of political communities are guarded or fortified	present in 9 societies	b
guards are posted at residential sites	present in 21 societies	b
residential sites are located in defensive positions	present in 22 societies	b
residential sites are fortified		
yes	78	
no	22	-.17
	100	(36)
	(40)	
residential sites can mobilize in organized fashion after attack	present in 13 societies	b
residential sites can call for reinforcements from outside	present in 9 societies	b
residential sites are equipped for sieges	present in 8 societies	b
members of residential sites can retreat to a fortified position	present in 7 societies	b

b insufficient data

Table 5.5: Methods of Protection (continued)

Coding of Independent Variables:

18. Personal Protection
     1= shields; none
     2= both shields and body armor; body armor
19. Defensive Preparations (fortification of residential sites)
     1= absent
     2= present

various purposes. Fortifying and guarding residential sites (and the boundaries of political communities) help prevent surprise, make it difficult for the enemy to attack, and lessen the loss of life and property in the event of attack. Locating residential sites in defensive positions, such as on the top of hills, on an island, or at the edge of a swamp, accomplishes the same objectives. Table 5.5 suggests that fortifying residential sites, locating residential sites in defensive positions, and posting guards at residential sites were the most common defensive preparations in the sample societies.

There is some disagreement about the value of defensive preparations in relation to their costs. One view is that limited resources are better spent upon recruiting, equipping, and training warriors since doing this not only deters attacks but also insures the defeat of the enemy in the event of attack.

This view seems to be supported by my data. As I indicated above, large military units and professionals are positively associated with both a low frequency of enemy attack and with strategic success.

Another view is that defensive preparations are worth their costs because they deter attacks and minimize losses of population, property, and territory in the event of attack. In my sample, however, there was virtually no relationship between residential fortifications and frequency of enemy attacks (gamma = .12, p > .10, N = 21). Nor, as Table 5.5 shows, was there any relationship between residential fortifications and strategic success (gamma = -.17).

It would seem that defensive preparations would be of great importance only in small, sedentary political communities that are vulnerable to destruction in the event of enemy attack. For other

political communities such preparations may be unnecessary or in-
feasible. A mobile group of pastoralists, for example, may be able
to flee in the event of attack because it lacks immobile property.
A large political community, such as a populous state, is less vul-
nerable to destruction in the event of attack because of the large
number and dispersion of its residential sites.[1]

Military Strategy

A final aspect of military practices is strategy, which includes
the initiation and termination of war, military alliances, and reasons
for engaging in war.

The capacity to conduct diplomatic negotiations is important to
a political community for several reasons. In some situations diplo-
matic negotiations enable a political community to settle conflicts
peacefully and thereby avoid wars that it cannot win and wars that
would result in serious losses of population, property, and terri-
tory. In other situations diplomatic negotiations enable a politi-
cal community to terminate wars before they run their course. If
allowed to continue, unacceptable losses of population, property,
and territory might result. In wars where the outcome is certain,
diplomatic negotiations enable the winner to dictate the terms of
surrender and the loser to sue for peace. Table 5.6 shows that the
gamma for diplomatic negotiations (.38) was moderately large but not
statistically significant.

The methods that political communities to use to initiate war

---

[1] The Vietnam war is an example of a misguided defensive strategy.
The government fortified residential sites but was relatively un-
successful in engaging and closing with the enemy.

Table 5.6: Military Strategy

	Percent of Societies	Relationship with Changes in Territory/ Autonomy (gamma)
20. Diplomatic Negotiations		
political community capable of terminating war by diplomatic negotiations	55	
political community does not terminate war by diplomatic negotiations	45	.38 (29)
	100 (31)	
21. Initiation of Warfare		
political community uses surprise	90	
initiates warfare only by announce- ment or mutual arrangement	10	a
	100 (39)	
22. Defensive Alliances		
yes	79	
no	21	.11
	100 (38)	(34)
23. Offensive Alliances		
yes	69	
no	31	.54
	100 (36)	(33)
24. Reasons for Engaging in War		
political reasons	19	
other reasons, does not engage in war	81	.39 *
	100 (58)	(50)

*** p < .01   ** p < .05   * p < .10

a insufficient variation in independent variables (fewer than five cases in one of the categories of the independent variable)

Table 5.6: Military Strategy (continued)

Coding of Independent Variables:

20. Diplomatic Negotiations
    1= war is not terminated by diplomatic negotiations (i.e., by cessation of combat)
    2= war is terminated by diplomatic negotiations; war is terminated either by diplomatic negotiations or by cessation of combat
21. Initiation of Warfare
    1= by announcement or mutual arrangement
    2= by surprise attack; either by surprise attack or by announcement or mutual arrangement
22. Defensive Alliances
    1= absent
    2= present
23. Offensive Alliances
    1= absent
    2= present
24. Reasons for Engaging in War
    1= revenge/defense; economic; prestige
    2= political (i.e., subjugation and tribute)

are important because of their effects upon the success of military

attacks. Surprise is the most effective method since military units

can plan their attacks and spring them at times and places of their

own choosing before the enemy is able to make preparations. The most

important dictum of warfare, perhaps, is to stay on the offense. Its

major advantage is surprise. After war is initiated, the enemy is

kept off balance and is always reacting to military action rather

than initiating it. Table 5.6 shows that political communities in

an overwhelming proportion of societies (90 percent) used surprise

as a method of initiating war. Other methods of initiating war, such

as announcement and mutual arrangement, are less effective because

much of the advantage of surprise (other than tactical) is lost.

Another aspect of strategy is military alliances. Alliances

are of two types: defensive and offensive. An obvious purpose of

defensive alliances is to increase the military forces available in

the event of enemy attack. Due to the strategic importance of the

size of military units, the incidence of defensive alliance should

be quite high. Table 5.6 shows that they existed in a very high pro-

portion (79 percent) of the sample societies.

The high incidence of defensive alliances suggests that balance

of power races involving coalitions of political communities were

very widespread in the sample societies. This would be consistent

with Richard Alexander's (1979) hypothesis about the importance of

balance of power races in history. If these were unimportant, the

incidence of defensive alliances would presumably be much less. It

is also interesting to note, although there are very few cases for

analysis, that defensive alliances are positively associated with

the frequency of enemy attack (gamma = .77, p < .05, N = 22). They seem to be a response to enemy military action rather than a method of deterring such action.

An obvious purpose of offensive alliances is to increase the military forces available for attack. Like defensive alliances, the incidence of offensive alliances should also be high. Table 5.6 shows that they existed in 69 percent of the sample societies.

The high incidence of offensive alliances has identical implications in regard to the importance of balance of power races in history. Not surprisingly, offensive alliances are positively associated with the frequency of attack (gamma = .81, p < .05, N = 21). Also, not surprisingly, offensive alliances are positively associated with the frequency of enemy attack (gamma = .70, p < .05, N = 18), suggesting that the tit-for-tat strategy is widespread.

A final aspect of strategy is the reason (or reasons) that a political community has for engaging in warfare. A political community that doesn't have a reason or is uncertain of its reasons doesn't have a military strategy. It will have difficulty planning military actions to accomplish concrete objectives and as a consequence is more likely to be defeated.

The most advanced reason for war (see Chapter 4) is conquest and subjugation. Political communities that go to war for these reasons should enjoy an advantage over those that do not. The ability to threaten the survival of enemy political communities probably deters attacks (gamma = .67, p < .10, N = 28). The ability to defeat and annex them can lead to substantial gains in population, property, and territory, enhancing prospects of survival and growth.

Table 5.6 shows that only 19 percent of the sample societies had political communities capable of engaging in war for conquest and subjugation. The gamma for reasons for engaging in war, however, was moderately large (.39) and statistically significant, indicating the strategic advantage of the practice. It is apparent that many political communities were unable to conquer and subjugate their enemies because they lacked the means to do so. The question of what it is that enables political communities to do this is of great importance because it may explain why the political communities of today have particular characteristics rather than others.

Military Practices in Combination and Their Effectiveness

Although the analysis of bivariate relationships says something about the relative effectiveness of different military practices, it would be more interesting to know their effectiveness in combination. As I indicated above, however, this is difficult to do in my study because of the small sample size and missing data. The best that can be done is to construct a simple index under the assumption that, because it includes a number of military practices, it is a somewhat better measure of the overall military effectiveness.

The index that I will construct is identical (or nearly identical) to an index constructed earlier by Keith Otterbein (1970). Although I collected data on more military practices than he did, it seemed useful to construct an index that included the same practices that were included in his index so that I could attempt to replicate his results. A total of eleven items were included in Otterbein's index, which he called "military sophistication." The eleven items included in Otter-

bein's index correspond to military practices #2, #4, #6, #9, #10, #14, #16, #18, #19, #20, and #24.

Otterbein included in his index only those military practices which did not depend logically upon the presence of another practice and only those practices that were positively associated with centralized political systems (i.e., chiefdoms and states) and conferred a survival advantage. It should be noted that I was unable to find any survival advantage associated with items #9, field fortifications, and #19, fortification of residential sites.

Otterbein constructed his index by counting the number of effective military practices that existed in a society and dividing this by the total number of military practices (11 if data were complete, less than 11 if data were missing on one or more practices). His index of military sophistication, therefore, can vary between 1.0 and 0.0, with 1.0 reflecting the highest possible military sophistication, and 0.0 the lowest.

Otterbein dichotimized his scale at 0.5, dividing his societies into two groups -- one group with a relatively high degree of military sophistication, another group with a relatively low degree of military sophistication. I constructed my index using the same methods that he used. The only difference between my method and his is that I found it necessary to exclude from my analysis several societies which were not autonomous (note: he excluded such societies from his sample).

Table 5.7 below shows the relationship between my index of military sophistication, a replication of Otterbein's index, and changes in territory/autonomy. My expectation is that this relationship is positive. A low degree of military sophistication should be associated

Table 5.7: Military Sophistication and Changes in
Territory/Autonomy

Military Sophistication	Changes in Territory/Autonomy		
	Decrease	Stationary/ Break Even	Increase
Low	13	15	6
High	3	9	6

N= 52   gamma= .42
                 p > .10

with losses in territory/autonomy, and a high degree of military soph-
istication should be associated with gains in territory/autonomy. As
is evident from inspection, the relationship was indeed positive but
not statistically significant.

The direction of the relationship, although not statistically
significant, does replicate Otterbein's findings. Perhaps the most
noteworthy aspect of this relationship is that societies in which
political communities had a high degree of military sophistication
were much less likely than others to lose territory/autonomy. Mili-
tary sophistication, therefore, seems to be a (nearly) necessary but
not sufficient condition for the survival of political communities.

Military Practices and Political Centralization

As I have just shown, the military sophistication of political
communities is positively correlated with their strategic success as
measured by changes in territory/autonomy. It is important at this
point to ask whether effective military practices are found in dis-
proportionately high frequency in political communities with particu-
lar structures. If they are, those structures should have a greater
chance of survival in a competitive milieu.

A distinguishing characteristic of the structure of political com-
munities is their degree of political centralization, as indicated by
the number of their territorial (or subdivisional) levels. This char-
acteristic, because of its correlation with other structural charac-
teristics such as size, permanence, coherence, and scope of authority,
is a good indicator of much of what distinguishes simple from complex
political communities.

My expectation is that political communities with a high degree of centralization (or "centralized") possess structural characteristics such as large size, permanent offices, and wide-ranging authority that facilitate the use of effective military practices. This hypothesis is identical to that of Otterbein's (1970), so that my results allow a check of his earlier findings.

I measured the degree of centralization by determining the number of territorial (or subdivisional) levels within political communities as indicated by the level of sovereignty in external defensive warfare (or other types of warfare, where information on the level of sovereignty in external defensive warfare was lacking). The greater the number of territorial levels, the greater the degree of centralization. To simplify presentation I collapsed levels to obtain two groups — uncentralized political communities with two or fewer territorial levels (largely equivalent to Otterbein's bands and tribes) and centralized ones with three or four levels (largely equivalent to chiefdoms and states).

I will use the statistic "phi" as a measure of the strength of the relationship between degree of centralization and military practices. Phi varies between zero and one. For purposes here, a large phi indicates that uncentralized political communities tend to use a less effective military practice, whereas centralized political communities tend to use a more effective one. Phi measures strong monotonicity. It reaches its highest level of 1.0 when two diagonal cells of a four cell contingency table are empty.

Table 5.8 presents the results of this analysis. As is readily apparent, centralized political communities tended to use the more

Table 5.8: Military Practices and Political Centralization

Military Practice	Phi	Otterbein's Phi	% Uncen[c]	% Cent	N
Sovereignty					
1. Defensive Sovereignty	a		95	100	36
2. Offensive Sovereignty	.43 **	.48 ***	54	94	39
3. Internal Sovereignty	a		76	85	30
Weapons					
4. Shock Weapons	.33 **	.26 *	61	94	52
5. Projectile Weapons	a		97	100	52
Tactics					
6. Tactical Systems	.42 ***	.26 *	41	86	43
7. Duration of Offensive Campaigns	.42 **		29	73	32
8. Siege Operations	.67 ***		8	27	37
9. Field Fortifications	.57 ***	.41 **	31	89	22
Military Units					
10. Composition of Military Units	.66 ***	.31 **	9	73	50
11. Size of Military Units	.68 ***		6	70	27
12. Methods of Recruiting Non-Professionals	.02		52	50	41
13. Number of Levels in Chain of Command	.69 ***		13	83	35
14. Subordination within Military Units	.18	.23	48	67	33
15. Rewards for Heroism	b				
16. Cavalry	.42 ***	.16	18	60	49
17. Specialized Units (other than cavalry)	b				
Methods of Protection					
18. Personal Protection	.35 **	.36 **	19	55	43
19. Defensive Preparations (fortification of residential sites)	.13	.46 **	75	86	38

Table 5.8:   Military Practices and Political Centralization
(continued)

Military Practice	Phi	Otterbein's Phi	% Uncen[c]	% Cent	N
Military Strategy					
20. Diplomatic Negotiations	.47 **	.30 *	7	50	30
21. Initiation of Warfare	a		96	77	37
22. Defensive Alliances	a		90	92	33
23. Offensive Alliances	.15		87	75	31
24. Reasons for Engaging in War	.64 ***	.68 ***	18	100	53

*** p < .01   ** p < .05   * p < .10

[a] insufficient variation in independent variable (fewer than five cases in one of the categories of the independent variable)

[b] insufficient data

[c] percent of societies with uncentralized political communities using the effective military practice

Coding of Independent Variables: (see Tables 5.1 through 5.6)

effective military practice in virtually all categories. The values

of phi in some categories can be contrasted with those obtained by

Otterbein. Although there are differences between these values, in

most cases they are not especially large. The only categories in

which the values of phi differed substantially were composition of

military units, cavalry, and fortification of residential sites. The

differences here, I think, are attributable to sampling error and to

small differences in coding criteria.

As I indicated above, the causal relationships between military

practices and political structure may be quite complex. Although

the most effective method of identifying these relationships is to

observe changes that occur to political communities over time, this

is impossible with my sample. Instead, I will use degree of central-

ization as a surrogate for time and assume that uncentralized poli-

tical communities are more primitive than centralized ones (even

though they may have existed and been observed at the same or at a

later point in history). The rationale for doing this is that un-

centralized political communities (that are fully autonomous) are

today virtually extinct. In doing this it is presumed that ob-

served differences in the incidence of military practices between

uncentralized and centralized political communities are an indica-

tion of the direction and magnitude of change.

Table 5.8 shows the incidence of the more effective of alterna-

tive military practices within different categories of both uncentral-

ized and centralized political communities. For purposes of simplify-

ing the discussion below, "low proportion" means that a practice exists

in 0-33 percent of the sample societies, "moderate" in 34-66 percent,

and "high" in 67-100 percent.

An effective military practice which exists in a high proportion of both uncentralized and centralized communities, while it might be a necessary condition for increased centralization, is unlikely to be a direct cause of it. As Table 5.8 shows, there were seven categories in which the effective military practice was distributed in this way: defensive sovereignty, internal sovereignty, projectile weapons, defensive preparations, initiation of warfare, defensive alliances, and offensive alliances.

The high incidence of effective military practices in these categories suggests their importance to the survival of both uncentralized and centralized political communities. Otherwise, their incidence should be less. However, their high incidence in both types of political communities suggests that there is little or nothing about the structures of centralized political communities that engenders or facilitates their use.

An example is defensive alliances. These seem to be important to political communities regardless of their degree of centralization. For uncentralized political communities these alliances are used to counteract the threats of offensive alliances of other uncentralized political communities as well as centralized ones. Examples are the alliances between Indian tribes in North America during the 18th and 19th centuries. For centralized political communities these alliances are used principally to counteract the threats posed by centralized political communities and their alliances. An example is NATO, which counteracts the Warsaw Pact.

An effective military practice which exists in a high proportion

of centralized political communities but in only a low (or very low)

proportion of uncentralized political communities would seem likely

to be caused by (or at least facilitated by) increased centralization.

Table 5.8 shows that there were six categories in which the effective

military practice was distributed like this: duration of offensive

campaigns, field fortifications, composition of military units, size

of military units, number of levels in the chain of command, and rea-

sons for engaging in war. All (or many) of the effective military

practices in these categories are presumably dependent upon the struc-

tural changes that accompany increased centralization. For example,

the population increases that accompany centralization may make it

possible to have larger-sized military units.

An effective military practice that exists in a moderate propor-

tion of uncentralized political communities and a high proportion of

centralized political communities would seem to be more likely a

cause than a consequence of increased centralization. The relation-

ship might also to some extent be reciprocal. Table 5.8 shows that

there were four categories in which an effective military practice was

distributed like this: offensive sovereignty, shock weapons, tactical

systems, and subordination within military units. These practices,

more so than others, would seem to be necessary conditions for the

conquest of hostile political communities, as in the Zulu example.

As I discuss in Chapter 6, conquest can lead directly to increased

centralization.

The causal relationships that exist for other military practices

are more problematic. One effective military practice, siege opera-

tions, existed in a low proportion of both uncentralized and central-

ized political communities. Its virtual absence in uncentralized political communities, however, suggests it is more likely a consequence than a cause of increasing centralization -- that is, centralized political communities are more likely to have the capacity to conduct sieges and will use them when it is to their advantage to do so.

Three effective military practices -- cavalry, the use of shields and armor (or armor alone), and diplomatic negotiations -- existed in a low proportion of centralized political communities. These practices are probably facilitated by increased centralization, but do not depend on it.

Summary

Military practices vary in their effectiveness and thus affect the strategic success of political communities as measured by changes in territory/autonomy. Military sophistication seems to be a necessary but not a sufficient condition for strategic success. The causal relationships between military practices and political structures are complex. Some military practices seem to be necessary conditions for increased centralization. Others seem to be mostly a consequence of the structural changes brought about by increased centralization. Others, however, may be a direct cause of increased centralization, probably by making it possible for a political community to conquer its enemies. The structural characteristics of the highly centralized political communities that exist today are due in large part to the military practices that they use and to the advantages of these in a competitive milieu.

CHAPTER 6

POLITICAL ACTIVITIES AND STRUCTURES: PROBLEMS OF
EXTERNAL POLITY

In this chapter I look at the question of whether the activities
and structures of political communities are in large part the conse-
quences of intergroup competition and conflict. I present evidence
from the sample societies that is consistent with this hypothesis
but not with others. It indicates that the necessary and sufficient
function of political communities is defense of their members from
the attacks of hostile groups of humans. While it is clear that
political communities engage in a wide range of activities, I argue
that the normal or characteristic activity of political communities
is defense, and that other activities are either incidental to or
consequential to defense.

In this regard, protection is the principle benefit that most
individuals derive from living within political communities. The
only individuals who benefit in other ways are the political offic-
ials (and their families) who run political communities. For most
individuals, however, protection is the only benefit that outweighs
the costs of living within political communities. The most important
of these costs is intensified competition for resources. Without the
benefit of protection, political communities would not exist.

In the previous chapter I showed that the military sophistication of political communities seemed to be a necessary condition of strategic success or avoiding losses in territory/autonomy. Those political communities that use effective military practices are more likely to defend themselves successfully and survive than those which do not.

I also showed that the use of effective military practices was strongly associated with the degree of centralization. This presumably explains why uncentralized political communities have perished while many that are centralized have survived.

If it is true that defense is the necessary and sufficient function of political communities, then defensive problems should have a disproportionate impact upon their activities and structures. To test this hypothesis I will look first at the incidence of different activities within political communities. Those that are relevant to defensive problems should occur with greater frequency than other activities. Next, I will look at the structure of political communities as indicated by the incidence and distribution of sovereignty within them. These structural characteristics should also reflect the impact of defensive problems.

The Incidence of Political Activities

To test the hypothesis that activities relevant to defensive problems occur with greater frequency than other activities, I collected information on the incidence within political communities of sixteen different activities. Five of these are connected with warfare and problems of external polity: external defensive warfare, defensive alliances, external offensive warfare, offensive alliances, and diplomatic negotiations. Three are linked with problems of social

control: judicial/arbitration activities, police activities, and rule making/legislative activities. Six are connected with the economy: control or regulation of trading or markets, land distribution, food distribution, public works, the collection of taxes, tribute, and labor services, and hunting/fishing. One is connected directly with the political structure: the recruitment of political officials. One is connected with the supernatural: ceremonial/religious activities. This list, while it may not be exhaustive, does include most of the activities that occur and are important within political communities.

It is important to note that in any given political community one or more of these activities may occur but not be "political." According to my definition, an activity is political only if it is of widespread public importance. It is not political if it does not (potentially) involve or affect all of the members of a political community or one of its subdivisions.

The way in which I determined an activity to be present or absent needs some comment. For activities linked with warfare I simply noted whether the activity was present or not. These activities are almost always political because they typically involve or affect everyone within a political community or one of its subdivisions. I regarded diplomatic activities as present if a political community was able to conclude wars using negotiations. I regarded recruitment as present if political officials existed.

For all other activities I noted whether there was an individual and/or group who had public authority in the activity. Authority, according to Webster's, is "the power or right to give commands, enforce obedience, take action, or make final decisions." According to this

definition, therefore, an individual has authority if he is able to take action on his own or is able to get others to take action. Authority that is public (potentially) involves or affects all of the members of a political community or one of its subdivisions.

For some activities there was little ethnographic information. For these I was able to note only if the activity was present based upon whether or not it was noted in the ethnographic literature. The percentage for each of these activities, therefore, is a minimum proportion of societies in which the activity was present. It is an underestimate of the actual proportion. Its usefulness as an estimate of the actual proportion would depend upon the adequacy of the ethnographic information. In this regard, it is my impression that information is excellent on ceremonial/religious activities but not as good on various economic activities.

Of the sixteen activities, two are of obvious functional importance because of their linkage to problems of defense: external defensive warfare and the recruitment of political officials. A society which did not defend itself would presumably be at the mercy of any political community that attacked it. Similarly, a society without political officials would be unable to defend itself since nobody would have the authority to coordinate defensive activities. The incidence of these two activities, therefore, should be higher than for any others.

Table 6.1 shows the incidence of these sixteen political activities within the sample societies. I looked only at the 56 societies with autonomous or partially autonomous ("de facto" autonomy) political communities. Societies without autonomous political communities (Baiga,

Table 6.1: The Incidence of Political Activities

	% present	N
Activities Linked with Warfare:		
external defensive warfare	93	(43)
defensive alliances	75	(32)
external offensive warfare	93	(41)
offensive alliances	75	(32)
recruitment of political officials	98	(56)
diplomatic	55	(31)
Activities Linked with Social Control:		
judicial/arbitration	78	(49)
police	54	(48)
rule making/legislative	38	(47)
Activities Linked with the Economy:		
collection of taxes, tribute, and labor services	58	(52)

	% noted
trading/markets	25
land distribution	36
food distribution	38
public works	30
hunting/fishing	20
Other Activities:	
ceremonial/religious	73

Mogh, Cebu, Tewa) were not able to engage in warfare freely and there-
fore are irrelevant to the hypothesis that I wish to test. The table
presents estimates of the percentage of the sample societies with
political communities that engaged in a particular activity.

The incidence of external defensive warfare (93 percent) and the
recruitment of political officials (98 percent) were high enough to
suggest the possibility that these activities are universal or almost
universal among political communities. If this were true it would
support my hypothesis that political communities are principally solu-
tions to problems of defense.

My argument with regard to defense would seem to be valid except
that there were three societies in the sample which did not engage in
defensive activities. These societies were the Dorobo, the Manihiki,
and the Selung. There was also a single society in the sample which
did not recruit political officials: the Selung. It is important to
look more closely at these societies because they are deviant cases
that are potentially fatal to my hypothesis.

The Dorobo would not be fatal to the hypothesis because the
political communities of this society enjoyed only partial autonomy.
At the time that G.W.B. Huntingford studied the Dorobo, they occupied
a remote forested highland area in what is now central Kenya. Apparent-
ly the Dorobo had retreated to this less desirable area because of the
intrusion into their ancestral territory of more powerful tribes such
as the Kikuyu.

The Dorobo didn't engage in defensive warfare because they
didn't need to--they were left alone by the other more powerful tribes.
Supposedly, the Dorobo had little or nothing of value to these tribes

(except women, perhaps?). On the few occasions when single Dorobo did encounter a hostile intruder, they defended themselves with weapons that they regularly carried for use in hunting. So long as the Dorobo were left alone, therefore, they had no use for military units.

They did, however, have political communities. Although these were not especially complex -- consisting only of district level councils that engaged in judicial activities -- the existence of such activities in a situation where defensive warfare did not occur is puzzling. I think that it is quite possible, although the evidence is not entirely clear, that the complexity of Dorobo political communities had diminished substantially by the time Huntingford studied them. They engaged in fewer activities than they had previously at a time when the Dorobo fought in or prepared for war. The judicial activities that Huntingford observed, therefore, were vestigial. The anthropologist Elman Service (1962) made a similar argument to account for anomalies in the structure of kinship groups among North American Indians who had suffered from disease, famine, and pacification after their defeat by Western powers.

A second deviant case, the Manihiki, is particularly interesting. Manihiki is an isolated island in the South Pacific. Like other islands in the region, its initial inhabitants must have arrived on it largely by accident. The traditional history of the society, which was studied by Peter H. Buck, indicates that a single chiefly lineage was the original basis of political organization on the island. A dispute over chiefly succession, however, resulted eventually in the establishment of two chiefly lineages (called the "dual arikiship"). It appears, therefore, that Manihiki had at least one political community

and at a later stage of its history, possibly two.

The traditional history of Manihiki, according to Buck, gave no indication that warfare had ever occurred on the island. This is contrary to expectation. For if defense is the necessary and sufficient function of political communities, and warfare or the threat of warfare never existed on Manihiki, it is difficult to see why there was a political community at all on Manihiki and why such a political community, after it came into existence, persisted.

There are two possibilities. One possibility is that warfare or the threat of warfare existed on Manihiki (with the enemy located on another island) without the historical tradition recording this (unlikely, I think). The other possibility is that my hypothesis is false or needs to be modified in some way. Warfare or the threat of warfare is not always a necessary condition for the existence of political communities.

Several things, I think, explain the existence of a political community on Manihiki. The first is cultural inertia. The initial inhabitants of the island established a political community because they had never previously lived without one. The second is the transparent economic and social advantages for any kinship group that was powerful enough to establish and control a political community. The attempt to impose a political community in the absence of any external threat might succeed because of the extreme isolation of the island. Aside from travelling to the island of Rakahanga (habitable?), there was no place to go. Leaving the island was practically equivalent to suicide. The only other options would be to overthrow the ruling kinship group or to establish a separate ruling group.

The isolation of Manihiki, therefore, was a centripetal force.
It held a political community together that otherwise would have
broken apart because of exploitation. The hypothesis, therefore,
should be modified to account for unusual conditions in which individu-
als tolerate life within political communities because there is some
other benefit that they derive from living where they do. For the
Manihiki this benefit was a localized resource--a habitable island in
the middle of a very large ocean.

The third deviant society, the Selung, are also not fatal to the
hypothesis. The Selung were driven from their ancestral territory on
the Asian mainland by the Burmese and Malays. They took refuge from
these stronger peoples by going to sea in boats, by living in small
groups, and by scattering and fleeing at the sight of any boat that
might hold pirates or other enemies.

The methods of defense used by the Selung did not involve coopera-
tive effort, other than flight, at the group level. Since there was
no basis for the existence of political communities, the Selung should
not have had any. This appeared to be the case. According to Walter
White, the missionary who observed the Selung, most of their small
groups did appear to be entirely acephalous or leaderless. A few
groups seemed to be "led" by "headmen" who were ethnic Chinese making
their living by purchasing opium and supplying it to the Selung in
exchange for various products they were able to dredge off the sea
bottom.

Since White does not tell us, it is difficult to know if these
Chinese "headmen" had much if any authority within their groups. I
would tentatively classify the Selung as a society _without_ political

communities. The Selung may be similar to the groups of Shoshone Indians who lived in family units in desolate Great Basin desert areas of North America. The Shoshone fled into these areas to escape the attacks of mounted Indians on the plains.

These deviant cases do not appear to be fatal, therefore, to the hypothesis that all (or nearly all) autonomous political communities engage in defensive warfare. The evidence supports the argument that defense, except in uncommon cases of geographical isolation, is the necessary and sufficient function of political communities.

This hypothesis is much different from the idea that all political communities, whatever their degree of structural complexity, perform the same requisite functions (Almond and Coleman, 1960). The root of this idea is that societies have the same basic needs and that political systems are subsystems within societies that meet some of those needs. An implication of this idea is that political communities all engage in the same set of activities.

The percentages of Table 6.1, however, are not consistent with this view. If it was true there would presumably be a fairly substantial number of activities with an incidence of 100 percent. As the table shows, however, none of the activities had an incidence of 100 percent, and only three activities approached this level.

An alternative argument to my hypothesis -- that predation is a necessary function of political communities -- would also seem to be valid. There were only three societies in the sample which did not engage in offensive activities. Not surprisingly, these are the same three societies that did not engage in defensive activities: the Dorobo, the Manihiki, and the Selung.

All three of these societies seem to have lacked military units either because they did not have defensive problems (Dorobo, Manihiki), or because such units would have been worthless for purposes of defense (the Selung, who lacked firearms).

The other possibility is that these societies lacked military units because such units would have been worthless for purposes of offense. Two of these societies, the Dorobo and the Selung, confronted powerful neighbors, and the third society, Manihiki, was isolated. The evidence on the incidence of political activities, therefore, is ambiguous in differentiating between the defense and predation arguments.

It is important at this point to note the relevance of the old axiom that the best defense is a good offense. The political community that engages in offensive warfare gains the advantage of surprise. It fights on the territory of the enemy so that his property is damaged/destroyed, his population killed, and his territory/autonomy lost. A political community that only reacted to attacks after they had occurred would be at a disadvantage. It would lose the advantage of surprise and more often than not would be fighting on its own territory.

This is especially true when balances of power are unstable. To sit back and wait for the enemy and his allies to attack when his military strength is growing may be suicidal. An offensive attack gains the advantage of surprise and has a better chance of reducing the enemy's strength and restoring balances of power.

All of this suggests that offensive military actions often have defensive purposes. The opposite, however, would not seem to be

true. Thus, although political communities surely do attack their enemies to garner resources, they also attack because doing so is an appropriate response to defensive problems in a competitive milieu.

The lower incidence within political communities of 13 other activities is presumably due to their lesser importance. They have less to do with defensive problems than external defensive warfare, external offensive warfare, and the recruitment of political officials.

The evidence on political activities, therefore, is consistent with the hypothesis that the principal benefit that individuals derive from political communities is protection. If some other benefit was more important, activities relevant to it should be more common than defensive activities. This, however, was not true.

The Incidence of Sovereignty

A political community that hopes to defend itself successfully needs to use more effective military practices than its enemies. The use of such practices requires that political officials, warriors, and other members of the political community coordinate their actions. Villages or boundaries must be guarded and fortified. Military units must be recruited, trained, and equipped. Chains of command must be established so that warriors know what to do during an attack. These activities involve large numbers of people. To be effective, somebody must exist who has final authority to insure that all of these people do the right things at the right times.

In politics the concept of sovereignty is often used to describe a situation in which someone has supreme or final authority. A

"sovereign" has the power or right to take public action on his own
or is able to get others to take such action and to do these things
without the approval of others. For example, a political community
may have an official who has final authority to decide whether or not
to launch an attack but may lack an official who has final authority
to collect taxes, tribute, and labor services. The likelihood of sover-
eignty existing in any given activity would seem to reflect two things:
the linkage of the activity to defense and the importance of sovereign-
ty to the conduct of the activity.

Obviously, sovereignty in an activity cannot exist if the activity
itself doesn't. As I just showed, those activities with a close link-
age to problems of defense, particularly external defensive warfare
and the recruitment of political officials, occur more frequently with-
in political communities than other activities.

The importance of sovereignty to the conduct of an activity would
seem to depend upon whether the activity requires coordinated action
and whether it imposes costs upon those who engage in or are affected
by it.

These conditions are especially prominent in defensive activities.
As I argued above, these require the coordinated actions of political
officials, warriors, and others. They also impose costs upon those
who engage in or support them.

These costs can be substantial. The guarding of villages or
territorial boundaries is very tedious work. The construction of
fortifications can be very costly. The recruitment, training, and
equipping of military units puts heavy burdens on those in the politi-
cal community who support these units. Membership in military units

can be dangerous or fatal in wartime and in many societies is less rewarding than civilian life.

The magnitude of these costs makes it difficult or impossible for political communities to rely on voluntary actions to make defensive preparations and conduct defensive warfare. In Chapter 5 I showed that many political communities in the sample societies had very inadequate defensive preparations. Only about half of the political communities were able to rely upon volunteers to fill military units.

To test this hypothesis about sovereignty I gathered information on the incidence of sovereignty of various types within the political communities of the sample societies. Sovereignty was identified as either present or not present in eight activities: external defensive warfare, political recruitment, internal warfare, external offensive warfare, judicial/arbitration activities, the collection of taxes, tribute, and labor services, police activities, rule making/legislative activities, and ceremonial/religious activities. Information on other activities was generally inadequate. Appendix D presents information on who was sovereign in an activity and on the territorial or subdivisional level at which sovereignty existed.

Table 6.2 shows the incidence of sovereignty in different activities in the political communities of the sample societies. I used in calculations only those societies with autonomous or partially autonomous political communities. The table shows, in support of my hypothesis, that the incidence of sovereignty was highest in external defensive warfare (95 percent).

The incidence of sovereignty was also quite high in internal warfare (88 percent). This may be due to the high risk of retaliation

Table 6.2: The Incidence of Sovereignty

	% present	N
external defensive warfare	95	(43)
internal warfare	88	(24)
external offensive warfare	67	(43)
judicial/arbitration activities	78	(49)
collection of taxes, tribute, and labor services	58	(53)
police activities	54	(48)
rule making/legislative activities	40	(47)
ceremonial/religious activities	33	(54)

from attacks upon political communities of the same society. To

avoid the risks of retaliation, a political community needs an offi-

cial with the authority to prevent such attacks.

The incidence of sovereignty was also quite high in judicial/

arbitration activities (78 percent). Although sovereignty is appar-

ently necessary for the conduct of these activities (i.e., whenever

these activities exist, sovereignty also exists), it is not clear what

linkage, if any, these activities have to problems of defense. I look

at this question below.

The incidence of sovereignty in external offensive warfare was

also quite high (67 percent), presumably because sovereignty is

necessary to use effective military practices. It is important to

note, however, that the incidence of sovereignty in this activity

was less than its overall incidence. This suggests that external of-

fensive warfare is not always closely linked with defensive problems.

It also supports the argument that defense is a necessary func-

tion of political communities, but not predation. Data on the inci-

dence of activities were inconclusive. However, data on sovereignty

show a higher incidence in external defensive warfare than in exter-

nal offensive warfare. Sovereignty for purposes of defense is almost

universal, whereas sovereignty for purposes of predation (or attack)

is not.

The incidence of sovereignty was somewhat less in the collection

of taxes, tribute, and labor services (58 percent). Sovereignty in

these activities is also apparently essential to their conduct, pre-

sumably because of the costs they impose upon individuals. The some-

what lower incidence of sovereignty in these activities may reflect a

less close linkage to problems of defense than I had originally thought.

The incidence of sovereignty in police activities was moderate (54 percent). These activities, like judicial/arbitration activities and the collection of taxes, tribute, and labor services, impose costs upon the individuals who engage in or are affected by them. Not surprisingly, sovereignty appears to be essential to the conduct of this activity.

The incidence of sovereignty in other activities was somewhat less. For rule making/legislative activities and for ceremonial/religious activities, this presumably reflects their less important linkages to defense.

The Distribution of Sovereignty

One of the most important characteristics of the structure of political communities is the distribution of sovereignty. I have defined sovereignty as the right or power to make final decisions on matters of public importance in a particular activity. Sovereignty within political communities can be distributed in a variety of ways. I think it is useful, however, to think of sovereignty as being distributed along two dimensions.

The first dimension, which I call centralization, reflects the degree of concentration/dispersion of sovereignty between the different territorial or subdivisional levels of a political community. For example, in the United States, sovereignty in foreign policy is concentrated at the highest territorial or "federal" level, whereas sovereignty in police activities is dispersed between the federal, state, county, and municipal levels. The second dimension, which I call

polarity, reflects the degree of concentration/dispersion of sovereignty between individuals and groups within a political community. For example, in the United States, sovereignty in some areas of foreign policy, such as military spending, is shared jointly by the President and the Congress.

I will argue that these two dimensions and especially centralization are the direct outgrowth of defensive problems in the context of balance of power races. Some patterns of centralization and polarity facilitate the use of effective military practices and therefore increase the likelihood of a political community's strategic success. This explains why these patterns are characteristic of the political communities that exist today and not others.

Centralization

If the intergroup competition and conflict hypothesis is true, the causes of increased or decreased centralization should be linked to problems of external polity and in particular to problems of defense. In order to test this hypothesis, however, it is necessary to define centralization more clearly since it has many different meanings in the social sciences. It is a multi-dimensional concept. These different dimensions may be linked to problems of defense in somewhat different ways.

One use of the concept is to distinguish political communities with three or four territorial levels from those with only one or two. For example, a large state such as Japan has four territorial levels-- national, prefectural, city, towns and villages--and is a centralized political community, while a small hunter-gatherer group such

as a band of African Pygmies has only one--the camp--and is uncentralized.

A second use of the concept is to distinguish political communities in which sovereignty is concentrated at the highest territorial level from those in which sovereignty is dispersed among levels. For example, in cöntrasting sovereignty in two nation states such as the Soviet Union and the United States, the Soviet Union would be regarded as more centralized than the United States. The reason is that sovereignty in judicial, taxing, police, and legislative powers is concentrated at the national level in the Soviet Union, whereas in the United States the federal government shares sovereignty in these activities with the 50 states.

A third use of the concept is to distinguish political communities in which there is little or no autonomy for territorial levels below the effective level of sovereignty from those in which there is substantial autonomy. For example, local governmental officials in France and Japan are often thought to have much less autonomy than their counterparts in the United States.

All three of these uses of the concept of centralization pertain to important structural characteristics of political communities. For the sample societies, however, adequate information existed only on the first two of these structural characteristics: the number of territorial levels and the degree of concentration/dispersion of sovereignty among territorial levels. For this reason, I will focus upon these two aspects of centralization.

Number of Territorial Levels. The first dimension of centralization is the number of territorial or subdivisional levels. This

dimension, as I have already shown in Chapter 5, is positively correlated with the effectiveness of military practices. Thus, it seems quite likely that the causes of increased or decreased numbers of territorial levels might be linked to problems of defense.

(1) Measuring the Number of Territorial Levels. To measure this dimension of centralization I counted the number of territorial or subdivisional levels that existed within the political communities of the sample societies. For societies in which there were multiple political communities with different numbers of levels, I counted the number of levels that existed in the political community that was described most fully in the ethnographic literature.

I define "territorial level" as an area in which activities of public (or political) importance occur. Activities are of public importance if they affect (or potentially affect) everyone within a political community or one of its subdivisions. In general, the existence of an official with authority in an activity that was widespread (i.e., went beyond the limits of the extended family where this group was not coterminous with the membership of the political community) was taken as prima facie evidence that the activity was political.

An area is the land and/or waters within the boundaries (or home range in the case of migratory political communities) of a political community or one of its subdivisions. Subdivisions are portions of the land and/or waters of political communities or more inclusive subdivisions. In general, the existence of multiple levels or subdivisions within political communities was indicated whenever an official existed who was superordinate to other officials whose political authority extended over small and less inclusive

areas.

A territorial level, therefore, corresponds to a subdivisional level of a political community. If no activities of public importance occurred within a political community, I coded "no levels" or "no sovereignty." If activities were of public importance to residential sites but not to more inclusive territorial levels, I coded "residential site" level. I used the same criterion to code for "district" level, "provincial" level, and "state" level.

There is no standard terminology in the ethnographic literature to describe the various levels of multi-levelled political communities. For example, the word village could easily replace residential site. Or the word nation could replace state. Or the levels could simply be numbered one, two, three, and four similar to the way the sociologist Herbert Spencer used the concepts simple, compound, and double compound. My choice of concepts, therefore, was arbitrary in the sense that other concepts might be just as suitable.

For most of the sample societies it was easy to identify the number of territorial levels that existed within political communities; for some, however, it was not.

For some societies it was difficult to determine the territorial area that constituted a residential site. My definition of residential site was an area in which individuals and kin groups lived in close proximity to each other. In general, a residential site would correspond to units such as villages, cities, townships, and bands.

In some societies, however, households were spread out so that the boundaries of residential sites were not clearly marked. For example, Atsugewi "villages" were comprised of a central area inhabited

by a chief, his relatives, and other families, and small hamlets loca-
ted a short distance from the central area. Among the Lugbara, house-
holds were dispersed fairly evenly over the landscape so that sharp
boundaries between residential sites did not exist. In cases such as
these I assigned residential site level to the smallest inclusive
territory in which activities of public importance occurred that affec-
ted more than the minimal segment of extended kin groups (where these
existed).

Using this rule, Atsugewi residential sites would be comprised of
both the central area and the small hamlets. The small hamlets were
minimal segments of extended kin groups and their members participa-
ted to some extent in the activities of the central area. They were
not autonomous and therefore were not the lower level of a more
complex district level political community. For the Lugbara, residen-
tial sites would be comprised of households that were members of a
patrilineage. In this society the minimal segment of the extended
kin group was the patrilineal family.

In other cases it was difficult to determine the area that con-
stituted a residential site because such sites split up and merged on
a seasonal or temporary basis. For example, the residential sites of
the Dinka varied in size depending upon seasonal rains as these affec-
ted the availability of pasture for cattle. For the Dinka I assigned
residential site level to the small collection of households that
existed during the wet season. The reason that the latter situation
constituted a district level political community was that officials
existed with sovereignty over an area that during the dry season was
comprised of a number of these small collections of households.

Other examples of splitting up and merging on a seasonal basis

include the Iraqw, the Bungi, the Winnebago, the Bohogue, the Kiowa,

the Northern Saulteaux, and the Zuni. In these cases I assigned dis-

trict level whenever the groups splitting up constituted more than

minimal segments of extended kin groups and whenever the groups merg-

ing engaged in activities of public importance.

Other societies that are somewhat difficult to classify would

include imperial city states such as Songhai (Gao), the Inca (Cuzco),

and the Aztec (Tenochtitlan). I regard the capital cities of these

imperial city states as the fourth or highest state level and the

territories over which these cities ruled or obtained tribute as

provinces.

This method of classifying political communities differs from

those employed by anthropologists who generally use the categories

band, tribe, chiefdom, and state to distinguish between political

communities. Although anthropologists' definitions are ambiguous,

a band is a small group ranging in size from 25 to 75 (sometimes

smaller or larger) with an economy characterized by hunting and

gathering. A tribe is a collection of autonomous bands that are

linked together by overarching groups called sodalities. These sodal-

ities have specific purposes (e.g., military, dancing, curing, rainmak-

ing) and draw their membership from the different bands. A chiefdom

is characterized by kinship based hierarchical organization and a

redistributive economy. A state is like a chiefdom except that

its hierarchical organization includes non-kinship components and a

coercive police force.

For several reasons, I do not regard these categories as a

particularly useful way of distinguishing between political communities. One reason is that the definitions of these categories, particularly of the tribe, are somewhat ambiguous. For example, it is difficult to differentiate between a tribe and a chiefdom in cases where a redistributive economy exists but is not especially important. Another reason is that these definitions suggest a number of possible causes of increasing political centralization--i.e., defensive problems are the cause of tribes, economic problems are the cause of chiefdoms, and internal problems are the cause of states--rather than just a single cause. The definitions are based upon observation of correlations between selected cultural traits rather than a specific hypothesis about the causes of such correlations.

An example is the definition of the state as a political community that is distinguished from others (apparently!) by the existence of a monopoly of coercive force. It was also observed that inequalities of wealth were larger in states than in other types of political communities. It was easy to infer that states existed as a solution to problems of internal polity. A coercive police force existed to protect the privileged positions of the wealthy. The correlation between these two cultural traits, as I will argue in Chapter 7, however, is probably spurious.

I would regard my method of classification based upon the number of territorial levels in a political community as potentially more useful. One advantage is that the number of levels is an easier basis of distinguishing between political communities. A second advantage is its theoretical interest. According to my hypothesis, the number of levels in a political community is a direct consequence of the

defensive problems that accompany warfare.

Although I regard my method as potentially more useful, it is important to note that both methods result in assignments that are substantially the same. A band is typically a political community with only a single territorial level. A tribe or petty chiefdom typically has two levels, a paramount chiefdom three levels, and a state four levels.

Not all anthropologists rely entirely upon the categories band, tribe, chiefdom, and state to distinguish between political communities. In the Ethnographic Atlas, George Murdock coded societies for the number of jurisdictional levels. It is plain, since his coding correlates closely with my own, that he was actually measuring something similar to what I was. In any case I feel that the use of the word jurisdictional is inappropriate. It implies that the cause of centralization in political communities (or the addition of territorial levels) is the extension of judicial sovereignty. As I show below, however, this is wrong.

Keith Otterbein (1970) distinguishes between "uncentralized" political communities (i.e., bands and tribes) and "centralized" ones (i.e., chiefdoms and states). Other anthropologists divide things up somewhat differently by distinguishing bands from all other types of political communities or singling out the state for special attention. In any case, all of these methods generally do distinguish between political communities with different numbers of territorial levels, although they do so only indirectly.

(2) Territorial Levels and Strategic Success. The number of territorial levels of a political community should affect

its ability to defend itself. Those with more territorial levels should enjoy greater strategic success than those with fewer levels. This hypothesis is somewhat difficult to test using information on the sample societies because warfare quite often occurs between political communities with equal or nearly equal numbers of territorial levels. The giants among political communities are at war with other giants, the Lilliputians are at war with other Lilliputians. This would necessarily weaken the simple bivariate relationship between the number of territorial levels and changes in territory/autonomy.

Table 6.3 shows the relationship between this aspect of centralization and changes in territory/autonomy. While it is in the predicted direction, it is not particularly strong and is not significant. The direction of this relationship, however, replicates earlier findings by Otterbein (1970) and Tuden and Marshall (1972).

Another and perhaps better test of the importance of this aspect of centralization to changes in territory/autonomy is to pair sample societies against their enemies. Unfortunately, there was often little information on the external relations of the political communities of the sample societies and whether these relations resulted in changes in territory/autonomy. Also, there was often little information on the structural characteristics of the political communities of these enemies.

My strategy was to identify all of the societies with which the sample societies had external relations (if there was information) during the focal period and determine the nature of these relations and whether they resulted in changes in territory/autonomy. The number of levels of the political communities of these societies was

Table 6.3:   Number of Territorial Levels and Changes in
Territory/Autonomy

Changes in Territory/Autonomy

Number of Territorial Levels	Shrink or Lose	Stationary or Break Even	Expand or Increase
None	1	0	0
One	6	10	2
Two	1	6	2
Three	3	1	0
Four	2	3	4

N= 41   phi= .38

p > .10

determined directly (if this information was available) or from informa-
tion coded in the Ethnographic Atlas (the code for the number of juris-
dictional levels). In using this method, of course, it is difficult
to argue that the pairings which I have identified and upon which
information exists are a random sample of all such pairings. They
are not. Nevertheless, they do give some indication of how well poli-
tical communities with different numbers of territorial levels fare
against each other when they are in conflict.

Table 6.4 shows that the results of this test were unambiguous.
When political communities are in conflict and there are changes in
territory/autonomy, the political community that is more centralized
in the sense that it has a greater number of territorial levels almost
always gains territory/autonomy over its competitor. This finding is
entirely consistent with the historical fact that the frequency of cen-
tralized political communities has increased in relation to uncentral-
ized ones.

The following is a possible explanation of why political commun-
ities with a greater number of territorial levels than their opponents
enjoy a strategic advantage. Such political communities are generally
wealthier. They are able to use this wealth to maintain professionals
within military units. In my sample, political communities with pro-
fessionals in military units were far less likely than those without
them to suffer losses in territory/autonomy (8 versus 33 percent). One
reason for this, as I showed in Chapter 5, is that political communi-
ties with professionals are attacked less frequently.

Political communities with a greater number of territorial levels
are also more populous. As a result, they are able to recruit larger

Table 6.4:   Contrasting Numbers of Territorial Levels and
Changes in Territory/Autonomy

Changes in Territory/Autonomy

Contrasting Numbers of Territorial Levels	Sample Society Shrinking or Losing	Sample Society Stationary or Breaking Even	Sample Society Expanding or Increasing
Sample Society Has Political Communities with Fewer Territorial Levels	33	9	1
Sample Society Has Political Communities with the Same Number of Territorial Levels	12	11	11
Sample Society Has Political Communities with More Territorial Levels	2	16	59

N (number of paired societies)= 154   phi= .53

Notes:

1)   The number of territorial levels of the enemy societies was determined either directly or from the code in the Ethnographic Atlas.
2)   Many of the pairs come from a few of the sample societies: Aztec (46 pairs); Songhai (16 pairs); Kuba (7 pairs). These societies were imperial states. If these societies are deleted from this table, the relationship becomes somewhat weaker.

military units (phi= .46, p< .05, N= 29). As was shown in Chapter 5,
large military units seem to deter attacks. An obvious reason is that
large military units, other things being equal, will defeat small ones.
In my sample, political communities with large military units (greater
than 100) were far less likely than those with small units (100 or
less) to suffer losses in territory/autonomy (11 versus 44 percent).

A related reason is that large military units make it possible for
a political community to defeat and permanently subjugate any enemy
that would attack it (phi= .76, p < .01, N= 29). The ability of a
political community to defend itself in this way raises the political
stakes and not surprisingly also seems to deter attacks (phi= .48,
p > .10, N= 27). In my sample, only 13 percent of the political commun-
ities that retaliated in this way lost territory/autonomy, versus 31
percent that did not.

It seems apparent that the number of territorial levels within
political communities is associated with their ability to maintain
professionals within military units, recruit large military units, and
defeat and subjugate enemies. These effective military practices are
important for defense. It would seem, therefore, that territorial
levels exist for reasons of defense.

(3) Territorial Levels and Sovereignty. If the terri-
torial levels of political communities exist for defense and not for
some other reason, sovereignty in external defensive warfare should al-
ways exist at a territorial level as high or higher than sovereignty
in other political activities. If the addition of territorial levels
to political communities occurs because of defensive problems, the
extension of sovereignty that occurs as the consequence of such

an addition should initially involve authority in defensive activities. The extension of sovereignty will not necessarily involve authority in other activities. If territorial levels exist for some other reason, however, sovereignty in external defensive warfare might not exist at a territorial level as high or higher than sovereignty in other activities.

To test this hypothesis I identified the level of sovereignty in seven political activities: external defensive warfare, internal warfare, external offensive warfare, judicial/arbitration activities, the levying of taxes, tribute, and labor services, police activities, and rule making/legislative activities. The level of sovereignty in external defensive warfare was contrasted, in turn, with the level of sovereignty in these six other activities.

It is important to note that data that are consistent with the intergroup competition and conflict hypothesis would result simultaneously in the rejection of alternative hypotheses about political communities and their function(s).

The hypothesis that the necessary function of political communities is predation would seem to be incorrect if sovereignty in external offensive warfare was not located at a territorial level as high or higher than sovereignty in other activities. Similarly, the Marxist hypothesis that the necessary function of the state is the defense of class interests would seem to be incorrect if sovereignty in activities such as the collection of taxes, tribute, and labor services or sovereignty in police activities were not located at a territorial level as high or higher than sovereignty in other activities (at least in political communities with four territorial levels). The

argument of Hobbes that a sovereign exists to prevent general anarchy would seem to be incorrect if sovereignty in police activities was not located at a territorial level as high or higher than sovereignty in other activities. The argument of social contract theorists would seem to require that sovereignty in rule making/legislative activities exist at a territorial level as high or higher than sovereignty in other activities.

My hypothesis regarding the location of sovereignty is tested in Tables 6.5 through 6.10. For each of these tables, cases that are consistent with the hypothesis are located on or below the diagonal stretching from the upper left hand corner to the lower right hand corner. Cases that are above this diagonal are not consistent with the hypothesis and would be fatal to the hypothesis unless there was some satisfactory explanation of deviancy.

The tables show that cases are generally consistent with the hypothesis but that there are a number of deviant cases. The contrast of internal warfare with external defensive warfare (Table 6.5) revealed a single deviant case, the Jemez. The Jemez was a pueblo society that was in some ways subject to the rule of Spanish authorities. During the focal period, the King of Spain was trying to establish direct rule over the pueblo societies that existed in what is now northern Mexico and southwestern United States.

My initial codes reflected this. I coded the level of sovereignty in internal warfare (i.e., warfare between the pueblos) as the state level. The reason for this code was that the Spanish tried to suppress feuding and warfare between the pueblos over which they were nominally sovereign. Upon reexamination of this case, however, it is doubtful

Table 6.5: Constrasting Levels of Sovereignty: External
Defensive Warfare and Internal Warfare

External Defensive Warfare[b]	Internal Warfare[a]				
	no levels	residential	district	province	state
no levels	2	0	0	0	NA[c]
residential	2	7	0	0	NA[c]
district	0	2	5	0	NA[c]
province	0	0	1	1	NA[c]
state	NA[c]	NA[c]	NA[c]	NA[c]	NA[c]

N= 20

[a] What is the level of effective sovereignty in the society with respect to internal warfare? (level at which warfare with other political communities of the society or sublevels of these political communities can be initiated without serious risk of reprisal by higher levels)
0. no information 1. no sovereignty -- any member of any political community can initiate warfare (usually by raising a raiding party)
2. 1st level: residential site 3. 2nd level: district 4. 3rd level: province 5. 4th level: state (officials at state level take action to suppress internal warfare) 9. not applicable, no internal warfare

[b] What is the level of effective sovereignty in the society with respect to external defensive warfare? (level at which assistance or mobilization can be expected under threat of attack or while under attack) 0. no information 1. no sovereignty -- there is no coordination of defensive effort at residential sites (individuals, families, kin groups must fend for themselves) 2. 1st level: residential site -- defensive effort is coordinated at this level, but residential sites cannot rely upon the assistance of higher levels, if any 3. 2nd level: district 4. 3rd level: province 5. 4th level: state 9. not applicable, no external defensive warfare

[c] Cases were recoded as "not applicable" because internal warfare in states was recoded as "civil" war.

Table 6.6: Contrasting Levels of Sovereignty: External
Defensive Warfare and External Offensive Warfare

External Defensive Warfare[b]	External Offensive Warfare[a]				
	no levels	residential	district	province	state
no levels	1	0	0	0	0
residential	7	10	0	0	0
district	3	4	3	0	0
province	1	0	3	1	0
state	0	0	0	1	8

N= 42

[a] What is the level of effective sovereignty in the society with respect to external offensive warfare? (level at which warfare can be initiated without approval of higher levels) 0. no information 1. no sovereignty -- any member of any political community can initiate warfare (usually by raising a raiding party) 2. 1st level: residential site 3. 2nd level:`district 4. 3rd level: province 5. 4th level: state 9. not applicable, no external offensive warfare

[b] See note b for Table 6.5.

Table 6.7: Contrasting Levels of Sovereignty: External
Defensive Warfare and Judicial/Arbitration Activities

External Defensive Warfare[b]	Judicial/Arbitration Activities[a]				
	no levels	residential	district	province	state
no levels	1	0	1	0	0
residential	9	9	0	0	1
district	0	5	4	0	0
province	0	1	2	2	0
state	0	0	0	0	9

N= 44

[a] What is the effective level of sovereignty with respect to judicial/
arbitration actions? (level above which an appeal cannot be lodged)
0. no information 1. no levels -- individuals and kin groups rarely,
if ever, seek arbitration or judgment by third party 2. 1st level:
residential site -- seek arbitration or judgment by third party, but
decisions of third party cannot be enforced except by informal means
3. 1st level: residential site -- seek arbitration or judgment by
third party, and decisions of third party can be enforced by compul-
sion 4. 2nd level: district -- seek arbitration or judgment by third
party, but decisions of third party cannot be enforced except through
informal means 5. 2nd level: district -- seek arbitration or judgment
by third party, and decisions of third party can be enforced through
compulsion 6. 3rd level: province 7. 4th level: state 9. not
applicable

[b] See note b for Table 6.5.

Table 6.8: Contrasting Levels of Sovereignty: External
Defensive Warfare and the Collection of Taxes, Tribute,
and Labor Services

External Defensive Warfare[b]	Collection of Taxes, Tribute, and Labor Services[a]				
	no levels	residential	district	province	state
no levels	2	0	0	0	0
residential	10	7	0	0	1
district	2	6	3	0	0
province	1	1	1	2	0
state	0	0	0	0	9

N= 45

[a] What is the effective level of sovereignty with respect to levying burdens (taxes, tribute, labor services, other contributions) upon individuals or kin groups? 0. no information 1. no levels -- taxes, tribute, labor services, or other contributions are not levied, except perhaps within kin groups 2. 1st level: residential site -- taxes, tribute, labor services, or other contributions are levied, but there is no compulsion, except for informal mechanisms of social control 3. 1st level: residential site -- taxes, tribute, labor services, or other contributions are levied and there is compulsion 4. 2nd level: district -- taxes, tribute, labor services, or other contributions are levied, but there is no compulsion 5. 2nd level: district -- taxes, tribute, labor services or other contributions are levied and there is compulsion 6. 3rd level: province 7. 4th level: state 9. not applicable

[b] See note b for Table 6.5.

Table 6.9: Contrasting Levels of Sovereignty: External
Defensive Warfare and Police Activities

External Defensive Warfare[b]	Police Activities[a]				
	no levels	residential	district	province	state
no levels	1	0	1	0	0
residential	11	6	0	0	2
district	5	2	2	0	0
province	1	1	1	1	0
state	0	0	0	0	9

N= 43

[a] What is the effective level of sovereignty with respect to police
activities? (level at which physical compulsion can be exercised
against individuals and not effectively countered, except by flight,
hiding, etc.) 0. no information 1. no levels -- police functions are
not specialized or institutionalized at any level, the maintenance of
law and order being left exclusively to informal mechanisms of social
control, to private retaliation, or to sorcery 2. 1st level: residen-
tial site 3. 2nd level: district 4. 3rd level: province 4. 4th
level: state 9. not applicable

[b] See note b for Table 6.5.

Table 6.10: Contrasting Levels of Sovereignty: External
Defensive Warfare and Rule Making/Legislative Activities

External Defensive Warfare[b]	Rule Making/Legislative Activities[a]				
	no levels	residential	district	province	state
no levels	2	1	0	0	0
residential	13	0	0	0	1
district	7	2	3	0	0
province	2	0	1	1	0
state	1	0	0	0	8

N= 42

[a] What is the effective level of sovereignty with respect to rule
making/legislative activities? 0. no information 1. no levels --
there is no written law or penal code; there is no set of rules or
laws that are a formal part of oral tradition; rule making involves
only custom or ad hoc decisions 2. 1st level: residential site
3. 2nd level: district 4. 3rd level: province 5. 4th level: state

[b] See note b for Table 6.5.

whether these Spanish efforts were very successful. This is evident from historical accounts of warfare between Jemez pueblos and between the Jemez and other pueblos against the Spanish (Bandelier, 1892: 211-215). My initial coding of "state" level for internal warfare, therefore, may have been incorrect and might just as well have been replaced by a code that better describes the actual situation--"no levels."

I coded the effective level of sovereignty in external defensive warfare as the residential site level. The reason was that the Jemez and other pueblos had to rely mostly upon their own efforts to defend themselves from attacks by Navahos and Apaches. The efforts by the Spanish to defend the pueblos from these predatory Indians were not particularly extensive or effective.

The contrast of judicial/arbitration activities with external defensive warfare (Table 6.7) revealed two deviant cases: the Dorobo and the Jemez. I discussed the case of the Dorobo above. The district level koret council was a likely example of a vestigial political structure. With regard to the Jemez, an important aspect of Spanish direct rule was judicial/arbitration activities. The Spanish King hoped to substitute law based upon Christian principles in place of native law. An important instrument in this regard was the Spanish priest backed by troops who lived in some of the pueblos on a permanent basis. These priests and troops were not always successful. This is evident from the intermittent revolts by the pueblos against the priests and troops and also by the many failed attempts at religious conversion. It is difficult to know, therefore, whether sovereignty in judicial/arbitration activities actually did lie with Spain.

The contrast of the activities of levying taxes, tribute, and labor services with external defensive warfare (Table 6.8) revealed a single deviant case: once again, the Jemez. Another important aspect of Spanish direct rule was the levying of tribute. These efforts, like judicial/arbitration activities, were not always successful. Such tribute was often a cause of revolt, especially when it was arbitrary or burdensome and Spanish control tenuous.

The contrast of police activities with external defensive warfare (Table 6.9) revealed two (and possibly three) deviant cases: the Dorobo and the Jemez, and possibly, the Chechen. With regard to the Dorobo, the district level koret council apparently also had the authority to see that its judicial decisions were enforced, calling upon young men to do this. The case of the Jemez was discussed above. In some pueblos, Spanish soldiers acted as police. With regard to the Chechen, a transitional situation existed. The Russians were in the process of trying to subjugate the Chechen. Although there is little information on how the Chechen defended themselves, it is apparent that sovereignty in external defensive warfare was the residential site or lower. In the process of trying to subjugate the Chechen, the Russians assigned district police officers to the pacified areas. For this reason, sovereignty in this activity existed at the state level only in the localities that the Russians had already pacified.

The contrast of rule making/legislative activities with external defensive warfare (Table 6.10) revealed two deviant cases, the Chechen and the Jemez. There is inferential evidence that the Chechen had councils of elders. The Jemez, as indicated above, were under partial Spanish control, and because of this, subject to some Spanish laws.

I do not look upon any of these deviant cases as serious challengens to my argument about territorial levels and defense. The Jemez and the Chechen reflect attempts by imperial states to subjugate other societies and impose governing authority. Such attempts were accompanied by stiff resistance. The Jemez case is especially interesting because it illustrates the difficulty that a "sovereign" at a higher territorial level (in this case, the Spanish King) should experience in establishing effective authority when he is doing little or nothing with regard to defense.

(4) Fusing and Problems of Defense. Another thing that should be true of political communities is that increases in the number of their territorial levels should always be linked to problems of defense. To test this hypothesis I recorded instances in the sample societies of processes of fusing, which are the direct causes of such increases.

Fusing occurs whenever a political community loses its autonomy or existence because its officials and members become subject to the authority or become members of another political community. One possible consequence of fusing is an increase in the number of territorial levels. It is important to note that most instances of fusing do not result in increases in territorial levels. For this reason, identification of the causes of fusing is not a sufficient explanation of increases in territorial levels. Nonetheless, if the causes of fusing are always linked unambiguously to problems of external polity, these would presumably be necessary conditions for increases in territorial levels.

For the political communities of the sample societies, I was

able to identify only four basic causes of fusing: defense, conquest and subjugation, forcible relocation, and the concentration of a resource.

The first of these causes, recorded in 25 societies, is fusing for the purpose of defense against a hostile political community or communities. There are at least three ways in which this can happen.

One way this happens is when the members of small, weak, and therefore vulnerable political communities leave them and migrate to larger ones where they will be safer. The erosion of members from such political communities weakens them and encourages further erosion. This process continues until the membership of the political community is entirely dissipated.

This process occurred in North America during the 1800s when the United States tried to establish governmental authority in the West. The members of small and weak Indian groups migrated to the vicinity of forts in order to obtain protection from stronger and more powerful Indian tribes.

A second way this happens is when a small and weak political community migrates as a group to a larger one. While such a political community gains protection for its members, it also loses its autonomy.

This process was observed by Napoleon Chagnon (1979a) in his study of the Yanomamö Indians of southern Venezuela and northern Brazil. He found many cases of small villages migrating as a unit to larger villages to seek their protection. In doing this, however, the men of such small villages subjected themselves to harassment and exploitation by the men of the large villages who used the situation to steal their wives.

A third way this happens is by alliance. Those political communities that are threatened by a common enemy coordinate their defensive activities. If the threat is serious or prolonged the military units of the allied political communities may lose their distinctiveness. This can happen if the military units of one of the allied political communities are defeated and in their weakened condition join up with those of the ally, losing their autonomy. This can also happen if an official or officials exploit the situation to usurp control over the military units of the allied political communities by consent, negotiation, intrigue, intimidation, or some other method. In either case, one of the allied political communities has lost its autonomy because its military units are no longer under the control of one of its own officials.

Fusing by alliance was observed in 7 societies. Invariably, the proximate stimulus for such fusing was a powerful threat of a highly centralized political community that was attacking to conquer and subjugate. Examples include the Guro (the French), the Nama (the Herero and whites), the Falasha (the Amhara), the Chechen (the Russians), the Jemez (the Spanish), the Botocudo (the Portuguese), and the Chichimeca (the Spanish). For the Guro, the Nama, the Falasha, and the Chechen such fusing by alliance seems to have resulted in political communities with an additional territorial level. For the other societies, however, it did not.

The overall incidence of fusing for the purpose of defense was highest in those societies in which political communities had two territorial levels; it was lowest in those in which the political community had four territorial levels. This may indicate that this

type of fusing is a possible cause of increases in territorial levels
of political communities with one and two levels but not of those with
three and four levels.

A second cause of fusing, recorded in 15 societies, is fusing by
means of conquest and subjugation. This occurs when a political
community defeats an enemy and annexes its property, population, and
territory. In my sample, fusing by conquest occurred only in political
communities with multiple territorial levels and most commonly in
those with four levels (i.e., states).

In a number of societies this type of fusing was an identifiable
and immediate cause of an increased number of territorial levels in
political communities: Kuba, Songhai, Ahaggaren, Siamese, Okinawans,
Gujarati, Tongans, Inca, and Aztec. Of these societies, the Kuba,
Songhai, Inca, and Aztec are well known examples of state formation by
means of conquest.

The evidence from this sample, although limited, is entirely con-
sistent with the conquest theory of state formation. I was unable to
record any example of a transition to a four level political commun-
ity by any means other than conquest. It is important to note, how-
ever, that conquest is also a cause of fusing among political communi-
ties with fewer than four territorial levels (although not in politi-
cal communities with only a single level).

The apparent fact that offensive warfare is a major (or perhaps
the only) cause of states seems to contradict my hypothesis that terri-
torial levels exist for defensive purposes. In the context of unstable
balance of power races, however, a political community may confront
competitors whose property, population, and territory is growing as a

result of conquest. To counter these increasing threats and to defend itself it needs to do the same.

It is arguable, therefore, that a major reason for subjugating defeated enemies is to secure their property, population, and territory and use these for defensive purposes. An obvious historical example is the Soviet Union's subjugation of Eastern European countries that were occupied by the Red Army at the end of World War II. These countries were presumably seized because they would be valuable buffers and allies in the event of any future attacks from the West.

A third cause of fusing, nearly identical to fusing by means of conquest and subjugation, is forcible relocation that occurs as a result of pacification or as a result of the defeat and destruction of political communities. Fusing of this type was observed in 14 societies. Some examples include the Winnebago, the Tachi, and the Kiowa who were more or less forcibly removed from their ancestral territory to reservations. In every case the political communities of the society, if they did not become extinct, lost their autonomy.

A fourth cause of fusing, recorded in 13 societies, is the concentration of a particular resource. This can result in either a temporary or a permanent fusing of political communities. It can occur for a variety of reasons. The Dorobo retreated under the pressure of more powerful tribes to a forested area of central Kenya that had not yet been cut down for grazing and agriculture. The Madan were periodically forced by floods to live together on the small habitable islands that were not completely inundated by marsh water. Many of the Koita moved from villages on the tops of coastal hills to Port Moresby, a local trading center.

The concentration of a resource was also responsible for temporary or seasonal fusing. Examples include the Plains Indians who gathered together for large communal buffalo hunts or for the ceremonial summer sun dance. Such gatherings may also have afforded better protection during the most vulnerable summer and fall months.

Fusing because of the concentration of a resource was not widespread in the sample societies and did not seem to be a potent cause of greater numbers of territorial levels. When fusing was permanent it was on a small scale, so that territorial levels were not added. When fusing was temporary or seasonal, such as occurred among the Plains Indians, it is questionable whether this resulted in the addition of territorial levels, although in some cases this did seem to happen. An example is the taime keeper of the Kiowa who seemed to possess "tribal" wide authority during the summer sun dance. In this case it was difficult to tell whether the tribal encampments during such times constituted a single or multiple residential sites. The tribal wide authority of the taime keeper was also temporary, not permanent. In my sample, therefore, it is somewhat doubtful whether the concentration of a resource was for any society a direct cause of the permanent addition of territorial levels to political communities.

Degree of Concentration/Dispersion of Sovereignty Among Territorial Levels. This dimension of centralization refers to the distribution of sovereignty among the territorial levels of political communities. It should also affect the capability of political communities to defend themselves.

I measured this dimension by identifying the level of sovereignty in various activities within political communities of the sample

societies. I used this information to classify societies into one of eight different categories. The basis for these was my hypothesis that the degree of concentration/dispersion of sovereignty among territorial levels affects the capability of political communities to defend themselves, but that some activities are more important in this regard than others.

The activity in which the degree of concentration/dispersion of sovereignty is likely to have the greatest effect upon the adequacy of defenses is external defensive warfare. A political community in which sovereignty in this activity is dispersed among lower territorial levels should be less able than others to construct defensive fortifications, to recruit, train, and equip military units, and to conduct effective defensive warfare.

To illustrate this point, imagine the hypothetical situation in which sovereignty in defensive warfare is located at lower territorial levels or subdivisions. The number of warriors available to each of the subdivisions for its own defense would always be smaller than the number that would be available if all of the subdivisions pooled their strength and cooperated to defend the entire political community. A single subdivision, defending itself, would always be easier to defeat than the entire political community. Although the officials of the subdivisions might try to solve their defensive problems by asking each other for assistance in time of need, one or more officials might refuse to help or might refuse to allow their military units to come under the authority of a single commander. An imaginary political community like this would succumb quickly to any better organized competitor.

The degree of concentration/dispersion of sovereignty in internal warfare also has defensive implications. Internal warfare is waged against political communities of the same society only a short distance away. The location of sovereignty at the highest territorial level in this activity should be advantageous because officials at that level can prevent unauthorized attacks by military units at lower levels upon other political communities. Such attacks are likely to invite retaliation, and if they occur at the wrong time, the political community may have trouble preparing its defenses.

The degree of concentration/dispersion of sovereignty in external offensive warfare also has defensive implications, for the same reason. An unauthorized attack will invite retaliation. The importance of sovereignty existing at the highest level in this activity, however, may be somewhat less than in internal warfare. In some cases, external offensive warfare may be waged with a distant political community, minimizing the risks of retaliation.

I would hypothesize that the degree of concentration/dispersion of sovereignty with regard to judicial/arbitration activities and the collection of taxes, tribute, and labor services are of about equal importance. The location of sovereignty in judicial/arbitration activities at the highest territorial level may be advantageous since there will be a mechanism for appealing disputes that cannot be resolved at lower territorial levels. Such disputes, if not resolved, might result in the outbreak of feuds and civil war which can be the direct causes of fissioning.

The location of sovereignty in the collection of taxes, tribute, and labor services at the highest territorial level may be advantageous

because political officials at that level will be able to secure resources necessary to sustain themselves, their retainers, and most especially, professional military units. Resources will also be available to improve upon and coordinate defensive preparations for the entire political community.

The location of sovereignty in police activities, rule making/ legislative activities, and religious activities should be less critical and possibly irrelevant to defense. There may be no serious disadvantage to a political community if sovereignty in these activities is shared between levels, exists at lower levels, or does not exist.

My hypothesis regarding this dimension of centralization provides a basis for classifying societies into eight categories. Societies with the most centralized political communities are those in which sovereignty in external defensive warfare, internal warfare, external offensive warfare (for societies in which these are relevant) as well as judicial/arbitration activities, the collection of taxes, tribute, and labor services and one other activity is located at the highest territorial level. In the second category, political communities have all of the structural characteristics of those above except that sovereignty in one other activity is either located at a lower territorial level or does not exist. In the third category sovereignty in judicial/arbitration activities or in the collection of taxes, tribute, and labor services (but not in both) is located at a lower territorial level or does not exist.

In the fourth category, sovereignty in both judicial/arbitration activities and in the collection of taxes, tribute, and labor services

is located at a lower territorial level or does not exist. In the fifth category, sovereignty in offensive warfare does not exist at the highest territorial level but sovereignty in at least one other activity does. In the sixth category, the highest territorial level only holds sovereignty in external defensive warfare and internal warfare (where these are applicable). In the seventh category, the highest territorial level holds sovereignty in defensive warfare but not in internal warfare. Finally, in the least centralized political communities, the highest territorial level does not hold sovereignty in external defensive warfare and internal warfare (where these are applicable).

To test my hypothesis about the relevance of this dimension of centralization to defense I looked at the relationship between this measure and strategic success. Table 6.11 shows that this relationship was positive. The number of societies upon which adequate information existed, however, were too few in relation to the number of cells in the table to determine whether the relationship might have occurred as a result of chance.

The table, nevertheless, suggests a number of things about this dimension of centralization and its significance for defense. One point is that the concentration of sovereignty at the highest territorial level is no guarantee that a political community will be able to defend itself. One of the sample societies had political communities that were highly centralized in this regard -- the Thonga -- but lost territory/ autonomy in any case. Not surprisingly, the Thonga lost to the Zulu, a political community in the same category.

A second point is that the location of sovereignty in external defensive warfare at the highest territorial level appears to be a

Table 6.11: The Degree of Concentration of Sovereignty
Among Territorial Levels and Changes in Territory/
Autonomy

Concentration/Dispersion of Sovereignty Among Territorial Levels	Changes in Territory/Autonomy		
	Increases	Stationary or Break Even	Decrease
(D+I+O)+J+T+ one other	5	5	1
(D+I+O)+J+T	0	2	0
(D+I+O)+J or T	2	4	1
(D+I+O)	0	3	0
(D+I)+ other than O	1	1	1
(D+I)	1	3	1
D only, not I	1	0	2
No or other sovereignty	0	1	2[a]

N= 37

phi= .47
p> .10

Symbols: D= external defensive warfare; I= internal warfare; O= external offensive warfare; J= judicial/arbitration activities; T= collection of taxes, tribute, and labor services

(   )= if the activity is applicable to the society

[a] the Jemez were not included in this table because of uncertainty regarding their classification

necessary condition if a political community is to defend itself, retain
its territory and autonomy, and survive. There were four societies in
which this was not true -- the Dorobo, the Selung, the Manihikians, and
the Jemez. Only one of these societies, the Manihikians, had territory/
autonomy that was stationary or breaking even. This was due, as I
indicated above, to its isolation in the South Pacific. This point is
consistent with the hypothesis set out above that of all political
activities the most critical in regard to this dimension of central-
ization is external defensive warfare.

The second most important activity in regard to this dimension
of centralization, as I have argued, should be internal warfare. Of
the three societies in which such sovereignty did not exist -- the
Dinka, the Tasmanians, and the Chichimeca -- internal warfare was endem-
ic. The permanent hostilities that such attacks engendered may have had
fatal consequences for the Tasmanians and the Chichimeca. The politi-
cal communities of these societies were unable to unite effectively when
they were confronted by common and more powerful enemies. The Tasmanians
were hunted down like wild animals by Australian convicts who had emi-
grated to their island. The Chicimeca suffered a similar fate at the
hands of the Spanish.

The third most important activity in regard to this dimension of
centralization should be external offensive warfare. Political commun-
ities that are able to prevent unauthorized attacks upon other societies
are less likely to suffer the effects of unexpected retaliation. The
concentration of sovereignty in external offensive warfare, therefore,
enhances the ability of political communities to defend themselves. In
my sample, political communities that were centralized in this regard

(i.e., D+I+O) attacked just about as frequently as other political communities (phi= .26 p > .10, N= 25) but were attacked much less frequently (phi= .66, p < .05, N= 22).

There were 14 societies in which sovereignty in external offensive warfare was located at a lower territorial level or did not exist. For six of these, I have already identified plausible reasons for losses of territory/autonomy. The lack of sovereignty in external offensive warfare would only compound their problems.

Of eight remaining societies, two -- the Ahaggaren and the Bohogue -- actually gained territory/autonomy, contrary to my hypothesis. The reason for their success, however, was due to the type of offensive warfare they waged. The Bohogue sent out war parties on horse. Since such war parties could raid distant tribes, there was little risk of retaliation. The Ahaggaren sent out war parties on camel to raid caravans and pastoralists of their goods and cattle. The mountainous and desert terrain in which they lived and from which they launched their raids lessened the risks of retaliation.

The territory/autonomy of four other societies -- the Babwa, the Bungi, the Pima, and the Wukchumni -- did not change substantially. The political communities of the Bungi and the Pima were threatened more or less continuously, but enemy attacks did not occur for purposes of land or conquest. For this reason, unauthorized attacks were not likely to greatly increase the danger of retaliation.

The two societies that lost territory/autonomy -- the Guro and the Nama -- did so largely because they were militarily ineffective against their enemies, the French and Herero, who possessed firearms. In both of these societies political communities formed alliances to

meet these threats. This resulted in fusing, the emergence of military leaders, and the formation of rather fragile political communities with an additional territorial level. A possible factor contributing to the losses of territory/autonomy of these societies was the failure of their political communities to coordinate offensive actions against their enemies.

Other activities relevant to this dimension of centralization, as I argued above, are judicial/arbitration activities and the collection of taxes, tribute, and labor services. Societies with political communities in which sovereignty in these activities was located at the highest territorial level were better able than any others to defend themselves. Only one of fourteen societies with these centralization characteristics, the Thonga, lost territory/autonomy. As I indicated above, the Thonga were the victims of the Zulu who conquered large areas of what is now South Africa and incorporated these into a state.

I argued above that the significance of sovereignty in judicial/ arbitration activities being located at the highest territorial level was that this would lessen the chances that disputes between individuals, groups, and officials of different territorial subdivisions would escalate and result in feud or civil war. Such disputes could be resolved peaceably by arbitration or judicial decision of an official at the highest territorial level.

This is a difficult hypothesis to test. Sovereignty at the highest territorial level might just as well be a consequence of more disputes between subdivisional levels within multi-levelled political communities. Sovereignty exists at the highest territorial level because it is needed there. An examination of the relationship between sovereignty at the

highest territorial level and fissioning due to social/political exploitation (see Chapter 7) revealed no relationship at all (phi= .00, p > .10, N= 34). The incidence of fissioning was neither greater nor less when sovereignty in judicial/arbitration activities was concentrated at the highest territorial level.

The anthropologist Elman Service (1975) has emphasized that an important benefit of complex political communities such as states is the existence of an authority who is able to insure a final resolution of disputes so that individuals and kin groups do not need to resort to private retaliation and feud. While this is undoubtedly true, the direction of causality is probably the opposite of what Service implies. It is plain that individuals and kin groups would not need to resort to private retaliation and feud if there was no need to live in populous political communities in the first place.

The anthropologist Ronald Cohen (1978) has argued that a distinguishing feature of states is that they do not fission as regularly as do complex political communities. While there is some truth to this argument, it is plain that there is nothing intrinsic to states that prevents fissioning. In my sample of societies it was endemic in states.

It seems plausible that problems of maintaining order, punishing delicts, and settling quarrels multiply as political communities become more populous. This would be particularly true if the political community included diverse ethnic, racial, occupational, and religious groups as a result of conquest and subjugation. If sovereignty in judicial/arbitration activities were not located at the

highest territorial level, the likelihood of feuding and civil war would be even greater than they would be otherwise. A political community that is disrupted by feud and civil war increases its vulnerability to external attack.

An example from my sample is the Gujarati. The Gujarati gained autonomy from the Mughal empire early in the 16th century. Under able leadership the state of Gujarat was able to extend its territorial holdings by conquest. In 1572-1573, however, local nobles began fighting among each other. Their disputes were not resolved, and the state was threatened with civil war. One of the disaffected nobles formed an alliance with the Mughal emperor, Akbar, who attacked Gujarat and conquered and annexed it.

I also argued above that the significance of sovereignty in the collection of taxes, tribute, and labor services being located at the highest territorial level is that this makes it possible to recruit, equip, and train larger military units. It also makes it possible to have professionals within military units. These advantages would be most important in the most centralized political communities such as states where defensive problems are more serious because of the nature of warfare. I tested these hypotheses and found some support for them. The relationship between sovereignty in the collection of taxes, tribute, and labor services being located at the highest territorial level and size of military units was large (phi= .65, $p < .05$, N= 24), as was the relationship with professionals within military units (phi= .38, $p > .10$, N=41).

Polarity

I will use the concept of polarity to refer to the distribution of sovereignty among individuals and groups within a political community. This use of the word may be somewhat confusing to political scientists because of its appearance in other contexts. The concept was first introduced into political science by Giovanni Sartori (1976) who used it to contrast the party systems of different countries. In a unipolar party system, competition involves a single ideological or social dimension. In a multipolar party system, however, this competition involves multiple and non-overlapping dimensions.

I will use the concept in a different way than Sartori. First, I will look at "activity specific" polarity, a measure of the concentration/dispersion of sovereignty in specific political activities. Second, I will look at "general polarity," an overall measure of the concentration/dispersion of sovereignty within political communities.

With regard to activity specific polarity, a unipolar activity is one in which sovereignty is held by a single individual. A multipolar activity is one in which sovereignty is shared among individuals and/or groups or an activity in which sovereignty does not exist. With regard to general polarity, a unipolar political community is one in which sovereignty in all military activities is held by a single individual (or group). In a multipolar political community sovereignty in military activities is dispersed among individuals and/or groups.

Polarity is presumably significant to the strategic success of political communities for much the same reason as centralization -- like centralization, it is related to the effectiveness of defenses. Arguments about polarity, therefore, may be quite similar to

arguments about centralization.

Polarity and centralization, although conceptually distinct, are positively correlated. This is to be expected if both of these structural characteristics are the consequence of problems of external polity. The correlation between general polarity and number of territorial levels is moderately high (phi= .53, p < .05 N= 39) and in the predicted direction. Unipolar political communities tend to have a greater number of territorial levels. The correlation between general polarity and the concentration/dispersion of sovereignty among territorial levels is much higher (phi= .85, p < .01 N= 39). This is not particularly surprising since if a given polarity condition exists, for example (D+I+O), the same centralization condition also necessarily exists. In only 5 of 39 societies did general polarity differ from the concentration/dispersion of sovereignty among territorial levels.

Polarity is unlike centralization, however, in that it also reflects the effects of internal struggles for power, and these have consequences that may or may not be advantageous to the strategic success of political communities. For this reason, polarity may be less significant than centralization to the survival and growth of political communities.

Activity Specific Polarity. This dimension of polarity is an indicator of the concentration/dispersion of sovereignty in specific political activities. To measure it, I identified the different ways in which sovereignty in particular activities was distributed. There are at least six possibilities. First, sovereignty may be held by a single individual who is (possibly) assisted or influenced by advisors. An example is the authority of the President of the United States to order

military action in response to an enemy attack. Second, sovereignty may be held by several individuals (e.g., a plural executive). An example is the multi-member judicial panels of state and federal appeals courts. Third, sovereignty may be held by a council, assembly, or deliberative body. An example is the system of checks and balances in the United States that grants legislative powers to Congress but gives the President the veto. Fifth, sovereignty may be popular in the sense that it is held by all or nearly all of the adult members of a political community acting together. A classic example is the New England town meeting. Sixth, and finally, sovereignty may not exist. An example is the absence of anyone in the United States and other secular states with final authority in religious activities.

With regard to activity specific polarity, a situation of unipolarity exists whenever a single individual holds sovereignty. All other situations reflect degrees of multipolarity. For example, a committee involves less sharing of authority and less multipolarity than a large council. In the case of no sovereignty there is extreme multipolarity in the sense that sovereignty is dispersed among all individuals and groups.

I would argue that unipolarity is of substantial importance to the strategic success of political communities only in military activities, especially those linked with defense. As regards defensive sovereignty, as I showed in Chapter 5, the most effective military practice is for a single individual to coordinate defensive activities. A response to enemy attack that is slow and uncoordinated, as can occur when several individuals and/or groups have to agree before military action is taken, may result in defeat.

Table 6.12: Activity Specific Polarity

	Activity (Percent)							
	D	I	O	J	T	P	L	R
single individual + advisors (if any)	80	76	48	49	45	42	16	31
plural executive, a committee	5	5	5	6	2	2	2	3
council, assembly, deliberative body	7	5	5	13	4	8	10	2
single individual + council, assembly, deliberative body	2	0	10	9	7	4	14	2
popular sovereignty	0	0	0	0	4	0	0	0
no sovereignty	5	14	31	21	39	42	59	64
other[a]	0	0	2	2	0	2	0	0
totals	99[b]	100	101[b]	100	101[b]	100	100	100
N	41	21	42	53	56	52	51	58

[a] temporary sovereignty; individuals were designated as sovereigns but did not constitute a plural executive, committee, or council

[b] percents do not add to 100 because of rounding

Symbols: D= external defensive warfare; I= internal warfare; O= external offensive warfare; J= judicial/arbitration activities; T= collection of taxes, tribute, and labor services; P= police activities; L= rule making/legislative activities; R= religious activities

The importance of having a single individual as sovereign during wartime is recognized in the constitutions of many nation states which designate a President, Prime Minister, or other executive as the commander-in-chief of the armed forces. Constitutions may also grant various emergency powers that are seen as potentially critical to the defensive effort.

To test this hypothesis I gathered information on the distribution of sovereignty in eight different political activities. Table 6.12 presents the results of this analysis. It shows, consistent with my hypothesis, that unipolarity (i.e., a single individual as sovereign) was more common in external defensive warfare than in other political activities. For other activities sovereignty was more often shared or absent entirely, indicating greater multipolarity. This is especially true of activities such as rule making/legislative activities and religious activities with presumptively less direct relevance to defense.

One thing that is striking about Table 6.12 is the infrequency of plural executives, councils, assemblies, deliberative bodies and other structured methods of sharing power. Such methods of sharing power occur somewhat frequently in judicial/arbitration activities and in rule making/legislative activities but are generally uncommon. Methods of sharing power as occur in systems of checks and balances, therefore, are not widespread. Such methods are more characteristic of complex, modern political communities than of simple, traditional political communities.

Also noteworthy in Table 6.12 is the extent to which sovereigns in particular activities are identifiable. Some anthropologists such as Morton Fried (1967) have emphasized the "ephemeral" nature of

leadership in simple political communities such as hunter-gatherer groups. The word ephemeral implies that sovereignty is only temporary. I think that this is somewhat misleading. In nearly all of the political communities of the sample societies, whatever their complexity, political positions existed that were identifiable and durable.

A more detailed study of the few sample societies in which unipolarity in external defensive warfare did not exist indicates that the sharing of power in this activity (i.e., multipolarity) makes it difficult to coordinate defensive activities.

One of these societies was the Nama. In the political communities of this society tribal councils were responsible for coordinating defensive activities. These councils had difficulty in uniting the efforts of different lineage segments or kraals. Military units appeared to be poorly led and disciplined. These problems became much more serious after white encroachment and especially after their arch-enemies the Herero acquired firearms.

Another society was the Cebu. In the Philippine Islands responsibility for defense was held jointly by the President of the Philippines and by the President of the United States. During World War II, the island of Cebu was quickly overrun by the Japanese. Due to difficulties of establishing a unified command, it took a year or longer before the efforts of the Philippine resistance were coordinated with those of U.S. armed forces.

Two other societies in which sharing of power in the area of defense occurred were pueblo societies: the Jemez and the Zuni. In Jemez political communities a war chief (or priest) was in theory responsible for defense but in practice he left actual command

to several war captains. The war captains, who alternated in office, were selected by a council composed of the ceremonial societies. In Zuni political communities the bow priesthood was responsible for defense. Recruitment into military units in both Jemez and Zuni was based upon membership in societies linked to different pueblo factions. The consequence of the fractionalization of command and military units in both the Jemez and Zuni cases appears to have been low discipline and rather uncoordinated defensive effort, despite rather extensive fortifications.

The significance of activity specific polarity in other activities is much less transparent. Somewhat less than a majority of societies had political communities in which a single individual was sovereign in external offensive warfare. The same was true of judicial/arbitration activities, the collection of taxes, tribute, and labor services, and police activities, suggesting that unipolarity in these activities is much less critical than in defensive activities.

Unipolarity is presumably of advantage in external offensive warfare for much the same reason that it is of advantage in external defensive warfare. Military actions are more effective if there is a single individual with final authority to initiate and direct them.

For the sample societies, however, it is difficult to detect this advantage. For example, there were several societies in which councils held or shared sovereignty in this activity -- the Kuba and the Aztecs -- that were very successful in offensive military actions.

This highlights once again an important difference between defensive and offensive military actions. Defensive actions nearly always affect a political community's prospects of survival and growth;

offensive actions do not. A political community that fails in an offensive action can try again or try elsewhere. For example, imperial powers such as the Aztecs, the Incas, and the Romans suffered military losses, but these did not prevent them from extending the territories under their control.

A political community may even be at a disadvantage if sovereignty in external offensive warfare is held by a single individual if this person is incapable in some way. A council or other group that holds sovereignty in external offensive warfare may be more prudent and rational in launching attacks than a single individual. For example, General MacCarthur was unable to invade China without the approval of President Truman, and ultimately, of the Congress. If he had been able to do this on his own authority, the United States would have become enmeshed in a costly military action that probably would have failed.

The advantage to a political community of unipolarity in the collection of taxes, tribute, and labor services is also unclear. One possibility is that it is somewhat easier for a single individual than for several individuals and/or a group to authorize, conduct, and supervise such collections. These collections may also be essential to defensive activities. There was no evidence from the sample societies, however, that the sharing of sovereignty in this activity had any impact upon defensive activities. Societies in which sovereignty in these activities was shared (e.g., Iranians, Baiga, Purari, Cebu, Mailu) were few in number and did not seem to be particularly different from other societies in defensive activities.

It is commonly argued that democratic political communities (i.e., multipolar) are less able than dictatorial or totalitarian

political communities to spend on defense. In times of direct threat
to a political community, however, it is unlikely that the sharing of
sovereignty in the collection of taxes, tribute, and labor services
would seriously inhibit defensive effort. A good example is the huge
spending for arms by the United States in World War II.

The advantage, if any, to a political community of unipolarity in
judicial/arbitration activities is unclear. In a substantial propor-
tion of societies -- 28 percent -- sovereignty in these activities was
shared. These activities are not linked directly to defense, so that
the degree of polarity may reflect other contingencies. In particular,
polarity may reflect the outcome of struggles for power within politi-
cal communities.

The advantages to a political community of unipolarity in police
activities is unclear for the same reason. Although these activities
involve the threat of or actual use of force as do military actions,
they are not directly relevant to problems of defense. Polarity in
police activities, therefore, may also reflect other contingencies.

The advantages to a political community of unipolarity in other
activities is even less clear. In legislative activities, for example,
both parliamentary systems in which sovereignty is concentrated in the
majority and presidential systems in which sovereignty is shared can
probably act with equal speed in periods of crisis when the survival
of the political community is at stake. One of the supposed advan-
tages of sharing rule making/legislative activities is to allow a
broader basis of participation in policy decisions so that decisions
that are reached are supported by large numbers rather than by just a
few. Such an advantage, however, is more relevant to problems of

internal than of external polity.

In religious activities, unipolarity presumably makes it possible for a political community to have a unifying spiritual or secular ideology. This seems to be an important cohesive force in some types of political communities, such as theocratic chiefdoms (Service, 1975). It is unclear, however, whether ideology is a cause or a consequence of unity. The association of religion and political ideologies with the growth of large states and empires is so close that it seems more plausible to argue that religion and the unity it fosters is more a consequence than a cause of intergroup competition and conflict. It is noteworthy that political ideologies such as communism depend heavily for their survival on the existence of a credible or manufactured external threat.

General Polarity. This dimension of polarity is an indicator of the overall concentration/dispersion of sovereignty within political communities. Of greatest theoretical interest is the degree to which an individual and/or group holding sovereignty in defensive warfare also holds sovereignty in other activities. My measure of general polarity, therefore, indicates the distribution of sovereignty in relation to the individual and/or group holding sovereignty in defensive warfare.

The method that I used to measure general polarity is much the same as that which I used to measure the degree of concentration/ dispersion of sovereignty among territorial levels. The method results in eight categories. These categories reflect different degrees of concentration/dispersion of sovereignty in relation to the individual and/or group holding sovereignty in defensive warfare.

At one extreme, a highly unipolar political community, sovereignty with regard to external defensive warfare, internal warfare, and offensive external warfare (where these are applicable), judicial/arbitration activities, and one other activity is held by the same individual and/or group. At the other extreme, a highly multipolar political community, there is no sovereignty in external defensive warfare.

Table 6.13 shows the distribution for this dimension of polarity. If a unipolar political community is defined as one in which a single individual and/or group holds sovereignty in all military activities (D+I+O, where these are applicable), 59 percent of the sample societies had unipolar political communities, and 41 percent had multipolar ones.

The significance of general polarity to the strategic success of political communities should be much the same as the significance of the concentration/dispersion of sovereignty among territorial levels. This should be true since, as indicated above, the existence of a particular polarity condition necessarily indicates the same centralization condition.

Table 6.14 shows the relationship between general polarity and changes in territory/autonomy. The table shows that societies with multipolar political communities were much more likely than societies with unipolar political communities to suffer losses in territory/ autonomy. Only two societies with unipolar political communities -- the Thonga and the Botocudo -- suffered losses in territory/autonomy.

The activity in which the concentration/dispersion of sovereignty should be most critical, as indicated in the section on centralization, is external defensive warfare. This seems to be confirmed by Table 6.13 which shows that only 18 percent of the sample societies had political

Table 6.13: Polarity of Political Communities

Concentration/Dispersion of Sovereignty	%	N	Societies
(D+I+O)+J+T+ one other	18	7	Gogo, Inca, Madan, Okinawans, Siamese, Songhai, Thonga
(D+I+O)+J+T	8	3	Atsugewi, Aztec, Kapauku
(D+I+O)+J or T	18	7	Botocudo-J, Goajiro-J, Iran-T, Koita-J, Kuba-T, Luvale-T, Winnebago-J
(D+I+O)	15	6	Purari, Sivokakmeit, Tachi, Tehuelche, Tongans, Zuni
(D+I)+ other than O	5	2	Kiowa, Wukchumni
(D+I)	18	7	Ahaggaren, Babwa, Bohogue, Bungi, Guro, Nama, Pima
D only, not I	13	5	Chichimeca, Dinka, Gujarati, Jemez, Tasmanians
No or other sovereignty	5	2	Dorobo, Selung
Totals	100	39	

Symbols: D= external defensive warfare; I= internal warfare;
O= external offensive warfare; J= judicial/arbitration
activities; T= collection of taxes, tribute, and labor
services

(   )= if the activity is applicable to the society

Table 6.14: General Polarity and Changes in Territory/Autonomy

Changes in Territory/Autonomy

Polarity Condition	Increase	Stationary or Break Even	Decrease
(D+I+O)+J+T+ one other	3	2	1
(D+I+O)+J+T	1	2	0
(D+I+O)+J or T	2	4	1
(D+I+O)	1	4	0
(D+I)+ other than O	1	1	0
(D+I)	1	3	2
D only, not I	1	0	3
No or other sovereignty	0	0	2

N= 35

phi= .52
p> .10

Symbols: D= external defensive warfare; I= internal warfare;
O= external offensive warfare; J= judicial/arbitration activities; T= collection of taxes, tribute, and labor services

(   )= if the activity is applicable to the society

communities in which sovereignty in these activities was not held by a single individual and/or group.

It would also seem to be advantageous to a political community if the sovereign in defense also held sovereignty in offensive warfare. The reasons are probably similar to those in regard to centralization in these activities. If a single individual or group has final authority in all military activities (i.e., (D+I+O)), the political community can coordinate its offensive actions with its defense. Such political communities, in fact, tend to be attacked less frequently (phi= .64, p < .05, N= 20), presumably because they can prevent unauthorized attacks that result in retaliation. Since they are attacked less frequently, such political communities are less likely to suffer losses in territory/autonomy.

It may also be important for a sovereign in defensive activities to also hold sovereignty in the collection of taxes, tribute, and labor services (i.e., (D+I+O)+T). This should make it easier for a sovereign to improve defenses since he will also be able to secure the necessary resources and effort. A test of this relationship shows that it is in the expected direction but is not significant (phi= .35, p > .10, N= 33). Another possibility is that such a polarity condition makes possible larger size military units. A test of this relationship shows that this is so (phi= .75, p< .01, N= 24). Of course, the number of territorial levels is also associated with the size of military units, so that polarity in this case may simply reflect greater centralization. It is noteworthy, however, that this polarity condition does appear to be a necessary condition for large military units (i.e., 1,000 men or more). Such large units must typically be supplied on a sustained

basis by non-combatants. Only one society was an exception -- the Tasmanians -- and the report of large military units in this society may be incorrect or reflect an extraordinary instance of a large, temporary alliance. The polarity condition (D+I+O)+T is also associated with professionals in military units (phi= .38, p > .10, N= 39), although the relationship is not statistically significant.

The significance of general polarity in other activities that are not linked closely to defense is unclear. In these activities general polarity may reflect the outcome of internal struggles for power.

Political scientists, historians, and other social scientists are often puzzled by what the causes are of changes in the relative distribution of political power between groups within societies. There are several general views on this question. One view focuses upon variables that are intrinsic to political communities. The basic idea is that changes in polarity reflect the outcomes of struggles for power within political communities. Another view focuses upon variables that are extrinsic to political communities. The basic idea is that changes in polarity are responses to conflicts between political communities. It is possible, of course, that both of these views are partially correct, and that variables which are both intrinsic and extrinsic to political communities are the causes of increases or decreases in polarity. If this is true, a satisfactory explanation of polarity might be quite complex.

Struggles for power within political communities presumably occur because of the advantages or disadvantages to members of existing power relationships. Those who benefit from such relationships will

struggle to preserve the status quo or will promote changes from which they will benefit to an even greater extent. Those who do not benefit from existing power relationships will struggle against the status quo or will try to stop changes that will hurt them even more.

Such struggles should occur most frequently and intensely when political power is linked to the access, control, and ownership of reproductive resources that are not readily obtained in other ways. Depending upon the outcome of such struggles, polarity can either increase or decrease. I will defer discussion of the impact of these struggles on polarity to Chapter 7.

Intergroup competition and conflict also has important effects on polarity. As indicated above, one important effect is due to inter-polity selection. The polarity of a political community affects its ability to defend itself.

Aside from this effect, however, competition and conflict is also a proximate cause of changes in polarity because of responses to defensive problems. In general, more frequent/intense conflict between political communities should facilitate change in the direction of uni-polarity. This should happen because of the coordination of political activities that occurs because of increased defensive activities. Such coordination is much easier to accomplish if a single individual and/or group holds sovereignty in a wide range of activities. If problems of external polity persist, a sovereign in external defensive warfare may be able to extend his power into additional areas.

Since there is little information on changes in polarity, I cannot test this hypothesis directly. However, I can test to see whether it is consistent with the data on sovereignty.

One test is the relationship between conditions of external polity and polarity. I would argue that the most important condition of external polity that affects polarity is the reason or reasons for enemy attacks. If these reasons include subjugation and/or tribute, or land, the survival of political communities is directly threatened (as well as, perhaps, the lives of its members). The seriousness of such a threat makes it easier for a sovereign in defensive warfare to extend his authority into other activities, since if these are linked in any way to defense, they become more important. Their coordination with defensive activities also becomes more important. In most political communities the only one capable of insuring such coordination will be the sovereign in defensive warfare.

Table 6.15 shows the relationship between the reasons for enemy attacks and polarity. For purposes of this test a unipolar political community is one in which sovereignty in all military activities is concentrated in a single individual and/or group. A multipolar political community is one in which sovereignty in military activities is dispersed or is absent. Results are consistent with my hypothesis. Political communities which are threatened by political communities waging war for purposes of subjugation and/or tribute, or land, are far more likely than other political communities to have a unipolar political structure.

A second test is to examine the extent to which a sovereign in external defensive warfare also holds sovereignty in other activities. My hypothesis is that sovereignty in this activity supplies the pretext for the extension of sovereignty into other activities. If this is true, a sovereign in external defensive warfare should be more

Table 6.15: Nature of External Threat and Polarity

Polarity Characteristics

Nature of External Threat	Unipolar[a] (D+I+O)	Multipolar[b]
Enemy political communities wage war for subjugation and/or tribute, or land	18	9
Enemy political communities wage war for other reasons	4	7

N= 38

phi= .28
p < .01

[a] includes categories one through four of general polarity
[b] incudes categories five through eight of general polarity
[c] refers to either external or internal warfare or both, where applicable

likely to hold sovereignty in other activities than a sovereign in any other activity. Other sovereigns should be less likely to hold sovereignty in other activities since this would reflect the extension of sovereignty from areas other than external defensive warfare. To use an example, I would expect that a sovereign in external defensive warfare would be more likely to hold sovereignty in other activities than a sovereign in police activities.

To determine these probabilities I proceeded as follows: If the same individual (group) sovereign in a particular activity was also sovereign in another activity it was assumed that sovereignty had been extended from the former to the latter activity. If sovereignty did not exist with regard to a particular activity it was assumed that there was no extension of sovereignty to or from that activity. If sovereignty was shared in a particular activity it was assumed that this was a sufficient basis for the extension of sovereignty to other activities. For example, in the Kuba state of Bushoong, sovereignty in rule making/ legislative activities was shared by a king and a crown council. I assumed this to be a sufficient basis for the extension of the king's sovereignty in this activity to other activities such as religious activities, police activities, and others. On the other hand, if sovereignty was not shared in a particular activity but shared in another activity to which sovereignty had been extended, each individual (group) who shared sovereignty was attributed with 1/2 of the total sovereignty. To use the same society as an example, in the Kuba state of Bushoong the king was sovereign in external defensive warfare but shared sovereignty with a crown council in rule making/legislative activities. I assumed that the king's sovereignty in external defensive

warfare accounted for 1/2 of the total sovereignty in rule making/ legislative activities.

Table 6.16 presents the results of this analysis. I expect that a sovereign in external defensive warfare will have a higher probability than other sovereigns of holding sovereignty in other activities. The results are consistent with expectations. The average probabilities are greater for external defensive warfare than for other activities. A sovereign in external defensive warfare is more likely than other sovereigns to hold sovereignty in other activities.

This result is consistent with Herbert Spencer's view (1912:573) that leaders first appeared in the military and that leadership in this area supplied the pretext and the model for leadership in other areas. The reason for this is presumably due to the importance of defensive warfare to the survival of political communities. A sovereign in this activity was able to extend his authority to other activities as they became important because of their linkage to defensive activities. In this regard it is noteworthy that a sovereign in external defensive warfare is more likely to also be a sovereign in activities which on the face of it have more direct linkages to defensive activities such as internal warfare, external offensive warfare, and the collection of taxes, tribute, and labor services than in activities with less direct linkages.

Summary

A variety of evidence is consistent with the hypothesis that the activities and structures of political communities are in large measure a consequence of problems of defense. The activities which are most

Table 6.16: Sovereignty and Its Extension

		If Sovereign in:							
		D	I	O	J	T	P	L	R
	D	–	.81	.50	.36	.38	.26	.20	.14
	I	.81	–	.53	.36	.26	.18	.14	.15
Probability	O	.47	.53	–	.34	.33	.23	.26	.13
Also Sovereign in:	J	.35	.34	.31	–	.29	.23	.19	.09
	T	.38	.26	.35	.31	–	.27	.23	.14
	P	.27	.18	.26	.25	.27	–	.17	.11
	L	.16	.14	.23	.19	.21	.14	–	.11
	R	.13	.15	.13	.10	.13	.10	.12	–
Average Probability:		.36	.34	.34	.28	.29	.22	.21	.13

Symbols: D= external defensive warfare; I= internal warfare; O=
external offensive warfare; J= judicial/arbitration activi-
ties; T= collection of taxes, tribute, and labor services;
P= police activities; L= rule making/legislative activities;
R= religious activities

Sample Sizes: The sample sizes upon which probabilities were cal-
culated range from 15 to 57.

Note: Probabilities are not symmetric in every case because of
the different ways of attributing the extension of sover-
eignty when sovereignty was shared.

prominent within political communities -- external defensive warfare

and political recruitment -- are those which are most essential to

their defense. The activities in which sovereignty is most promin-

ent -- external defensive warfare and internal warfare -- are those

in which the absence of sovereignty would nearly always generate

serious defensive problems.

The most important characteristics of the structure of political

communities are centralization and polarity. Centralization has three

dimensions: the number of distinct territorial levels, the degree of

concentration/dispersion of sovereignty among territorial levels, and

the degree of control/autonomy of higher territorial levels over the

activities of lower territorial levels. The dimension that most

affects a political community's ability to survive, however, is its

number of territorial levels. Sovereignty in external defensive war-

fare is almost always located at a territorial level as high or higher

than any other activity. The proximate causes of increases in the

number of territorial levels seem almost invariably to be linked to

problems of external polity. This suggests that territorial levels

exist for purposes of defense and not for other reasons.

With regard to polarity, sovereignty appears to be most highly

concentrated in external defensive warfare and internal warfare --

two activities with direct linkages to problems of defense. A politi-

cal community that is under the threat of conquest and subjugation

or of loss of land appears to be somewhat more likely than other

political communities to acquire unipolar characteristics. Sovereign-

ty is apparently extended from defensive activities into other activ-

ities because of the problems that arise when political communities

try to defend themselves.

It would appear, therefore, that political structure is largely a result of competition and conflict between human groups. Although there are many causes of this competition, these are all linked in one way or another to hostile forces such as land, food, and mate shortages. Variations in political structure affect the relative success of political communities in warfare. They also affect the survival and reproduction of individuals and in some unknown way the evolution of human traits.

CHAPTER 7

PROBLEMS OF INTERNAL POLITY

In this chapter I look at the causes of competition within politi-
cal communities and its consequences for political activities and
structures. I argue that the causes of competition are directly attri-
butable to the costs to individuals of living within political communi-
ties. From the evolutionary perspective, "costs" are social conditions
that diminish survival and/or inhibit reproduction. Among these costs,
the most important is scarcity of resources. I also look at the conse-
quences of competition within political communities. These include
the extension of political sovereignty, the growth of kinship based
coalitions, the appearance of social stratification, intensified
competition for political offices, and fissioning.

Causes of Competition

The causes of competition within political communities are both
direct and indirect. The direct cause of competition is scarcity of
resources important to survival and reproduction. Resources like
cattle, food, land, mates, shelters, and tools are in short supply.
We can suppose that natural selection in human evolutionary history
favored the spread of the genes of individuals who competed success-
fully for these resources. Such individuals would have had greater
survival and reproductive success.

263

The indirect causes of competition include all of the economic, social, and political conditions that result in scarcity of resources. These conditions are due to a multiplicity of factors. Among the most important, however, are warfare, ecological factors (including technology), population growth, and the characteristics of social life within political communities. We can suppose that natural selection also favored the spread of the genes of individuals who for one reason or another lived under economic, social, and political conditions associated with abundant (or less scarce) resources.

It is important to recognize that life within all types of social groups, including political communities, has both advantages and disadvantages (Alexander, 1974). The disadvantages of life in social groups, such as increased susceptibility to diseases and parasites and more intense competition for resources, are centrifugal forces. In the absence of compensating advantages, they discourage the evolution of group living in solitary species and encourage its loss in social species.

The disadvantages of life in political communities, because of our familiarity with them, often escape notice. Modern medicine and sanitation have insulated us from many of the effects of increased susceptibility to diseases and parasites. Many of the activities of political communities that diminish the personal liberty and resources of individuals are taken for granted. Legislative activities establish codes that proscribe certain behaviors and establish punishments for violations. Police activities result in the loss of privacy and in the direct supervision of behavior. The collection of taxes,

tribute, and labor services diminishes the individual's stock of resources. The recruitment of military personnel can result during wartime in dangerous military service. These disadvantages are centrifugal forces that promote the fissioning or breaking up of political communities.

Scarcity of Resources.

The direct cause of competition within political communities, as I argued above, is scarcity of resources important to survival and reproduction. Things that enhance the inclusive fitnesses of individuals are in short supply. Individuals compete with others to obtain a disproportionate share of these important resources for themselves.

Scarcities are an omnipresent fact of life for all species whether social or not. In social species, however, scarcities are aggravated by higher population densities and more intense exploitation of resources. It is also significant that competition in social species occurs between conspecifics who occupy the same niche and use the same resources. In solitary species the principal competition may be individuals of other species.

It is reasonable to suppose that social conflict in political communities should occur over resources that are both scarce and also critical to human survival and reproduction. In this regard it would seem that social conflict over mates and over important economic resources like land and cattle should be fairly common.

To gauge the relative scarcity of different resources within the sample societies and the effects of this on social conflict, I gathered information on the incidence and resolution of disputes of

various types. Variation in the incidence of disputes is presumably an indication of the relative scarcity and importance of different resources.

Although the ethnographic literature contains substantial information on disputes within the sample societies, in most cases, this information was not systematically collected. As a result, the disputes that are observed and recorded by ethnographers are not a representative sample but rather reflect those thought by ethnographers to be important and worth recording. Also, much of the information is general in nature, based upon statements of informants as to how particular disputes are resolved.

In spite of these problems, the information contained within ethnographies probably gives at least a rough picture of the relative incidence of disputes, especially of those that are more important and therefore more likely to be observed and noted. Table 7.1 shows the relative incidence of 19 different types of disputes within the sample societies. I lumped the 19 disputes more or less arbitrarily into four different general categories. I also included a residual category for other types of disputes.

The table shows that personal attacks were the most common types of disputes mentioned in the ethnographic literature. In most cases, personal attacks are not random but result from a dispute over something. It is my impression, although I lack systematic evidence, that most personal attacks, especially those resulting in murder, arise in connection with disputes over women. The attention paid to murder in the ethnographic literature is undoubtedly due to its importance. Almost uniformly, murder is regarded as an

Table 7.1: Frequency of Disputes

	Percent of Disputes	Number
Personal Attacks:		
accidental killing	4	
assault	4	
insult	3	
murder	14	
rape	2	
sorcery/witchcraft	6	
	34	(191)
Property Disputes:		
destruction of property	3	
inheritance	1	
land encroachment, trespass	5	
theft of livestock, horses	2	
theft of property	11	
	22	(121)
Public Delicts:		
evasion of labor services, taxes, tribute	2	
incorrigibility	2	
violation of marriage restriction, incest taboo	4	
violation of sumptuary law, taboo, prohibition	4	
	12	(68)
Sexual/Marital Disputes:		
adultery: cuckoldry	8	
adultery: philandering	8	
desertion of mate	4	
theft of mate	3	
	24	(132)
Other Disputes:	9	(49)
Total	100	(561)

especially serious delict, requiring retaliation or official action.
Obviously, murder results in a direct reduction in the inclusive
fitness of the victim and also that of his relatives. In simple
political communities it is a common cause of feud and sometimes of
fissioning.

The next most common types of disputes were sexual/marital
disputes, and especially, adultery. An act of adultery typically
generates two disputes: a dispute between the wife and the cuckolded
husband, and a dispute between the philanderer and the cuckolded
husband. Due to the prevalence of the so called "double standard,"
an act of adultery quite often does not lead to a dispute between
the philanderer and his wife (if any). An act of adultery is
presumably regarded by cuckolded husbands as a serious delict because
it is a direct threat to their inclusive fitness. If the wife
becomes pregnant, she will give birth to children whose genetic
father is the philanderer.

The next most common disputes were property disputes. Theft was
most commonly mentioned; land encroachment was mentioned somewhat
less often.

These data on the relative incidence of disputes suggest that
social conflict does commonly arise over resources that are important
to inclusive fitness. What is particularly noteworthy, although
it is not demonstrated in the table, is the endemic nature of con-
flict. The same types of disputes -- especially those that arise
from murder, theft, and adultery -- are common causes of social
conflict in almost all types of societies, regardless of their
degree of complexity. The hunter-gatherer, no less than the modern

city dweller, suffers from assault, theft, and adultery. Also, it
is noteworthy, although hardly surprising, that social conflict is
not purposeless or random but rather reflects a struggle for scarce
reproductive resources.

Warfare

Warfare has several indirect effects on competition within
political communities. One of these, interpolity selection, dimin-
ishes the overall incidence of competition in political communities.
Another indirect effect, population nucleation, generates economic,
social, and political conditions that intensify competition.

Interpolity Selection. One of the most important conse-
quences of warfare is the destruction of political communities or
what might be called interpolity selection. To survive in warfare,
as I argued in Chapter 5, a political community must use military
practices that are more effective than its enemies.' Many of these
practices are possible or become effective only if the members of
a political community stop competing with each other. For exam-
ple, the use of a complex tactical formation like the line is
effective only if warriors hold their positions in battle and do not
try to obtain personal glory. Defensive fortifications such as
stockades and watchtowers are effective only if individuals do not
tear them down and use the materials for private purposes. An in-
crease in the size and quality of military forces is possible only
if political officials do not divert the revenues they collect for
private purposes.

Since interpolity selection favors the survival of political communities that use effective military practices, it also favors the spread of political communities in which individuals refrain from competing with each other to the extent that this makes possible the use of such practices. The characteristics of surviving political communities should reflect this. Competition should be least intense in activities that are linked directly with warfare and most intense in activities that are linked only indirectly or not linked with warfare.

In support of this hypothesis, I would contrast the incidence of sovereignty (or final authority) in different political activities. The existence of sovereignty is an indication that competition within political communities has been curbed to some extent. As I showed in Chapter 6, sovereignty was more common in activities directly linked to warfare and defense than in other activities. Also noteworthy is the high degree of subordination that often exists in military units in contrast to the often low degree of subordination in other political structures.

A corollary of this hypothesis is that political officials should not tolerate competition that threatens sovereignty in military activities, since this may threaten the survival of the political community. Also, of course, it may threaten the political officials themselves and all of the privileges they enjoy. An example of this, perhaps, was the imposition of martial law in Poland in 1981. Soviet authorities probably feared the consequences to the unity of the Warsaw Pact if the growth of the Solidarity union was unchecked and it gained sympathizers within

the Polish Army. The positions of Polish military officers, of course, would have been threatened if they had failed to control the troops under their command.

Population Nucleation. Another effect of warfare -- population nucleation -- promotes competition within political communities. Warfare and the threat of warfare increase the danger to small, isolated residential sites that because of their size and location are incapable of effectively defending themselves from attack. Several things can happen. The sites may be attacked and destroyed. Alternatively, the members of such sites may flee to residential sites that are more defensible. The net result is that warfare leads to a decline in the number of residential sites and to an increase in the population of those that are larger and more defensible.

The only societies in which nucleation does not occur are small ones that rely upon hiding or flight for defense (e.g., the Selung), and ones that are capable because of topography, military organization, or technology of defending their territorial boundaries (e.g., Iran). Most of the sample societies, however, were not of these two types.

The possibility that warfare is a cause of nucleation is tested below. My measure of nucleation is urbanization. I divided societies into two groups: those in which the largest residential site had a population of less than 1,000 (low urbanization) and those in which the largest residential site had a population of 1,000 or greater (high urbanization). I set out the hypothesis that

urbanization was most likely to occur in the context of warfare that is waged for political reasons -- for conquest and subjugation. Other reasons do not pose as significant a threat to small, isolated residential sites. Table 7.2 shows that warfare waged for political reasons is strongly associated with urbanization, consistent with my hypothesis.

Nucleation results in increased population densities in localized areas, scarce resources, and intensified competition. This happens because people are unable to effectively exploit resources in areas that are difficult to defend.

A well-known example of nucleation was the migration of much of the rural population of South Vietnam from small hamlets in the countryside to more defensible provincial capitals and coastal cities. This migration generated an enormous number of refugees without any means -- other than begging, drug dealing, theft, black-marketing, and prostitution -- of supporting themselves and their families.

Other less direct effects of nucleation also result in intensified competition and are well known consequences of urbanization. One of these is economic specialization. This engenders economic interdependence, exploitation, and differences in income and wealth between individuals and kin groups. Another effect is increasing susceptibility to diseases and parasites, and food shortages. In most cases urbanization leads to demands for public facilities and services to remedy these problems.

Another effect of urbanization is increased asocial behavior. Such behavior seems to occur because individuals are unable to rely

Table 7.2: Political Reasons for War and Urbanization

Urbanization

Reasons Enemies Wage War	Low	High
Not Political	17	3
Political	6	11

N= 37

phi= .51
p < .01

upon their families and other kin in times of hardship. It also occurs because cities afford increased opportunities for asocial forms of exploitation such as theft. It is a response by the economically, socially, and politically powerless to their relative deprivation. Asocial behaviors within cities lead to increased demands for police, judges, and penal systems.

It is important to recognize that nucleation can occur without population growth, and population growth can occur without nucleation. The latter point is relevant to the observation that the average size of political communities did not grow significantly throughout the entire paleolithic (Carneiro, 1978). As soon as political communities became large, they fissioned or divided into smaller, geographically separate groups.

It is also important to recognize that nucleation is not the result of economic conditions. Many economists would argue that centralized political communities exist because of the advantages of markets, specialization of labor, and trade. For example, Elman Service (1975) has argued that centralized political communities would have arisen in places where a single locality, because of its central location, enjoyed an advantage as a trading and redistribution center. There is no evidence, however, that uncentralized political communities have relinquished their autonomy voluntarily, whether there was economic advantage in doing so or not.

A study by Boserup (1965) is noteworthy because it supports the notion that economic advantages are seldom sufficient by themselves to induce individuals to expose themselves to the intensified

competition that accompanies high population densities.[1] Boserup

found that centralized political communities had repeatedly failed

to induce groups practicing swidden agriculture and other extensive

modes of agriculture to abandon these methods and engage in intensive

plow agriculture. While intensive agriculture was more productive,

it required such high amounts of labor and capital (because of poor

land?) that it was actually less efficient.

In summary, it seems apparent that warfare is an important cause

of nucleation and higher population densities and is a major indirect

cause of economic and social conditions that generate intensified

competition. This is especially true of warfare waged for political

reasons.

Ecological Conditions

The overall ecology of a political community -- its climate,

fauna, flora, soils, waters, and topography -- and the relationship

of humans to this ecology also affects the nature of competition

within political communities. This ecology defines the exploitable

resources that exist and can be used by individuals for survival and

reproduction. Although the scarcity of some resources -- such as

mates -- is a condition common to all societies, the nature of

competition that exists always depends to some extent on what

resources exist, the amounts that exist, and how these are trans-

formed. Some resources that are important to survival and

---

[1] The large influx into the cities that is occurring in Third
World countries seems to contradict this notion. In such societies,
however, the most intense competition may actually exist in rural
areas because of overpopulation and land shortages.

reproduction will be in shorter supply than others, and competition for these should be more intense.

For example, economic competition in agrarian societies occurs over arable land and typically involves kinship groups in disputes over encroachment, inheritance, and land titles. Economic competition in industrialized societies occurs for capital, labor skills, and markets and typically involves businesses engaged in financial transactions, research and development, and advertising.

Population Growth.

Also important to competition in political communities is population growth and the strain that this puts on the exploitable resources. The biologist Thomas Malthus pointed out the tendency in nature for populations to grow faster than can be sustained by the environment. The inevitable result is intensified competition for resources and eventually the deaths of the weakest (typically the youngest and the oldest) because of diseases, food shortages, parasites, and other causes.

The same thing is presumably true for the populations of political communities. These also will grow faster than their resources can ultimately sustain. The inevitable result is intensified competition, unless the political communities can acquire additional resources externally, as in warfare, or find new ways through technological innovation of exploiting existing resources. For most of cultural history technological innovation was too slow to keep pace with growing populations, and political communities fissioned.

Scarcity of resources due to population growth is a particularly potent cause of competition in modern societies. The technology of such societies enables them to more thoroughly exploit the environment. This results in rates of population growth that are not sustainable (Harris, 1977). As resources are depleted, competition for remaining resources intensifies. An example is the political battle over water rights in the southwestern United States. The growth of population in that region and the extension of irrigation farming to formerly arid lands has increased the demand for water so much that major water sources, such as the Colorado river, are no longer sufficient to meet the total demand.

Characteristics of Social Groups.

The nature of competition in political communities is also affected by the characteristics of social life within them. In this regard, small political communities are fundamentally different than large ones. Small political communities have fewer members. There is less diversity among members. Substantial differences in personal attributes or circumstances are less likely to exist or be translated into asymmetries of economic, social, and political power.

Another characteristic of small political communities is the higher degree of genetic relatedness between members. An individual's most reliable allies -- his relatives -- comprise a large proportion of the social group. They are more effective than are the kin of large political communities in resisting economic, social, and political exploitation.

Another characteristic of small political communities is the

permanent nature of many economic, social, and political relation-
ships. Social interactions are more dependable than in large
political communities because they recur more often and are more
likely to be a basis of continuing reciprocity. It is more difficult
for individuals to gain in social interactions at the expense of
others by cheating and deception.

Another characteristic of small political communities is the
lesser number and complexity of their non-kinship groups. Asymme-
tries of power are more often based on kinship than upon the outcome
of struggles between groups with specific economic, social, and
political interests. The existence of groups with specific interests
facilitates the use of other individuals as resources and as a (par-
tial) substitute for resources obtained directly from the environment.

Consequences of Competition

The major consequences of competition within political communi-
ties include the extension of political sovereignty, the growth of
kinship based coalitions, the appearance of social stratification,
intensified competition for political offices, and fissioning.
These are all associated with changes in the structure of political
communities. The extension of political sovereignty results in the
establishment of new political offices that engage in additional
activities, a process that is often referred to as institutionaliza-
tion. The growth of kinship based coalitions shifts competition
within political communities to the group level. Social stratifica-
tion diminishes the foothold of kinship groups in politics. Intensi-
fied competition for offices often leads to fissioning.

Extension of Sovereignty.

An important reason for the extension of sovereignty into non-
military activities, as I argued in Chapter 6, was their linkage to
military activities. I argued that judicial/arbitration activities and
the collection of taxes, tribute, and labor services were several non-
military activities with fairly close linkages. Judicial/arbitration
activities facilitate the resolution of disputes between individuals,
kin groups, and other groups. Such disputes can threaten the
unity of the political community. An example is the autonomous village
that fissions because of a feud between separate lineages. The collec-
tion of taxes, tribute, and labor services is important to the provision-
ing, recruitment, and training of military units.

Another reason for the extension of sovereignty into non-military
activities, however, is intensified competition by individuals, kin
groups, and other groups for resources. This increases the costs to
individuals of living within political communities. It may be in the
interest of political officials to take action to ameliorate these costs
since if they become too large they might threaten the unity of the
political community and the privileged position of the officials within
it. In order to take such action, however, officials first need to
acquire sovereignty in relevant political activities.

As suggested above, intensified competition for resources is a
consequence of higher population densities, and especially, of
urbanization. For this reason the extension of sovereignty into non-
military activities should be linked to increases in population densi-
ties, and particularly, to urbanization.

To test this hypothesis I will look at the relationship that exists between both population density and urbanization on the one hand and the incidence of sovereignty in various kinds of non-military activities on the other. I expect that the direction of all of these relationships will be positive. The magnitude of these relationships, however, will probably vary, reflecting the relative importance of different political activities to ameliorating costs associated with higher population densities and urbanization.

Table 7.3 shows the values of phi obtained by cross-tabulating population density and urbanization, respectively, with different political activities. I estimated population densities of the sample societies by dividing population by territorial area (estimated by tracing maps supplied by ethnographers and using grid lines). To analyze population density I divided societies into three groups: low density (0-3 persons/square kilometer), moderate density (3-15 persons/square kilometer), and high population density (15 and higher). To analyze urbanization I used the same measure as in the previous table.

Table 7.3 shows that the values of phi for the relationship between population density and various non-military activities were generally large and statistically significant (with the exception of the collection of taxes, tribute, and labor services, which was not significant). Values of phi for the relationships involving urbanization, however, were not uniformly large. The values of phi for judicial/arbitration activities and the collection of taxes, tribute, and labor services were quite small.

A look at the tables showed why. The overall incidence of sovereignty in these activities was quite high, even in societies with

Table 7.3: Population Density, Urbanization, and the
Extension of Sovereignty

Activity:	Population Density	Urbanization
the collection of taxes, tribute, and labor services	ϕ= .33 N= 28	ϕ= .02 N= 27
judicial/arbitration activities	ϕ= .44 ** N= 39	ϕ= .11 N= 36
police activities	ϕ= .51 *** N= 37	ϕ= .63 *** N= 35
rule making:		
laws	ϕ= .56 *** N= 36	ϕ= .61 *** N= 34
penal code	ϕ= .49 ** N= 36	ϕ= .51 *** N= 33

*** p < .01   ** p < .05   * p < .10

low urbanization. This suggests that the extension of sovereignty in these activities is a consequence in the first instance of higher population densities and not urbanization. The close linkage of these activities to defense is a likely explanation.

The values of phi for the relationships between urbanization and sovereignty in police activities, laws, and a penal code, however, were large. These activities are directly linked with problems of maintaining social order. Presumably, political officials find it intolerable when people in cities resort to feud or retaliation to settle disputes. In cities, unlike other areas, there is greater potential for widespread social disruption such as occurs with arson, looting, and riot.

Table 7.3 suggests that the extension of sovereignty in judicial/ arbitration activities is not in general accompanied by a similar extension in police activities or in rule making/legislative activities. In small political communities, officials are able to resolve disputes peaceably without the help of police and formal laws; in large political political communities with populous urban areas this is difficult or impossible.

In summary, it would seem that defensive problems result in the first instance in nucleation, higher population densities, and intensified competition. The initial response of political officials is to extend their sovereignty into judicial/arbitration activities (if this sovereignty does not exist already) to prevent the social disruption caused by disputes. In small political communities the direct involvement of officials is often sufficient to settle the most serious disputes or those that are not resolved directly by

the parties. In large political communities, however, this is virtually impossible. There are too many disputes, making it impossible for officials involved in other activities to divert their time and resources to more than a fraction of them. The potential for widespread social disruption encourages officials to establish institutional mechanisms for the resolution of disputes such as courts, laws, penal codes, and police.

Growth of Kinship Based Coalitions

Another important consequence of intensified competition within political communities is growth in the size and complexity of kinship groups. This growth is accompanied by increased involvement of kinship groups in politics, especially over the important question of control of political offices and perquisites. The struggle by kinship groups to acquire and retain political offices has important effects on the structure of political communities.

There is substantial controversy in anthropology about the origins and functions of different types of kinship groups. This greatly complicates any analysis of the involvement of kinship groups in politics. It is difficult to know how and why particular types of kinship groups rather than other types or other groups appeared and became involved in politics.

It may be useful, therefore, to look at arguments about the origins and functions of different types of kinship groups. Some of these arguments may be more plausible than others, especially if they are able to explain the conditions that engender different types of kinship groups. This may help us to understand why

kinship groups, until the modern period, grew in size and complexity
and why they also became involved in politics.

Types of Kinship Groups. The different types of kinship
groups that exist have been studied in great detail by anthropolo-
gists. Murdock (1949) provides an excellent overview of the subject
based upon his study of kinship groups in a worldwide sample of
societies. I will summarize his presentation below, which is a use-
ful framework for analyzing the origins and functions of different
types of kinship groups. This should contribute to a better under-
standing of the relevance of kinship groups to politics.

The most basic way of classifying kinship groups is the division
between residential and consanguineal kinship groups. In residen-
tial kinship groups, members live in close proximity in the same
residential site. A distinguishing feature is their membership.
They always unite both relatives by blood (consanguineal relatives)
and relatives by marriage (affinal relatives). In consanguineal
kinship groups, on the other hand, members live in different residen-
tial sites. A distinguishing feature is that they include relatives
by blood but exclude relatives by marriage.

Residential kinship groups include families of different types.
The most simple type is the nuclear family which consists of a
married man and woman and their children. The nuclear family, unlike
other types of family, exists in every human society.

In most societies nuclear families are aggregated into larger
"composite" families on the basis of affiliations of various types.
The polygamous family is comprised of nuclear families that are
affiliated by plural marriages. There are two types of polygamous

families. In a polygynous family, a common type, a single husband is married to a number of wives. In a polyandrous family, a rare type, a single wife is married to a number of husbands.

The extended family is comprised of nuclear families that are affiliated by parent-child ties. There are four types of extended families: the patrilocal, matrilocal, bilocal, and avunculocal. In the patrilocal extended family the bases of affiliation are the ties between a man, his sons, and his sons's sons. In the matrilocal extended family the ties are between a woman, her daughters, and her daughters' daughters. In the bilocal extended family the ties are between a nuclear family and some but not all of the sons and their children, and some but not all of the daughters and their children. In the avunculocal extended family the ties are between a woman's sons and her brother(s).

Residential kinship groups unite both relatives by blood and by marriage. This is due to the direct role of families in sexual reproduction. The evolutionary advantage of sexual reproduction over other modes of reproduction lies in diversifying genotypes. This advantage would be difficult to realize if sexual relations occurred between closely related individuals. Generally, of course, this does not happen. Natural selection in human evolutionary history has favored outbreeding and the widespread abhorrence by humans of sexual relations between individuals of close blood relationship. The cultural expression of this abhorrence is the incest taboo. The extension of this taboo to relatives of lesser blood relationship has resulted in rules of exogamy or the prohibition of marriage with particular relatives. For this reason, families necessarily

include relatives by blood (e.g., parent and child) and relatives by marriage only (e.g., husband and wife).

Consanguineal kinship groups unite individuals who are relatives by blood. There are a number of ways of doing this, depending upon the rule of descent that is used. With patrilineal descent a child belongs to the kinship group of the father but not of the mother. With matrilineal descent a child belongs to the kinship group of the mother but not of the father. With bilateral descent a child belongs to a kinship group comprised of some of the members of both the father's and the mother's kinship groups. In some societies patrilineal and matrilineal descent are combined so that a child belongs to the kinship groups of both the mother and the father. This is double descent.

Anthropologists have invented a variety of terms to describe consanguineal kinship groups with particular characteristics. The "lineage" is a consanguineal kinship group in which individuals can actually trace genealogical relationships in the prevailing line of descent. In a patrilineage, relationships are traced through the male line. In a matrilineage, they are traced through the female line.

The "sib" is a consanguineal kinship group in which individuals acknowledge descent from a common ancestor but cannot trace actual genealogical relationships. The "phraty" is comprised of two or more related sibs. The "moiety" is a sib or phraty in a society in which there are only two sibs or phraties.

The "kindred" is a consanguineal kinship group in which there is bilateral descent. An example is the group that Americans know as

relatives or kinfolk.

The "section" or "bilinear kin group" is a consanguineal kin-ship group in a society with double descent and moieties. Sections include individuals who are related to one another by both patri-lineal and matrilineal ties, such as siblings and parallel cousins.

Consanguineal kinship groups, because of rules of exogamy, in-clude persons of the other sex who are related but live apart from each other. For example, a brother and sister will belong to the same patrilineage but live in different villages. To some extent, depending on residency patterns, they may also include persons of the same sex who are related and live in the same residential site. For example, with patrilocal residency sons tend to live in the same residential site as their father and brothers. These ties between consanguineal relatives of the same sex based largely upon common residence result in a special type of compromise kinship group that Murdock calls the "clan." The clan includes consanguineal relatives of the same sex and their spouses but excludes consan-guineal relatives of the other sex.

Origins of Kinship Groups. Views about the origins of kinship groups have changed substantially because of theoretical developments in the field of evolutionary biology. To understand the original function of kinship groups it is useful to take a comparative perspective and look at the types of conditions that are associated with "kin selection" in non-human species. One condition seems to be the existence of prey that are hunted most efficiently in groups. Species that are group hunters include lions, wild dogs, dolphins, killer whales, and wolves. Another

and more common condition seems to be the existence of a concentrated resource such as a nest or food supply that is worth defending. Species that guard nests include ants, bees, wasps, and termites. It would seem that either or both of these conditions might have been relevant to the origin of kinship groups.

(1) The Hunting Hypothesis. The view that is most popular among anthropologists -- the hunting hypothesis -- focuses on the first condition. The most important force in the evolutionary line leading to humans was the existence of large prey that could be hunted most efficiently in groups. The structuring of groups based upon ties of kinship would be advantageous because genetic relatedness between the members of such groups would facilitate the evolution of cooperation that would promote successful hunting and sharing in the division of killed prey. This cooperation is evident in many hunting species. Field studies indicate that the members of such groups are closely related.

The hunting hypothesis seems sufficient to explain the evolution of small kinship groups such as nuclear and extended families. It is thought that ecological conditions like those that exist on the African savanna, the place of the origin of the evolutionary line leading to humans, would have favored the appearance of a species that lived in small groups, hunted in the daytime, used weapons, employed cooperative hunting methods, shared killed prey, and moved from place to place (Leakey and Lewin, 1977). It is likely that small family size groups would have been most efficient in hunting large migratory prey species such as the wildebeeste.

The purpose of the hunting hypothesis, however, is to explain the evolution of hunter-gatherer groups that are larger than nuclear and extended families and that were the basis of human social organization, so far as is known, for 99 percent of cultural history. Anthropologists believe that the characteristics of some historically observed hunter-gatherer societies resemble quite closely those of primitive ones. These characteristics were summarized by Julian Steward (1955) who used the label "patrilineal band" to describe a human social group characteristic of societies with low population densities, dependence upon hunting, simple methods of transport, and the extension of the incest taboo to coresident members of the extended family.

Studies of group hunting species such as lions (Schaller, 1972), wild dogs (van Lawick and van Lawick, 1971), and wolves (Mech, 1970) have found that group sizes are not especially large and are generally much smaller than the 25 to 75 size range believed to be characteristic of early human groups. The hunting hypothesis, therefore, seems unable to explain hunter-gatherer groups because it cannot explain why the size of these groups was so large in relation to other group hunters (Alexander, 1979).

(2) The Predation Hypothesis. An alternative argument is that the evolution of hunter-gatherer groups of larger size than nuclear and extended families depended on the existence of large and dangerous predators and scavengers such as leopards and lions (Alexander, 1979; Alexander & Noonan, 1979). The large size of hunter-gatherer groups is explained by the advantages of cover and protection that large groups afford from attacks by predators and

scavengers. The appearance some time later of armed and hostile groups of conspecifics would reinforce these original advantages.

The advantages of cover and protection, unlike those of cooperative group hunting, always increase as group sizes become larger. Thus, they could explain why primitive human groups ranged in size from 25 to 75 rather than being much smaller. They could also explain why human groups could grow even larger until today some large states like China have hundreds of millions of people (see Alexander, 1979).

The structuring of defensive groups based upon ties of kinship, as in many ants, bees, and wasps, would be advantageous because genetic relatedness between members would facilitate the evolution of cooperation. Such cooperation would promote the use of effective military practices in the defense of important reproductive resources such as land used in hunting, domesticated animals, and women. In this regard, humans were similar in some degree to other species in which members are closely related and in which some members of the group cooperate to protect an important, defensible resource. In other respects, however, humans were quite different. Group sizes were smaller, and resources were less concentrated and more difficult to defend.

According to the predation hypothesis, therefore, the patrilineal band appeared because it was an effective way for individuals to obtain protection from large and dangerous predators and scavengers and later, groups of hostile conspecifics. The patrilineal band, because of its size, provided cover, especially for its younger and weaker members. It also promoted cooperation in defensive effort because of the genetic relatedness between its male members.

The existence of large and dangerous predators and scavengers and especially groups of hostile conspecifics, therefore, is one possible explanation for the emergence of large kinship groups with localized memberships. Examples of such kinship groups include patrilineages and clans.

Functions of Kinship Groups. The functions of small kinship groups are often transparent from the activities in which they engage. This is certainly true of the nuclear family. As a defensive unit, it guards children from dangerous animals and people. As an economic unit, it cooperates in securing resources, providing shelter, obtaining food, and transporting belongings. As a social unit, it cooperates in sexual reproduction and the care, nurture, and instruction of children. All of these activities have direct effects upon the inclusive fitnesses of individuals.

The functions of large kinship groups, however, are not always so transparent. Anthropologists have tended to focus more upon kinship terminology than upon the significance of kinship groups in terms of how their members actually interact with each other and with others within the political community.

In spite of this, many anthropologists would agree that large kinship groups commonly do one or more of the following things: (1) act as a basis of solidarity to provide protection from hostile groups of humans, (2) act as a unit for the purpose of garnering, holding, and distributing resources, (3) act as a basis of solidarity in situations of social conflict within political communities (or as a second line of defense), (4) define the group into which an individual can and cannot marry, and (5)

act as a basis of political office holding. It would appear, there-

fore, that large kinship groups have a multiplicity of functions.

It suggests the possibility that the involvement of large kinship

groups in politics is an incidental consequence of their original

involvement in other activities. Initially, they acted as a defen-

sive unit. As political communities became more populous, and

competition within them more intense, they acted as an economic

unit and as a basis of alliance in social conflict. Whatever the

sequence of kinship group activities, their involvement in these

activities has had significant effects upon the nature of competi-

tion both between and within political communities.

(1) Kinship Groups and Protection from Hostile Groups.

The predation hypothesis suggests that the origins of kinship groups

larger than nuclear and extended families is linked to the advanta-

ges of protection from groups of hostile conspecifics. Since there

is little reason to think that this function became any less impor-

tant over time, at least in small political communities, the preda-

tion hypothesis is presumably relevant to explanations of the kin-

ship groups that existed in many historically observed hunter-

gatherer and tribal societies. These were of two basic types:

patri-kin groups and matri-kin groups. In the former, descent is

in the male line. In the latter, it is in the female line. An

explanation of these kinship groups that was consistent with the

predation hypothesis would provide additional support to the notion

that defensive problems have had a widespread impact on political

communities.

Patri-Kin Groups: As I argued above, the origin of kinship

groups in which descent is reckoned along male lines is a likely

consequence of the advantage of cooperation between related males

in defensive effort directed against groups of hostile conspecifics.

According to most anthropologists, patri-kin groups were far more

common than matri-kin groups in the hunter-gatherer groups that

were the predominant mode of social organization for almost all of

human cultural history.

A cross-cultural study by Otterbein (1968b) showed that

the frequency of internal war, which is generally small scale, was

higher in societies with fraternal interest groups (i.e., large

kinship groups in which descent is in the male line). The predation

hypothesis suggests, however, that the direction of causality is

actually the reverse of Otterbein's hypothesis. That is, conditions

that result in a high frequency of internal warfare or more gener-

ally warfare on a small scale promote the development of large

kinship groups in which descent is in the male line.

To test this hypothesis I looked at the relationship between the

frequency of war (both internal and external) and patterns of resi-

dency. I used three codes for patterns of residency: related males

tend to live in close proximity to each other, related males live

in close proximity to some extent, and related males do not live in

close proximity. Anthropologists often use the terms patrilocal

and matrilocal to describe the first and third residency patterns,

respectively. I selected the pattern of residency as the dependent

variable rather than the type of kinship group because warfare should

first affect residency. Patterns of residency, in turn, should

determine the types of kinship groups that exist (Murdock, 1949).

Table 7.4 shows the relationship between the frequency of internal war and patterns of residency. Since my hypothesis pertains only to warfare that is small scale, the table includes only societies with uncentralized political communities. Although there were very few societies for analysis, the relationship was in the expected direction and was statistically significant. Table 7.5 shows the relationship between the frequency of external war and patterns of residency in uncentralized political communities. Once again, although there were very few societies for analysis, the relationship was in the expected direction.

The next step was to determine whether patterns of residency were correlated with types of kinship groups. My measure of types of kinship groups was drawn directly from codings in the Ethnographic Atlas pertaining to "largest kinship group." I developed four codes similar to those used above: patrilineal kin groups present, matrilineal kin groups, bilateral kin groups, and no large kin groups. One society with both patrilineal and matrilineal kin groups was coded as patrilineal kin groups present. Two other societies with both patrilineal and bilateral kin groups were coded in the same way.

Table 7.6 shows the relationship between patterns of residency and types of kinship groups. My hypothesis was that a residency pattern in which related males lived in close proximity would be associated with patrilineal kin groups. As the table shows, the relationship was in the expected direction.

These results suggest that when warfare is on a small scale it is a likely cause of cooperation between related males and common

Table 7.4: Frequency of Internal War and Residency Patterns
(uncentralized political communities only)

Frequency of Internal War	Residency Patterns (Related males live in close proximity?)		
	No	To Some Extent	Yes
Infrequent (attacks may not occur for years)	1	1	0
Frequent (once a year or less)	0	3	2
Continuous (more than once a year)	0	3	7
	N= 17	phi= .54 p < .05	

Table 7.5: Frequency of External War and Residency Patterns
(uncentralized political communities only)

Frequency of External War	Residency Patterns) (Related males live in close proximity?)		
	No	To Some Extent	Yes
Infrequent (attacks may not occui for years)	0	4	0
Frequent (once a year or less)	0	2	0
Continuous (more than once a year)	1	2	6
	N= 15	phi= .54 p < .10	

Table 7.6:   Patterns of Residency and Large Kin Groups

Large Kinship Groups

Patterns of Residency (Related males live in close proximity?)	None	Bilateral Kin Groups	Matrilineal Kin Groups	Patrilineal Kin Groups
No	2	1	3	0
To Some Extent	4	2	7	8
Yes	3	0	0	20

N= 50   phi= .47
                 p < .01

residency. Such cooperation and common residency can result in the emergence of large kinship groups in which descent is reckoned in the male line.

Matri-Kin Groups: The somewhat low incidence of large kinship groups in which descent is in the female rather than in the male line is a significant challenge to evolutionary theory. For many years anthropologists assumed that the cause of matri-kin groups such as matrilineages was the disproportionate contribution of women to subsistence. A commonly cited example was the horticultural society in which women are gardeners. It would make sense in such a society for inheritance in land, tools, and houses to be transmitted in the female rather than in the male line because these resources were held and used by women, not men.

A number of studies, however, have challenged this view. A study by Divale (1974) argued that matrilocal (or uxorilocal) residence was an adaptive response to the disequilibrium that occurred when a patrilocal (or virilocal) society migrated into an already inhabited region. Migration results in external warfare between the migrating society and indigenous societies. In order for the migrating society to be successful in warfare, its political communities must stop fighting among themselves and cooperate against the indigenous societies. The adoption of matrilocal residency accomplishes this because it results in the dispersal of related males from their natal villages and the break up of fraternal interest groups.

Studies by Ember and Ember (1971) and by Ember (1974) argued that the cause of matrilocal residency was somewhat different than that hypothesized by Divale. In societies in which internal war exists,

families will keep their sons at home for protection. In societies that engage in purely external war, on the other hand, the need to keep sons at home for protection is no longer so important. In this situation the "relative contribution of each sex to subsistence might determine familial preference for which sex should stay at home after marriage -- hence under conditions of purely external warfare, division of labor might determine residence." (1974:136)

Ember (1974) used data from the Divale sample to show that there was little or no relationship between migration and matrilocal residency controlling for the type of warfare that existed. This suggested that the relationship between migration and matrilocality that Divale found was possibly spurious. A further analysis of Divale's data showed that among migrating societies societal size was strongly related to matrilocality. She argued "that the pool of small and successful societies is much larger among migrating societies than among non-migrating societies, and hence that the possibility of matrilocality is much greater among migrating societies." (1974:147)

It would seem that Ember's hypothesis, in which warfare is causally antecedent to residency, has greater plausibility than does Divale's. However, her argument could be improved somewhat by closer consideration of the possible effects of external war on residency.

I would argue that insufficient attention has been paid to a fundamental difference between internal and external war. More often than internal war, external war is waged with distant political communities. It requires lengthy military campaigns. For this reason, husbands are absent from their families for long periods of time. It would seem that with their husbands absent, wives would be inclined to

leave their husband's household and return to their natal household where they would receive the economic, psychological, and social support of their own "blood" relatives.

In a society that engaged in external war continuously or frequently, the mode of subsistence might change to accomodate the lengthy absences of husbands from the household. This might explain why under conditions of purely external warfare division of labor determines residence (Ember, 1974).

An incidental effect of external war and matrilocal residency would be a decline in certainty of paternity and an increased reluctance by husbands to invest in their own children as opposed to sister's children or other relatives who are putatively more close (Alexander, 1979). In a situation like this, the economic role of the matri-kin group would be further enhanced.

These hypotheses are not especially easy to test. What is really needed is a measure of how often the men of a political community are absent from their villages. Although external war is a common enough reason for this in many societies, it is not the only reason. For example, in some societies the men of a political community may also go away on long expeditions to hunt, to fish, or to trade. Also, while external war is typically associated with long military campaigns, this is not always the case.

In looking at the effect of the type of warfare (internal warfare, purely external warfare) on residency, I found no relationship (phi= .02, p > .10). This was rather puzzling to me. I conducted a more detailed analysis of societies with matrilineages and

did not find anything very striking about these societies except that all of them engaged in external war. Thus, it is possible that external war is a necessary condition of matrilocal residency but is not a sufficient condition.

Much probably depends upon the nature of external war. I do have one measure that gives some indication of the type of external war that existed in a society. This is a measure of how the society came to occupy its territory. I used four codes: indigenous, expanded into the area as a result of warfare, migrated into the area, and driven into the area. Two of these ways of occupying territory would either not involve external war (indigenous) or would be external war at close range (expanded into the area as a result of warfare).

The other two ways of occupying territory would seem to involve greater social disruption. In cases of reported migration the society is often being pushed by others. An example in North America was the Kiowa, a tribe that "migrated" from north to south due to the military pressure of other tribes. In other cases the society was clearly driven into its territory.

Military pressure of this type puts enormous strains on the defensive capabilities of political communities and results, simultaneously, in strains upon kinship groups. Among the Kiowa, for example, warriors would leave for a year or longer on military campaigns. The kinship groups among the Kiowa exhibited bilateral extension (i.e., kindreds) and were unusually small in relation to those typically found in tribal societies.

Table 7.7 shows the relationship that existed in the sample societies between the mode of occupation and residency. It shows that the

Table 7.7:   Mode of Occupation and Residency Patterns

Mode of Occupation	Residency Patterns (Related males live in close proximity?)		
	No	To Some Extent	Yes
Indigenous, Expansion as a Result of Warfare	1	3	8
Migration, Driven into the Area	2	10	4

N= 28   phi= .42
               p < .10

dispersion of related males was a condition that was more likely to exist in societies which had migrated into or were driven into the territories they occupied.

Social disruption that results in the dispersion of related males is likely to lead to an increase in the frequency of adultery, lowering certainty of paternity. If men are away on military campaigns, nobody may be at home to watch the activities of the wives. This would be especially true if wives returned to their natal households during campaigns or lived permanently in their natal households. There is no reason why a wife's relatives would be intensely concerned about who fathered her children if he had no role in caring for or assisting the children.

Table 7.8 shows the relationship between residency and cuckoldry. My measure of cuckoldry is indirect -- the fragility of marriages. My assumption is that the fragility of marriages in a society is positively correlated with the frequency of adultery. The table shows that marriages were indeed more fragile in societies in which there was a dispersion of related males. It would seem that some types of external war result in men leaving on long military campaigns. This affects patterns of residency, resulting in an increase in adultery and increased fragility of marriages. The reluctance of men to invest in their "own" children would presumably reinforce changes in the direction of matrilocal residency.

(2) Kinship Groups as a Resource Holding Unit. Large kinship groups with localized memberships sometimes hold important resources such as land and transmit these from generation to generation as inheritance. The control of an important resource within

Table 7.8: Residency Patterns and the Fragility of
Marriages (Cuckoldry)

Fragility of Marriages

Residency Patterns (Related males live in close proximity?)	Marriages Not Fragile (adultery uncommon)	Marriages Fragile (adultery common)
No	1	5
To Some Extent	4	13
Yes	11	7

N= 41   phi= .40
p < .05

a lineal descent group is a more effective way than individual owner-
ship of preventing its alienation and loss. If individuals owned land
they might be tempted to barter or sell portions or all of it in
hard times. They might transmit it to a relative by marriage if they
lack an heir. They might also lack sufficient resources to prevent the
encroachment of other powerful individuals and kinship groups on their
land. In my sample I was able to identify 15 societies in which
political officials as the heads of large kinship groups had the
authority to distribute land among members.

The actions of large kinship groups as resource holding units
are paralleled in many other species, such as many ants, bees, wasps,
and termites, in which generational overlap exists and there is an
important resource such as a nest worth defending. Many of these
species, however, have achieved a higher level of sociality than
humans in the sense that sterile castes with specialized functions
exist. Presumably, defendable resources such as nests were more criti-
cal in the evolutionary history of these "eusocial" insects than were
defendable resources in human evolutionary history. Otherwise, we
might expect humans to also be eusocial.

(3) Kinship Groups As a Second Line of Defense. In
most societies, for small conflicts outside the family, individuals
can deal successfully with things on their own. If the individual
is insulted he can demand an apology. If something of his is stolen
he can demand that it be returned. For serious conflicts outside the
family, however, individuals may lack the resources to deal success-
fully with things on their own. They need help from others.

The first source of allies, of course, is the immediate family. A young child who is injured by a playmate will turn to its mother. A wife who insulted by a neighbor will turn to her husband. A man who is assaulted will ask the help of his brother.

In simple political communities, that often lack police, the second source of allies is typically the large kinship group. Although individuals may seldom require their assistance, the existence of large kinship groups is an additional layer of protection, especially in regard to more serious conflicts like those that arise over serious delicts such as attempted murder.

The importance of the family and larger kinship groups in the context of competition within political communities is a widely known fact about human social behavior. The extent to which individuals rely upon family and other kin in times of danger or need, however, is easily underestimated. Reliance upon family and kin should be especially marked in the simple societies that were predominant in my sample. The individuals of many of these societies cannot rely upon police to protect them. Nor can they rely upon a public safety net in times of need.

To gauge the importance of the family and larger kinship groups as allies, I gathered information on the extent to which the parties to disputes sought or typically sought allies and if they sought allies, whom they sought. Of the disputes that I recorded, the overwhelming proportion (73 percent) began as disputes between two unrelated individuals. Thus, the alliances that were formed by the parties to disputes typically involved unrelated individuals seeking different sets of allies.

Table 7.9 shows the relative incidence of different alliances that were formed both by the perpetrator of the dispute and by the victim. It shows that blood relatives were sought more often than any other individuals, somewhat less than half the time. The perpetrators of disputes sought blood relatives as allies more than four times as often as they sought any other allies. The victims of disputes also turned quite often to blood relatives. More often than perpetrators, however, they were also able to turn to unrelated individuals.

The results of Table 7.9, although hardly surprising, support the notion that the individual's blood relatives or genetic kin are the most reliable allies in disputes with others. This is consistent with the theory of inclusive fitness of William Hamilton (1964). The reproductive success of an individual depends not only upon his own success in securing resources and raising children but also on the success of his relatives, to the extent that the individual's assistance increases this success and to the extent that these relatives share genes that are identical by descent. Since disputes involve conflicts over important reproductive resources, an individual helps himself (reproductively) by coming to the assistance of relatives in disputes. Presumably, the conditions of intensified competition within political communities were a major cause of the emergence of complex alliances based upon ties of kinship that could act as a second line of defense (see Alexander and Noonan, 1979).

(4) Kinship Groups and Marriage. An important function of many consanguineal kinship groups is to identify a group into which an individual cannot marry. Since this group generally includes individuals who are genealogically related, the involvement of

Table 7.9: Initial Parties to Disputes and the
Allies that They Sought

	Percent	Number
Alliances that were formed (if any) by the perpetrator:		
blood relatives	45	
relatives by marriages	2	
friends	2	
powerful unrelated individuals (who also may be friends)	4	
kin groups, other than perpetrator's	0	
non-kin groups, villagers (who may be friends, kin)	10	
no alliances were formed (are typically formed)	36	
other	1	
	100	(239)
Alliances that were formed (if any) by the victim:		
blood relatives	46	
relatives by marriages	4	
friends	5	
powerful unrelated individuals (who also may be friends)	7	
kin groups, other than victim's	0	
non-kin groups, villagers (who may be friends, kin)	17	
no alliances were formed (are typically formed)	16	
other	5	
	100	(261)

consanguineal kinship groups in arranging marriages promotes exogamy and outbreeding.

Mates are among the most important of reproductive resources. It is not surprising, therefore, to find that kinship groups are deeply involved in arranging and regulating marriages. In some simple political communities, especially those in which polygyny is wide-spread like the Yanomamö studied by Napoleon Chagnon (1979b), marriageable women are very scarce. This can lead to intense political competition between kinship groups as the heads of different groups attempt to manipulate exchanges of women for the benefit of themselves and their male relatives.

Marriages sometimes acquire political significance in the context of alliance building. In simple political communities officials (and warriors) are often very reluctant to attack neighboring political communities in which their daughters, sisters, nephews, nieces, and other relatives live. Those political communities are more likely to be allies than enemies.

In complex political communities officials sometimes try to arrange marriages with the children of officials of other political communities as a way of building new alliances or cementing old ones. In doing this, they solidify the position of their own kinship group in political office by making the defeat of their political community in warfare less likely.

(5) Kinship Groups and Politics. It seems likely that the involvement of kinship groups in politics is largely a consequence of increasing group sizes and intensified competition for resources.

The kinship group became a basis of solidarity in competition with other kinship groups for control of the political structure and its perquisites.

Analysis of the involvement of kinship groups in politics, however, is greatly complicated by a lack of conceptual precision in the anthropological literature. For example, British anthropologists often use the term sib to describe a clan. To avoid confusion of this sort I decided to ignore fine distinctions and instead focus upon the prevailing rules of descent and the types of kinship groups that resulted from these rules. This results in a five fold classification: patri-kin groups, matri-kin groups, both patri-kin and matri-kin groups, bilateral kin groups, and families (and extended families).

Ties of kinship are especially important to individuals in societies that have not experienced substantial modern contact and thus have not been subject to disruptive economic, social, and political forces. Since most of the societies in my sample were studied before these forces had taken effect, I expected that the involvement of kinship groups in politics in the sample societies would be very high.

To gauge this involvement, I determined the importance of ties of kinship to appointment or selection to political offices. I used three codes: dominant, competitive, and insignificant. In the dominant situation, all or nearly all of the higher political positions within political communities were filled from a single kinship group. In the competitive situation, higher political positions were not filled from a single kinship group and kinship groups typically competed for these positions. In the insignificant

situation, higher political positions were filled on some basis other than kinship group membership.

The classification of societies was difficult because of varying numbers of political communities within the sample societies. The political power of single kinship groups in societies with multiple political communities sometimes extends beyond the boundaries of a single political community. For this reason I differentiate between societies with only a single political community and those with multiple ones.

Table 7.10 presents the results of this classification. Looking first at the importance of ties of kinship to appointment or selection to political office, the table shows that the dominant situation existed in 25 societies, the competitive situation in 20 and the insignificant situation in 13. In a plurality of societies, therefore, a single kinship group dominanted the highest political offices.

Looking next at the types of kinship groups, it is clear that patri-kin groups were most common (30 societies) and outnumbered matri-kin groups (10 societies) three to one. There were only three societies with both patri-kin and matri-kin groups. Four societies had bilateral kin groups. The eleven remaining societies had other types of kin groups (mostly families and extended families). These results suggest a number of hypotheses about kinship groups, their involvement in politics, and the effects of this involvement on the structure of political communities.

Size: It seems likely, consistent with the discussion above, that the origin of large kinship groups is linked with increases

Table 7.10: The Political Significance of Kin Groups

	#	Societies
Patri-Kin Groups Only:		
1. Single Political Community		
single dominant	1	Songhai
competitive	2	Iran, Gujarati
2. Multiple Political Communities		
single dominant within political communities	16	Babwa, Thonga, Nama, Gogo, Lugbara, Jur, Madan, Okinawa, Mogh, Purari, Mailu, Koita, Wukchumni, Tachi, Winnebago, Tehuelche(?)
competitive within political communities	4	Guro, Banyun(?), Sara(?) Kapauku
insignificant	7	Dorobo, Konso, Bungi, Northern Saulteaux, Botocudo, Pima, Baiga
Matri-Kin Groups Only:		
1. Single Political Community		
single dominant	1	Kuba
insignificant	1	Zuni
2. Multiple Political Communities		
single dominant within political communities	2	Bunda, Garo
competitive within political communities	4	Luvale, Luguru, Ahaggaren, Goajiro
insignificant	2	Wichita(?), Jemez

Table 7.10: The Political Significance of Kin Groups
(continued)

<u>Both Patri-Kin and Matri-Kin Groups</u>:

2. Multiple Political Communities

patri-kin and matri-kin competitive	1	Dinka
patri-kin competitive, matri-kin insignificant	1	Aua
patri-kin and matri-kin insignificant	1	Iraqw

<u>Bilateral Kin Groups</u>:

1. Single Political Community

single dominant	1	Azcecs
competitive	1	Siamese

2. Multiple Political Communities

competitive	2	Tonga(?), Kiowa

<u>Other</u>:

1. Single Political Community

single dominant family	1	Inca
competitive families	2	Cebu, Tewa(?)

2. Multiple Political Communities

dominant families	3	Manihikians, Falasha, Atsugewi
competitive families	4	Sivokakmeit, San Juan, Chichimeca, Bohogue
insignificant families	1	Selung

(?) classification uncertain

in human population densities and intensified competition for resources, both between and within political communities. In regard to competition between political communities, large kinship groups would be of value as a basis of solidarity in military units and for the formation of alliances (see Otterbein, 1968a).

The incidence of large kinship groups and the involvement of large kinship groups in politics, therefore, should be somewhat less in political communities with only a single territorial level than in those with two or three. The latter typically have higher population densities and more serious defensive problems. The incidence and involvement of large kinship groups should also be somewhat less in political communities with four levels (i.e., states). Ties of kinship would be an increasingly less effective basis of group solidarity as kinship groups grew in size and genealogical relatedness between members declined. Also, large kinship groups would be less effective than other types of large groups, such as the political parties of modern societies, that exist only for political purposes. Warfare would occur on such a large scale and involve such large military units that the formation of military units on the basis of ties of kinship would be difficult or impossible. Ties of kinship would be an inadequate basis of cooperation within military units and would be replaced by chains of command.

To test tnese ideas I examined the relationship between political centralization and the degree of control of political communities by large kinship groups. I expected that large kinship groups would exist and be politically significant more often at intermediate levels of political centralization (two and three levels)

than at either low levels (a single level) or high levels (four levels).

Table 7.11 shows the results of this analysis. Looking first at the incidence of large kinship groups, those societies without them appear in the first column, those with them in the second and third columns. It is apparent that large kinship groups were common in all types of political communities but somewhat less common in those with only one level and those with four levels. Looking next at the degree of control of political communities by large kinship groups, those societies in which these groups were not politically significant appear in the first and second columns, those in which they were appear in the third column. As the table shows, although large kinship groups were politically significant in all types of political communities, this was more often true of those with two or three levels. The distribution of societies within the table, therefore, supports my hypothesis.

I also examined the relationship between population density and the degree of control of political communities by large kinship groups. I expected that large kinship groups would exist and be politically significant most often at moderate population densities, less often at low and high densities. Table 7.12 shows the results of this analysis. This hypothesis would also seem to be supported.

Kinship Groups and Polarity: The major focus of political action by kinship groups is competition for political offices. The reason for this is fairly obvious. Control of political offices results in the acquisition of substantial perquisites (see Chapter 8).

Table 7.11:   Political Centralization and the Political
Significance of Large Kinship Groups

Significance of Large Kinship Groups

Political Centralization	Only Small Kinship Groups	Large Kinship Groups, But Insignificant	Large Kinship Groups, Dominant or Competitive
Zero or One Level	6	5	14
Two Levels	1	4	10
Three Levels	1	0	5
Four Levels	2	2	7

N= 57

Table 7.12:   Population Density and the Political
Significance of Large Kinship Groups

Significance of Large Kinship Groups

Population Densities	Only Small Kinship Groups	Large Kinship Groups, But Insignificant	Large Kinship Groups, Dominant or Competitive
Low (0-3 sq/kil)	5	4	5
Moderate (3+ -15 sq/kil)	1	0	12
High (15+ sq/kil)	2	4	7

N= 40

The control that kinship groups hold over appointment and selection to the highest offices of political communities has important consequences for the degree of polarity (or concentration of sovereignty) that exists. When a single kinship group is dominant within a political community, polarity should be high. When the situation is competitive, or when kinship groups are politically insignificant, polarity should be low.

Table 7.13 shows the relationship between the political significance of kinship groups and polarity. The relationship was in the expected direction and was significant. When a single kinship group was dominant within a political community, polarity was almost always high. The same was not true of other situations. This result supports the notion that the outcome of competition between kinship groups for control of political communities has important consequences for their structure.

An interesting question is whether particular types of kinship groups are better able to acquire dominance within political communities than other types. For example, it would seem that patri-kin groups, since they unite closely related men, would be more effective in acquiring dominance than other types of kinship groups in which relatedness between men is less or in which the size of the kinship group is smaller. A test of this hypothesis in Table 7.14 shows that this was true, but only to a limited extent. Fifty-seven percent of patri-kin groups acquired dominance, versus only 30 percent of other types of kin groups. Thus, patri-kin groups enjoy an advantage in the struggle for political power but not an overwhelmingly large one.

Table 7.13: The Political Significance of Kinship Groups
and Polarity

	Polarity	
Political Significance of Kinship Groups	Low	High
Insignificant	4	2
Competitive	7	7
Dominant	3	14

N= 37   phi= .40
p < .05

Table 7.14:   Type of Kinship Group and the Political Signif-
icance of Kinship Groups

Type of Kinship Group	Political Significance of Kinship Groups		
	Insignificant	Competitive	Dominant
Patri-Kin Groups	7	6	17
Matri-Kin Groups	3	4	4
Patri-Kin & Matri-Kin Groups	0	2	0
Bilateral Kin Groups	1	3	0
Other (Nuclear & Extended Family, Other)	4	6	1

N= 58   phi= .34
p < .10

If patri-kin groups enjoy only a small advantage, their high incidence is presumably due only partly to their superior competitive abilities vis-a-vis other types of kinship groups (note: the data do not allow a direct test of this hypothesis). If this is true, it may reflect that the factors that promote different types of kinship groups are more directly attributable to conditions of external than of internal polity.

It is worthwhile at this point to summarize the major arguments that I presented above about the political involvement of different kinship groups. The origin of large kinship groups of different types, including both patri-kin and matri-kin groups, is probably linked with the existence of defensive problems of different types. Patri-kin groups seem to be solutions to war that is fought at close range, matri-kin groups to war that is fought at long range. Once large kinship groups appeared, they became more deeply involved in politics. As political communities became larger and population densities increased, large kinship groups became important as resource holding units and as a second line of defense, supplementing the role of the family. They became an important unit of competition for resources within political communities, promoting the economic, social, and political interests of their leaders and members. More successful kinship groups succeeded in establishing control of political offices within their political communities. Once in power, they worked to solidify their foothold and secure the perquisites that accompany office-holding for themselves and their descendants.

Social Stratification

The origins and causes of social stratification are controversial issues in the social sciences. Anthropologists have in general paid little attention to the subject since they have tended to study egalitarian societies in which distinctions of wealth, at least in comparison to modern societies, are not large. Murdock (1949) looked at the subject briefly and found that social stratification was positively correlated with a sedentary economy. However, he did not explore the subject any further.

Sociologists, of course, have paid a great deal of attention to social stratification. Most of their research, however, pertains to modern societies and their historical precursors. For this reason their analyses often do not address questions about the origins of social stratification.

A study by Frederick Engels (1891), who was a close friend of Karl Marx, was one of the earliest analyses of the origins and causes of social stratification. His analysis, therefore, is the original Marxist interpretation. He argued that there were at least two causes of social stratification. One was of external origin: the taking of captives in warfare and slavery. Slavery was the original precursor of social stratification. Another cause was of internal origin: changing relations of production and decline in the economic power of kinship groups. As relations of production began to change due to commodity production and money, kinship groups began to lose control of strategic resources. The concept of private property replaced that of community property based on membership in the kinship group.

The data that I collected are useful because they illustrate some modifications of Engels' arguments that I think are necessary. Table 7.15 shows the relationship that existed in the sample societies between reasons for waging war and wealth distinctions. It would seem that slavery should be most common in political communities which wage war to obtain captives. As the table shows, however, there was virtually no relationship in this sample.

This result, I believe, is attributable to two things. First, in a number of societies, captives were taken but were used for purposes other than slavery (e.g., cannibalism, as hostages, sacrifical purposes, as concubines). This would explain why there were political communities which waged war to obtain captives but in which wealth distinctions were absent. Second, in societies that did not wage war to obtain captives but nevertheless had slaves, it would seem that slaves could have been obtained by other means, such as purchase and trade. Slaves might also have been obtained among refugees (possibly of defeated political communities) who lacked the means to support themselves, at least temporarily, because they were without any allies in the political community to which they emigrated.

Table 7.16 shows the relationship that existed in the sample societies between the degree of control by kinship groups over the political structure and wealth distinctions. Engels' argument suggests that social stratification is linked with the loss by kinship groups of political control. The table, however, shows very little relationship, if any, between these variables.

There are a number of points to make about the Marxist argument. First, the absence of kinship group control in political communities is

322

Table 7.15: Warfare for Captives and Wealth Distinctions

Wealth Distinctions

Warfare for Captives	None	Slaves Only	Slaves + Wealth Distinctions	Wealth Distinctions
No	7	7	8	4
Yes	8	2	5	4

N= 45 phi= .24
p > .10

Table 7.16: Political Control by Kinship Groups and Wealth Distinctions

Wealth Distinctions

Political Control by Kinship Group	None	Slaves Only	Slaves + Wealth Distinctions	Wealth Distinctions
None, Insignificant	6	3	2	0
Competitive	7	3	5	5
Dominant	10	4	7	3

N= 55 phi= .21
p > .10

associated both with the most simple political communities (those with
a single territorial level) and the most complex ones (some types of
states, especially modern states). At the time Engels wrote, very little
was known about hunter-gatherers so that he probably assumed that large
kinship groups, like the gens or clan, existed in all simple societies.

Second, the existence of inequality of access to or control over
strategic resources (the means of production) is not an essential condi-
tion for the emergence of wealth distinctions. These already exist in
simple political communities in which inequality of access to or control
over resources is essentially lacking. One cause of wealth distinctions
is the variation in individual skills and temperament. For example,
men who are excellent hunters will obtain a higher standard of living
for their families than men who are not. Another cause is differences
in the size and strength of kinship and other groups. For example,
among the Bungi of North America, members of the okitcita society enjoyed
special privileges (the ability to confiscate materials, the right to
kill anyone who resisted their commands or offended them) because of the
status they acquired from military exploits and their domination of the
tribal council (Skinner, 1916:486,489,495). Thus, power in some politi-
cal communities is itself a basis of inequality because of the perqui-
sites attached to political offices.

Third, kinship group control of political communities has been
somewhat more durable than Engels expected. Monarchy was the predominant
form of government in Western Europe until the First World War. It per-
sists in vestigial form in Great Britain, the Netherlands, Japan,
Norway, and Sweden, and is still rather robust in Spain, Jordan,
and Morocco. In the Third World, many countries are dominated by single

families. North Korea, the Philippines, and Taiwan are examples.
Many other Third World countries, such as those in Central America,
are dominated by intermarrying kinship groups. It is noteworthy that
"new classes" have appeared in socialist countries that are comprised
of officials who belong to the higher levels of the government, par-
ty, and military. The special social and economic privileges that
the members of these classes enjoy are transmitted to their children.

An interesting aspect about social stratification is its positive
correlation with political centralization. A major cause of increas-
ing political centralization -- conquest -- generates slaves, castes,
and classes among the vanquished populations. A major consequence
of increasing centralization -- urbanization -- encourages economic
specialization which leads to differences in wealth. Urbanization
also tends to break up large kinship groups which are no longer so
effective as units for garnering and distributing resources. Without
this second line of defense, the wealth positions of less skillful
and less fortunate nuclear families and individuals declines. Table
7.17 shows the relationship in the sample between political central-
ization and wealth distinctions. The relationship was positive and
in the expected direction.

According to Marxist theory, inequality of access to or control
of resources, especially capital, is associated with control of politi-
cal communities. This hypothesis can be tested with data from the
sample societies. Table 7.18 shows the relationship between wealth
distinctions and polarity. Presumably, Marxist theory would pre-
dict that the absence of wealth distinctions would be associated with
low polarity, the presence with high polarity. The table shows that in

Table 7.17: Political Centralization and Wealth Distinc-
tions
(autonomous political communities only)

Wealth Distinctions

Political Centrali-zation	None	Slaves Only	Slaves + Wealth Distinctions	Wealth Distinctions
Zero or One Level	16	5	3	0
Two Levels	5	3	5	2
Three Levels	0	0	3	2
Four Levels	0	1	3	3

N= 51   phi= .40
                         p < .01

Table 7.18: Wealth Distinctions and Polarity

Polarity

Wealth Distinctions	Low	High
None	6	9
Slaves Only	3	3
Slaves + Wealth Distinctions	4	7
Wealth Distinctions	2	4

N= 38   phi= .22
               p > .10

this sample there was little or no relationship between these variables. This negative result is not surprising. The causes of increased polarity should be linked with defensive problems and with the success of kinship groups in gaining political control rather than with wealth distinctions.

The emergence of social classes of the type found in modern industrial societies is obviously attributable to differences in the relations of different groups to the means of production. For example, those who own or control substantial amounts of capital in the United States are upper or middle class and think of themselves as such, whereas those who do not are more likely to think of themselves as working class.

A striking thing about social classes of the type found in modern industrial societies is their lack of cohesion. They are artificial designations that describe individuals and families who share some achieved or ascribed status. Another striking thing about these social classes is the absence in many societies of substantial mobility between them.

Presumably, social classes lack cohesion because their members have few interests that would be a basis of cooperative action. In modern industrial societies it is the nuclear family that has children and garners, augments, and transmits resources, not social classes.

Lack of substantial mobility between classes is presumably due to the importance of nuclear families as wealth holding units. The wealth of nuclear families is the sum of wealth acquired over the life cycle and wealth acquired by inheritance. A high ratio of life cycle to inherited wealth indicates a high rate of social mobility, a low ratio indicates a low rate. A study by Kotlikoff and Summers (1980)

estimated that about 19 percent of the total wealth in the United

States was due to life cycle savings, indicating a low ratio. This

suggests (if the United States is typical) that wealth held by nuclear

families and transmitted from generation to generation as inheritance

is the most important basis of inequality in industrial societies.

Some minority groups are in a particularly unfavorable economic

situation because of the inability of their members to intermarry and

acquire substantial wealth by inheritance. An example in the United

States is blacks. Unlike other minority groups, blacks have not

intermarried with whites in large numbers.

Competition for Political Offices

One of the most important types of competition that occurs within

political communities is for political offices. It occurs because

valuable resources or perquisites are attached to political offices

(see Chapter 8), especially those with greater authority, and it can

have important consequences for political communities.

One consequence of competition for offices is constant pressure

for both the concentration and the dispersion of sovereignty. On the

one hand, the incumbents of offices or their designated successors

attempt to suppress competition and promote the concentration of

political sovereignty. On the other hand, would be successors encour-

age competition and promote the dispersion of sovereignty.

Suppressing competition promotes the concentration of sovereign-

ty by making it easier for individuals, kin groups, or other groups

to monopolize offices. It becomes more difficult for challengers to

replace incumbents and their designated successors.

Encouraging competition promotes the dispersion of sovereignty by making it difficult for individuals, kin groups, or other groups to monopolize offices. It becomes easier to replace incumbents. If somebody holds a monopoly of offices, and competition results in his replacement and a loss of his monopoly, there is likely to be a dispersion of sovereignty.

I measured competition for political offices by gathering information on methods of succession to the highest executive office. In nearly every political community the incumbent of this office is sovereign in external defensive warfare. I focus on this office because of its functional importance and because of the tendency for more perquisites to be attached to it than to other offices. As a practical matter, however, there is very little information in the ethnographic literature on methods of succession to other offices.

I used a number of criteria to classify succession processes. The first criterion was the "mode" of succession. I defined "exclusively hereditary" as the restriction of succession to a kinship group with few or no exceptions. This mode presumably reflects a minimum degree of competition. I defined "hereditary in principle" as the restriction of succession to a kinship group but with some or many exceptions. This mode presumably reflects a moderate degree of competition. I defined "non-hereditary" as succession that is not restricted to a kinship group.

The second criterion, relevant only to hereditary modes of succession, is the "principle" of succession. I distinguish between patrilineal, matrilineal, and bilateral succession. With the patrilineal principle the designated successor is a blood relative in the male line.

With matrilineal succession the designated successor is a blood relative in the female line. With bilateral succession the designated successor can be a blood relative in either the male or female line.

The third criterion, also relevant only to hereditary modes of succession, is the "order" of succession. This refers to the sequence of designated successors, determined by things like kinship, sex, generation, and age.

The fourth criterion, relevant to both hereditary and non-hereditary modes, is the "method or methods" used to designate successors. These methods involve different degrees of intensity of competition for office.

One of these methods is the designation of a successor by the incumbent. With hereditary modes an incumbent chooses among potential successors when there is no order of succession, when the order is unclear, or when the designated successor is incapable. Since the incumbent makes the choice, potential successors must do his bidding.

Another of these methods is the informal recognition of a successor on the basis of influence, prestige, wealth, or other personal attributes. With hereditary modes this method is another way of choosing among potential successors when there is no order of succession, when the order is unclear, or when the designated successor is incapable. With the non-hereditary mode this method is a way of choosing a successor with specific attributes. This method presumably mitigates competition because it takes into account differences between potential successors without allowing them to be a basis of direct and open competition.

Another method is election by a council, assembly, or deliberative body. With hereditary modes this method is also a way of choosing among potential successors when there is no order of succession, when the order is unclear, or when the designated successor is incapable. With the non-hereditary mode this method is a formal way of allowing wider participation in the selection process. Since the successor is chosen by a group, there is less direct and open competition between potential successors.

Another method is election by a substantial fraction of the members of the political community. This method is characteristic only of the non-hereditary mode. It involves competition between potential successors but places sharp boundaries on its forms.

Another method is the attempt to oust incumbents or rival successors by intimidation, physical force, or military action. Such attempts, by definition, involve direct and open competition with essentially no boundaries on its forms.

The Incidence of Succession Processes. The incidence of different succession processes should be a measure of the intensity of competition for political offices. Some of these involve more intense competition than others.

(1) Mode of Succession. In looking at this I expected that hereditary succession would predominate over non-hereditary succession. There are a number of reasons why this should be so.

One reason is the military advantage associated with hereditary succession. Sovereignty in military activities is relatively clearcut and stable. There is less risk that the political community will be in disarray because of competition for office.

Another reason is the advantages of hereditary succession to incumbents. Since they generally have the right to hold their offices for life, challenges to their authority are illegitimate and can be suppressed with force. A right to hold office for life provides a more secure basis to use the perquisites of office for personal and family advantage. It also makes it easier to control subordinates who otherwise might be rivals for power.

The incumbents of offices that are not hereditary often try to establish hereditary succession as a way of transmitting offices and their perquisites to descendants. These attempts are associated with efforts to diminish the power of political rivals who may be trying to establish their own dynasty. In centralized political communities, such competition often leads to civil war (see Chapter 4).

The advantages of non-hereditary succession, if any, are much less transparent. Some of these methods, such as the attempt to oust incumbents or rival successors by intimidation, physical force, or military action, may leave a political community in disarray. Other methods, such as election, do not give incumbents a lifetime claim to their offices.

The non-hereditary mode of succession may be advantageous in some contexts. For example, in modern democracies incumbents often lack legitimacy if they are not elected to their offices (e.g., the non-elected presidents of the United States). Apparently, social conditions in modern democracies promote widespread public support for elections and discourage potential successors from using other methods of obtaining offices.

A possible benefit of the non-hereditary mode is more qualified officials because recruitment is not restricted to a single kinship group. This advantage, however, does not accrue to the incumbents but to the political community.

Table 7.19 shows the incidence of modes of succession in the political communities of the sample societies. As expected, the hereditary modes together were more common than the non-hereditary mode. This result suggests that incumbents are very influential in establishing methods of succession.

    (2) Principle of Succession. The principle of succession refers to the genealogical line, whether patrilineal, matrilineal, or bilateral, of the designated successor. The incidence of these lines should reflect the relative frequency and political significance of patri-kin, matri-kin, and bilateral kinship groups in political communities. As I showed above, patri-kin groups are both more common and more often politically significant than matri-kin groups. For this reason, patrilineal succession should be more common than other types. As Table 7.19 shows, this was so.

    (3) Order of Succession. The order of succession refers to the sequence of designated successors. This sequence, when it exists, should reflect the relative advantage to incumbents of having one relative or another as a successor. According to the theory of inclusive fitness, an incumbent should prefer as a successor that relative who would be most effective in using the perquisites of office in ways that enhanced his (the incumbent's) inclusive fitness. These should be relatives who are closely related and can effectively use the perquisites for reproduction.

Table 7.19: Mode of Succession to Political Office

	Number of Societies
Exclusively Hereditary[a]	
patrilineal	15
matrilineal	1
bilateral	_1
	17
Hereditary in Principle[b]	
patrilineal	10
matrilineal	5
bilateral	_1
	16
Not Hereditary	_21
Total	54

[a] restriction of succession to a kinship group with few or no exceptions

[b] restriction of succession to a kinship group but with some or many exceptions (e.g., competition sometimes occurs for the position)

The data that I collected on the established order of succession allow a general test of this hypothesis. With the patrilineal principle, the order of succession should favor sons (r= 1/2) or brothers (r= 1/2 on average with the same mother, 1/4 otherwise) rather than male relatives who are less closely related. Table 7.20 shows that this was true. With the patrilineal principle, sons were first in order in 71 percent of the societies, brothers in 29 percent. In cases where sons were first in order, brothers were usually second, and vice versa.

With the matrilineal principle, the order of succession should favor brothers (r= 1/2 on average with the same mother, 1/4 otherwise) or sister's sons (r= 1/4 on average with the same mother, 1/8 otherwise). Table 7.20 shows that this was also true.

Also noteworthy is the importance of age and generation in determining the order of succession. In many political communities the established order of succession also designates which among the sons, brothers, or sisters' children are first in order. When such designations exist, the individual who is first in order is generally older and presumably, because of his experience, more capable of using the perquisites of political office for personal and family advantage.

(4) Methods of Succession. Methods of succession vary greatly across political communities. These methods oftentimes are not established firmly, and therefore, are subject to change or manipulation. It is more appropriate, therefore, to look at all of the methods of succession that are used within political communities rather than just the established one.

The relative incidence of different methods of succession should to some extent reflect the greater frequency of hereditary modes of

Table 7.20: Order of Succession to Political Office

	Number of Societies	
	1st in order	2nd in order
Patrilineal Mode:		
son or eldest son	20	8
brother or younger brother	8	6
Matrilineal Mode:		
younger brother	3	
sister's son	2	2
other	1	1
Bilateral Mode:		
brother	1	
other		1

succession. For example, election should not be an especially common method of succession when the mode is exclusively hereditary; neither should the ousting of rivals by intimidation, physical force, or military action.

Table 7.21 shows the relative incidence of different methods of succession, controlling for the mode of succession. Looking at the overall incidence of methods (the column on the right), it is apparent that the most common method was informal recognition of a successor on the basis of influence prestige, wealth, or personal attributes. This method was especially common when the mode was exclusively heredtiary, an indication of the pivotal role of politically prominent kin-groups with such a mode. Three other methods were about equally common. The least common method was election by a substantial fraction of members of the political community.

Perhaps the most surprising result in Table 7.21 is the relatively high incidence (25 percent of societies) of ousting of rivals by intimidation, physical force, or military action. This method is especially common where the mode of succession is "hereditary in principle," a situation in which a single kinship group is not politically dominant. The high incidence of this method suggests that control of the succession process is in many instances tenuous at best. The perquisites of political office are often sufficient to encourage potential successors to engage in open and direct competition.

Succession Processes and Polarity. A reciprocal relationship should exist between succession processes and the degree of concentration of sovereignty in political communities. On the one hand, processes that suppress competition should increase asymmetries of

Table 7.21: Activities in the Succession Process by
the Mode of Succession

Mode of Succession

Activities		Non-Hereditary	Hereditary in Principle	Exclusively Hereditary	Overall
informal recognition on the basis of influence, prestige, wealth or personal attributes	%yes	22	57 ϕ= .35 **	62	47
election by a council, assembly, or deliberative body	%yes	11	22 ϕ= .22	33	23
election by a substantial fraction of members of the political community	%yes	0	6 ϕ= .13	5	4
appointment by a higher authority/incumbent	%yes	28	29 ϕ= .11	19	25
ousting of rivals by intimidation, physical force, military action	%yes	22	47 ϕ= .36 **	10	25

N= 56

*** p < .01   ** p < .05   * p < .10

political power and result in a greater concentration of sovereignty. Alternatively, processes of succession that promote competition should decrease asymmetries of political power and result in a lesser concentration of sovereignty.

On the other hand, a high concentration of sovereignty enables those who hold power to suppress competition for political office by establishing processes of succession that do this. Alternatively, a low concentration of sovereignty makes it difficult to suppress competition for political office and may promote the use of processes of succession involving greater competition.

To test these hypotheses I will use my measure of polarity as an indicator of the degree of concentration of sovereignty in political communities. I will classify political communities, as I did above, into two groups: high polarity, in which sovereignty in military activities is held by a single individual and/or group, and low polarity, in which such sovereignty is lacking or in which it is absent.

With regard to the mode of succession, it seems likely that the non-hereditary mode would be associated with low polarity, the hereditary modes with high polarity. Table 7.22 shows this relationship. While the relationship was in the expected direction, it was not strong and was not statistically significant. That the relationship was not strong suggests that there were other causes of both the mode of succession and of polarity (i.e., presumably, conditions of external polity) so that the mode of succession is not explained entirely by polarity, or vice versa.

With regard to methods of succession, those which involve intense competition should be associated with low polarity, and those which

Table 7.22: Mode of Succession to Political Office
and Polarity

	Polarity	
Mode of Succession	Low	High
Not Hereditary	6	4
Hereditary in Principle	4	12
Exclusively Hereditary	4	7

N= 37   phi= .30
                     p > .10

involve less intense competition should be associated with high polarity. For example, a method that involves intense competition, such as the ousting of rivals by intimidation, physical force, or military action, should occur more frequently in low polarity political communities. Methods that involve less intense competition, such as appointment by a higher authority/incumbent, or informal recognition on the basis of influence, prestige, wealth, or personal attributes, should occur more frequently in high polarity political communities.

Table 7.23 shows these relationships. Uniformly, the relationships were weak and not statistically significant. In one case ("ousting...") the relationship was not in the predicted direction. There is little evidence, therefore, that methods of succession are strongly associated with polarity.

Although the notion that processes of succession have a great deal to do with the concentration of sovereignty (or vice versa) is intuitively pleasing, the evidence that would support such a hypothesis is rather weak and is occasionally contradictory. There are several possible reasons for this. First, as I showed in Chapter 6, problems of external polity have a strong effect upon the concentration of sovereignty within political communities. The effects of these problems upon political structure apparently greatly outweigh the effects of competition within political communities. Second, as I will show in Chapter 8, the degree of concentration of sovereignty within political communities is positively correlated with perquisites of office. While a high concentration of sovereignty encourages political officials to suppress competition for office, high perquisites encourage potential successors to promote competition.

Table 7.23: Activities in the Succession Process
and Polarity

Activities	phi(ϕ)
informal recognition on the basis of influence, prestige, wealth, or personal attributes	.00
election by a council, assembly, or deliberative body	.19
election by a substantial fraction of members of the political community	.20
ousting of rivals by intimidation, physical force, military action	.13

N= 57

Succession Processes and Perquisites of Political Power. Com-
petition for political offices should be more intense if offices have
substantial resources or perquisites attached to them. There is presum-
ably little advantage to a potential successor in competing for a
political office if it has little or no value.

To test this hypothesis I gathered information on the incidence of
perquisites attached to the highest executive office (see Chapter 8).
There were 17 of these, including sexual and marital perquisites, the
services of retainers, prestige items, nepotism, material perquisites,
and special exemptions. I divided political communities into two
groups: those in which perquisites of office were low (0-8 were
indicated) and those in which they were high (9-17).

The method of succession that involves the most intense competi-
tion is the ousting of rivals by intimidation, physical force, or mil-
itary action. This method should be especially common in political
communities in which the perquisites of office are high. Table 7.24
shows this relationship. It is strong and in the predicted direction.
Perquisites are apparently a major factor promoting direct and open
competition for political offices.

Fissioning

The process of fissioning occurs whenever a political community
divides to form separate, autonomous political communities. Although
the immediate reasons for fissioning vary greatly, all of these are
linked in one way or another with competition between people within
political communities for reproductive resources. As competition
becomes more intense the costs of living for individuals increase

Table 7.24: Political Perquisites and the Ousting of
Rivals

	Ousting of Rivals by Intimidation, Physical Force, Military Action	
Political Perquisites	No[a]	Yes
Low (0 – 8)	42	5
High (9 – 17)	1	9

N= 57   phi= .70
p < .01

[a] ousting of rivals by intimidation, physical force, or military action was not indicated in the ethnographic sources

to the point where they exceed the benefits. At that point it is of advantage for people who suffer from the costs of intensified competition to leave the political community and either go to another one or set up a separate one.

The process of fissioning can have substantial consequences for the structure of political communities. It is a centrifugal force, inhibiting or reversing tendencies toward greater political centralization and polarity. The fissioning of a large political community, such as the Roman empire, typically results in the creation of two or more smaller, less centralized, and less powerful political communities. Competition within these more numerous political communities, especially for political offices, is much less intense than in the political community that fissioned. With more political communities, there is more sovereignty, political offices, and perquisites.

The conditions that encourage fissioning should be linked either with larger costs or smaller benefits of group living. The conditions that discourage fissioning should be linked either with smaller costs or larger benefits.

In order to determine the conditions that encourage or discourage fissioning, I attempted to identify instances of fissioning (or attempted fissioning) and the condition or conditions that seemed to precipitate it. For many societies, due to the lack of information, this was difficult or impossible to do systematically. The most that I was able to do was to identify instances of fissioning and to note the reasons given by the ethnographer for it, or to note the event(s) that preceded it. I was unable to analyze fissioning in a systematic way by using statistical tests. In spite of this,

however, the information that I was able to gather on fissioning does give some indication of the conditions that encourage or discourage it.

Population Growth. One of the conditions that seems to encourage fissioning is population growth. In the absence of fissioning, population growth results in higher population densities. This leads to intensified competition for resources such as food, land for agriculture and grazing, shelters, and mates. The only situation in which higher population densities do not result in intensified competition occurs when technological improvements compensate for a declining resource base. For most of cultural history, however, the pace of technological improvements has lagged far behind the level necessary to sustain higher population densities. The inevitable consequence of population growth, therefore, was fissioning of political communities. People left their own political communities to set up new ones.

Fissioning due to population growth was the process directly responsible for the migration of human populations to virtually all areas of the world. Robert Carneiro (1978) has estimated that fissioning resulted in an almost steady increase in the number of political communities until a peak number of about 800,000 was reached around 1,000 B.C. After that point in time the addition of political communities due to fissioning was counterbalanced by their subtraction due to conquest.

Most anthropological studies relevant to the impact of population growth on fissioning are based upon field work conducted in the 1960s and earlier when small political communities in Africa, Oceania, and South America enjoyed a greater degree of autonomy than they do today.

Studies by Bohannan (1954) and Sahlins (1961) of the Tiv, a tribe in Africa, have identified the important relationships that exist between population growth, land shortages, fissioning, and warfare. In the case of the Tiv, population growth within lineages forced them to fission into separate segments with one or more of the segments migrating outward, encroaching onto the land of other tribes. The segments of Tiv lineages were genealogically aligned, and this provided a basis of alliance by the Tiv in case their attempts at encroachment led to war.

A study by Vayda (1961) of the history of the Maori of New Zealand suggests that population growth is also an important cause of fissioning in Oceania. In areas where virgin land was unavailable, Maori villages would ally with closely related villages and go to war to secure additional land at the expense of other villages. This additional land, in turn, facilitated fissioning and further population growth. Unlike the studies of Bohannan and Sahlins, however, Vayda thought that war promoted population growth rather than ameliorated its effects.

A study by Silltoe (1977) of the causes of warfare in New Guinea suggests that fissioning may be impeded under some conditions. He found no evidence to support the hypothesis that ecological pressure due to high population densities and a lack of land was a significant cause of war in New Guinea; rather, most wars started for political reasons. Unfortunately, he did not discuss what these political reasons included. Supposedly, they might have arisen over disputes about land, women, pigs, or some other resource.

The situation in New Guinea was also anomalous because, although population densities were high, there was a large amount of uninhabited land which should have promoted fissioning. Presumably, fissioning did not occur because the threat of warfare made it dangerous to exploit uninhabited land.

The most extensive study of fissioning is that conducted by Chagnon (1976; 1979b) of the Yanomamö. He found that fissioning was more common in large villages in which exploitation was more intense. The opportunities of headmen and their male relatives to secure mates by exploiting "reciprocal" exchanges of women or by simply seizing the wives of other men were greater in large than in small villages. It seems likely that in large villages there is a greater chance of asymmetries of power emerging between lineages because of the greater number of lineages and the looser ties between them.

Substantial polygyny in large villages results in a chronic shortage of women and intense competition for them. Seduction and adultery are commonplace and can result in club fights that divide villages into factions of closely related kin. If disputes are not resolved to the satisfaction of one of the factions, or if one of them should lose the fight, fissioning may occur (Chagnon & Bugos, 1979).

These studies of fissioning suggest that it is a safety valve that diminishes the intensity of competition between individuals, kin groups, and other groups caused by population growth and high population densities. It is apparent that high population densities are not unambiguously associated with the shortage of a particular resource such as food, land, or mates but rather may be associated with shortages of one or more of these resources.

Among the sample societies, I was able to identify ten societies in which population growth was a cause of fissioning. About half were African societies that engaged either in agriculture or pastoralism and fissioned like the Tiv to acquire or exploit land (Bunda, Babwa, Iraqw, Nama, Ahaggaren, Dinka). It is quite likely, however, that population growth was a much more common cause of fissioning of political communities than is apparent from ethnographic accounts. In most cases ethnographers do not attribute fissioning to population growth but rather to more readily identifiable causes such as disputes arising over adultery, land encroachment, and murder.

Exploitation. Another condition that seems to encourage fissioning is exploitation of the weak by those who hold economic, social, and political power. This imposes additional costs upon the weak. These may increase to the point where they exceed the benefits of living within the political community. At that point, fissioning should occur.

The most visible indication of exploitation within political communities is substantial inequality of access to or control of reproductive resources such as mates, land, animals, and houses. In simple political communities, inequality is apparent from such things as the ranking of kin groups, patterns of land holding, control of political offices, and polygyny. In complex political communities, inequality is apparent from one or more of the items above in addition to other bases of inequality such as control of capital, the holding of special skills, and wealth.

There can be little doubth that inequality of access to or control of resources is a major cause of friction between people in

political communities. Those with power regularly try to exploit and enhance the advantages they enjoy, those without it regularly try to mitigate the consequences to themselves of such exploitation.

Several options available to those without power are to emigrate and to promote the fissioning of their political community. When emigration or fissioning of this type occurs within political communities it is typically preceded by a dispute that makes existing imbalances of power and the alignment of individuals, kin groups, and other groups behind the parties to the dispute transparent.

A study by Chagnon and Bugos (1979) of club fights between factions of Yanomamö is an illustration of the dynamics of fissioning processes in simple political communities. In these fights the initial parties to the dispute seek allies among their close male relatives. In some instances, such as in the case of serious injury, such disputes can result in fissioning with the weaker party to the dispute leaving.

I was able to record 24 societies in which exploitation was a likely cause of fissioning of political communities. In clearly recorded instances of fissioning the most common cause was feud due to murder or some other dispute that could not be resolved by compensation.

Perquisites of Political Offices. A third condition that encourages fissioning is the existence of political offices with substantial perquisites. These promote intensified competition for political offices. In multi-levelled political communities, such as chiefdoms and states, officials at lower levels may initiate civil war to secure political autonomy for their subdivisions and enhance their own perquisites. If successful, fissioning of the political community is the result. Subordinate officials may also gain the

support of certain military units and use these to initiate a coup against other incumbents. If the attempt is indecisive, civil war may break out, and fissioning occur.

In the sample societies I was able to record 8 societies in which competition between political officials and their challengers for offices with visible and large perquisites was the direct cause of fissioning or attempted fissioning. In most cases the political community involved was complex (Thonga, Kuba, Songhai, Ahaggaren, Okinawans, Gujarati, Tongans). Only one was not complex (Manihikians).

Dispersion of Resources. Another condition that encourages fissioning is the wide dispersion of significant resources. Nucleation due to external threat results in higher population densities and scarcity of resources. This scarcity is especially severe when there is a wide dispersion of resources, especially of food sources. This scarcity may compel a political community to fission even though there are defensive advantages to staying together as a single unit. In many American Indian tribes the tribal political community existed only seasonally. For example, the bands of Kiowa would gather as a "tribe" in the midsummer for the annual sun dance. During other seasons the tribal political community would separate into its component bands to more effectively exploit food resources, such as the buffalo, that were widely distributed. Among the sample societies I was able to identify eight societies in which fissioning of political communities was linked with the seasonal dispersion of resources.

Other Causes of Fissioning. Some causes of fissioning are the consequences of defeat in warfare rather than of competition within political communities. Defeat in warfare can result in the destruction

of political communities and the flight or scattering of the survivors. These survivors may emigrate to other political communities, gather to form another political community, or form smaller groups that are difficult to find and attack. In the latter situation, although fissioning has occurred, it might be more appropriate to use another word such as "disintegration" to describe what has happened since the cause in this case is clearly of external origin.

Among the sample societies, I was able to record seven societies in which fissioning by disintegration occurred. For several societies (Dorobo, Selung) it is probable that fissioning by disintegration led to a reduction in the complexity of political communities and/or to their destruction.

The advent of colonialism was often accompanied by pacification. Colonial authorities suppressed warfare between indigenous political communities. Such pacification made it safer for people to emigrate out of populated, defensible areas into areas that were not exploited previously because of the danger of warfare. Among the sample societies, I was able to identify five societies in which fissioning of this type occurred.

Summary

The most important cost of group living in humans is competition with other individuals, kin groups, and other groups for resources. Warfare between political communities typically intensifies such competition by causing nucleation and higher population densities. Political officials respond to intensified competition by extending sovereignty into non-military areas, especially those linked with social

control.

The kinship group is an important basis of alliance in political communities. The origin of kinship groups of different types is probably tied to problems of defense, but such groups also became a basis of competition within political communities. The most important form that such competition takes is competition for political offices. The existence of hereditary succession indicates success by a particular kinship group in acquiring dominance within a political community by suppressing competition. Competition for political offices is encouraged whenever substantial perquisites are attached to offices.

Competition within political communities in some instances results in fissioning and a reduction in their size and structural complexity. In this sense, competition is a centrifugal force promoting a reduction in centralization and polarity. Warfare and the threat of warfare, however, discourage fissioning. To the extent that fissioning is discouraged, social exploitation within political communities is encouraged.

CHAPTER 8

THE REPRODUCTIVE USES OF POWER

In this chapter I will look at a phenomenon that is correlated
with but is incidental to political centralization -- the use of politi-
cal power for personal and family advantage. My argument is quite
simple. As political communities become larger and structurally more
complex, asymmetries of political power increase. Such asymmetries
are exploited by political officials for personal and family advantage
in ways that tend to enhance their own inclusive fitnesses. The econ-
omic, social, and reproductive benefits that derive from asymmetries
of power reinforce and provide incentives toward the political behav-
iors that sustain such asymmetries.

Perquisites of Power

In every political community power confers benefits. These can
include sexual privileges, opportunities to assist relatives, pres-
tige, the services of retainers, material advantages, and exemptions.
These things are highly desirable because they are psychologically
(or phenotypically) rewarding.

The nature and distribution of such benefits, to my knowledge,
have never been the subject of a comprehensive, comparative study.
There is a marked tendency for studies of political elites to focus
upon only one or a few of the benefits of political power to the

exclusion of others. The Marxist theorist, for example, is likely to focus upon material benefits. Other theorists focus upon the psychological benefits that flow from the satisfaction of "power drives" although there is much disagreement as to the origin, development, and purpose of such drives (cf., Lasswell, 1965).

There has also been a tendency for studies of political elites to overlook nepotism despite its obvious significance in political recruitment. Also, perhaps because of the topic's sensitivity, studies have ignored benefits such as sexual privileges. A recent study by Napoleon Chagnon of the Yanomamö (1979a) is an exception. He found that a strong relationship existed between political power, number of wives, and reproductive success.

My objective is to put findings such as Chagnon's into perspective by providing a comparative overview of the benefits of political power. Since so little is known in this area, it is useful to present Table 8.1 that shows the incidence of various benefits so far as I could determine from the ethnographic data.

In looking at benefits, I focus upon the individual who was sovereign in external defensive warfare. The sovereign in this activity is also usually sovereign in others and so is typically a chief executive. A list of the titles of these political officials is contained in Appendix E.

The percentages presented in Table 8.1 are minimum percentages since it was impossible to determine reliably those societies in which particular benefits were not present.

Any interpretation of these percentages depends to some extent upon a subjective assessment of the adequacy of the ethnographic

Table 8.1: Reported Incidence of Various Perquisites
of Power

	Percent[a]	N
Sexual and Marital Perquisites:		
polygyny, disproportionate number of wives	53	(32)
access to women as concubines	15	(9)
elite endogamy	30	(18)
privilege of incest, violation of marriage rules	8	(5)
Services of Retainers:		
slaves and/or servants	30	(18)
eunuchs	5	(3)
bodyguards	23	(14)
access to the labor of citizens	22	(13)
Prestige:		
isolation	12	(7)
ornamentation, e.g., special dress	45	(27)
deference	27	(16)
exaltation or worship of ancestors	27	(16)
relatives occupy positions of political authority or act as important advisors	40	(24)
Material Perquisites:		
receives gifts	20	(12)
collects taxes, tribute, or labor services	22	(13)
Special Exemptions:		
exempt from combat	13	(8)
exempt from particular customs, laws, etc.	12	(7)
exempt from manual labor	22	(13)

a   minimum percentages of the incidence of benefits

information. My own view is that the ethnographies, many of which were written by non-professionals, focus disproportionately on cultural items that are unusual or colorful at the expense of items that are ordinary or dull. The distinctive dress and ornaments of political elites are noticed rather than their day-to-day activities. There may also be some underreporting of items associated with usages of political power that are discouraged in Western societies, such as concubinage and nepotism.

Remembering these caveats, the table seems to show that the benefits of political power are extraordinarily diverse. Polygyny was very common, occurring more frequently than any other benefit. Ornamentation was also common, probably because of its correlation with polygyny (Low, 1979). Nepotism was also fairly common. Various economic and material advantages were not too common, perhaps because they were not reported as often.

Perquisites and Asymmetries of Power

Although the notion that political power has its own rewards may be true, it is somewhat deceptive because it deflects attention from the many tangible benefits that are the trappings of political power. It also deflects attention from the ways in which political power is used to augment tangible benefits.

If political power is used for reproductive purposes, asymmetries of power should be positively correlated with various tangible benefits. This should be true in particular of benefits with direct relevance to reproductive success such as polygyny, concubines, endogamy, and nepotism.

To test this hypothesis I will use "polarity" as an indicator of asymmetry of political power. It is a measure of the extent to which sovereignty in various political activities is held by a single individual and/or group. It has eight codes, reflecting greater or lesser degrees of concentration of sovereignty (see Chapter 7). To simplify analysis, however, I will divide societies into two categories: societies with political communities in which there was high polarity (at a minimum, sovereignty in all military activities was held by a single individual and/or group) and those in which there was low polarity (a dispersion of sovereignty in one or more military activities, or no sovereignty).

Measures of the incidence of various perquisites, as I indicated above, cannot be especially satisfactory because of the difficulty of ascertaining the societies in which perquisites were not present. Nevertheless, I will use the following measure to code for the probable presence or absence of a perquisite: indicated, not indicated. My assumption is that those perquisites not mentioned in ethnographies (i.e., not indicated) are likely to be absent.

Table 8.2 shows the relationships that existed between polarity and various perquisites. The two columns on the left indicate the incidence of perquisites in low polarity and high polarity societies, respectively. The column on the right presents values of phi. A large phi indicates that high polarity (a large asymmetry of power) is associated with the presence of a perquisite and low polarity with its absence.

Looking first at the incidence of perquisites, it is apparent that the most common in high polarity political communities were

Table 8.2: Polarity and Perquisites of Political Power

	% in low polarity societies	% in high polarity societies	Phi
Sexual or Marital Perquisites:			
polygyny, disproportionate number of wives	40	74	.34 **
access to females as concubines	7	35	.32 **
elite endogamy	13	65	.51 ***
privilege of incest, violation of marriage rules	0	22	.31 *
Services of Retainers:			
slaves and/or servants	33	48	.14
eunuchs	0	13	.24
bodyguards	13	48	.36 **
access to labor of citizens	13	44	.32 *
Prestige & Nepotism:			
isolation	7	26	.24
ornamentation, e.g., special dress	47	57	.10
deference	13	52	.39 **
exaltation or worship of ancestors	7	48	.43 ***
relatives occupy positions of political authority or act as important advisors	27	70	.42 ***
Material Perquisites:			
receives gifts	20	35	.16
collects taxes, tribute, or labor services	13	57	.43 ***
Special Exemptions:			
exempt from combat	7	30	.29 *
exempt from particular customs, laws, etc.	7	26	.24
exempt from manual labor	20	39	.20
	N= 15	N= 23	

*** p < .01   ** p < .05   * p < .10

polygyny, elite endogamy, ornamentation, deference, and the collection of taxes, tribute, and labor services. A majority of sovereigns in high polarity societies had these perquisites. The incidence of perquisites in low polarity societies was generally much lower. The most common was ornamentation. Several perquisites -- privilege of incest and eunuchs -- were entirely absent from low polarity societies, suggesting their association with extreme asymmetries of power.

The values of phi support my hypothesis that asymmetries of political power are most strongly correlated with perquisites with direct relevance to reproductive success such as polygyny, concubines, endogamy, and nepotism.

The values of phi for several other perquisites, such as body-guards, deference, the exaltation or worship of ancestors, and the collection of taxes, tribute, and labor services, were also large. The first two of these I classified as prestige perquisites, although it was clear that they also exist for other reasons. Bodyguards often intimidate political opponents as well as increase the personal safety of officials, their families, and their advisors, making it easier for them to carry out their duties. The exaltation or worship of ancestors, when linked with hereditary succession, is a way of reinforcing existing kinship based asymmetries of political power. The third of these is a material perquisite. The collection of taxes, tribute, and labor services may affect inclusive fitness indirectly if such resources are used to assist wives, children, and other relatives.

The values of phi for other perquisites were somewhat lower. There was little relationship between polarity and ornamentation, probably because special dress, insignia, and similar trappings are

inexpensive and thus are easily acquired no matter how little power a political official holds.

To gauge the overall relationship between polarity and perquisites I counted the total number of perquisites for each political official. I then divided officials into two groups: those with a small number of perquisites (0-8), and those with a large number (9-17). I expected that high polarity would be associated with a large number of perquisites. Table 8.3 presents the results of this analysis. The relationship was strong (phi= .52) and in the predicted direction. A noteworthy aspect of the relationship is the absence of officials with a large number of perquisites in low polarity political communities.

Polygyny

One of the most interesting perquisites from a theoretical perspective is polygyny. In polygynous species, such as humans, there is typically for males a positive correlation between number of mates and number of offspring. In regard to human societies, it seems reasonable to hypothesize that in most times and places a positive relationship has existed between asymmetries of political power and variance in male reproductive success.

A direct test of this hypothesis for the sample societies is impossible because of a lack of information on the number of wives and children of political officials. There is some anecdotal information that indicates that large asymmetries of power are quite often linked with extraordinarily high reproductive success. For example, the Askia Mohammed of Songhai is reported to have had

Table 8.3: Polarity and the Overall Number of Perquisites

	Number of Perquisites	
Polarity	0-8	9-17
Low	15	0
High	12	11

N= 38

phi= .52
p < .01

100 or more sons (Hama, 1968:178). One of the Incas is reported to

have had 500 descendants (Rowe, 1946:257). The chief of the Thonga

is reported to have had from 30 to 50 wives (Junod, 1927, Vol. 1:377,

381,408). The chief of the Aztecs, Moteczeuma, aside from his single

legitimate wife, is reported to have had anywhere from 100 to 1,000

secondary wives and 150 children (Soustelle, 1970:158,179,182;

Vaillant, 1941:231).

Although a direct test of this hypothesis is impossible, I did

obtain an indirect (or instrumental) measure of the variance in male

reproductive success. This was the society's "breeding system."

My measure of the breeding system has seven different codes. I

defined "extraordinary polygyny" as a breeding system in which a

single member of the political elite has more than 10 wives. I

defined "moderate polygyny" as a breeding system in which a single

member of the political elite or subordinates have from 2 to 10

wives each. I defined "moderate polygyny widespread" as a breeding

system in which non-elites of high rank, wealth, or distinction also

commonly have from 2 to 10 wives each. I defined "ecological

monogamy" as a breeding system in which some men engage in polygyny

but in which it is uncommon because of methods of subsistence. I

defined "culturally imposed monogamy" as a breeding system in which

elites and others of high rank, wealth, or distinction are each

allowed only a single wife at a time, although they may have concubines

or engage in serial monogamy. I defined "polyandry" as a breeding

system in which females of high rank, wealth, or distinction are

allowed to have plural husbands. Since polyandry is uncommon, it is

typically a supplemental rather than the predominant breeding system.

(Polyandry was reported to exist in only four of the sample societies).

My hypothesis is that high polarity (asymmetries of political power) should be associated with extraordinary polygyny and moderate polygyny. Low polarity should be associated with moderate polygyny widespread and with ecological monogamy.

I have no prediction for culturally imposed monogamy. Since this breeding system seems to curtail the reproductive opportunities of political officials, its high incidence within large, modern states is an anomaly. One possibility is that this reflects the military successes of the Western nations which were the carriers of Christianity and other egalitarian ideologies. Another possibility is that non-elites somehow won out in competition with elites for important resources such as women and access to political offices. Although elites continued to hold large wealth, polygyny and nepotism were curbed.

To test this hypothesis I collapsed cases of moderate polygyny with extraordinary polygyny (there were only three societies with moderate polygyny). I also deleted cases of culturally imposed monogamy for which I had no prediction. Table 8.4 shows the results of this test.

It shows that high polarity was associated with extraordinary polygyny and moderate polygyny, although the overall relationship was not statistically significant. Perhaps the most interesting thing about this relationship is that there was only a single case of low polarity associated with extraordinary polygyny and moderate polygyny. This suggests that high polarity is possibly a necessary condition for the existence of these breeding systems. It is uncommon (or rare) for extreme asymmetries of reproductive opportunities to exist without large asymmetries of political power.

Table 8.4: Polarity and the Breeding System

Polarity	Breeding System		
	Ecological Monogamy	Moderate Polygyny Widespread	Moderate Polygyny, Extraordinary Polygyny
Low	4	9	1
High	3	10	8

N= 35

phi= .35
p > .10

Among all of the perquisites of political power, it is arguable that none have so large and direct an effect upon reproductive success as does polygyny. A political official who acquires multiple wives and concubines, as did Idi Amin of Uganda, makes use of and flaunts his power in a way that is both obvious and intimidating to other men. An official who exploits his power in this fashion lives dangerously because he tempts others with less power and fewer perquisites to try and overthrow him.

In some primate species including yellow baboons, langurs, and chimpanzees, subordinate males are known to form coalitions to challenge and possibly displace a dominant male. Since dominance is associated with access to oestrous females, this ganging up behavior presumably diminishes the variance in reproductive success among males.

This suggests for humans that extreme asymmetries of power, when exploited by officials for personal advantage, are intrinsically unstable and will eventually be challenged. The existence of egalitarian political structures such as legislatures, interest groups, and political parties in all modern nation states, no matter how decadent or oligarchical they might be, probably reflects the inevitability of tendencies toward multipolarity under modern economic and social conditions.

Economic Exploitation

A common theme in Western political thought is that political power is used principally for economic advantage. The focus of research is upon inequalities in the distribution of wealth (or

capital) and the translation of these into asymmetries of political power.

Marxist theory is the most popular version of this theme. According to Marx and Engels, the owners of capital establish and use the state and its instruments of coercion such as the police to exploit labor and expropriate its surplus value.

As a theory of the origin of the state, however, Marxist theory is simply wrong. There is little or no evidence in the archaeological or historical record that ownership of capital or the means of production was a significant basis of political power in the types of political communities that preceded the state (i.e., tribes, chiefdoms) or for that matter in early states (Claessen and Skalnik, 1978; Service, 1978).

It seems more reasonable that the correlation that exists within states, especially modern industrial states, between economic and political power is a consequence of the opportunities for economic exploitation that are generated by external military problems.

Among the sample societies, the Inca is perhaps the best example of this process. The successful conquests by the Inca over neighboring chiefdoms and tribes brought in new crown land and additional corvée labor (called the mit'a levy). The Inca used the food grown on this crown land to stock warehouses for use by military units. He used the corvée labor to construct public works with military purposes such as fortifications and roads. It is apparent, however, that the Inca was also able to use these resources to support himself, his family, and political officials and retainers.

Although the Inca depended principally upon external economic

exploitation or imperialism to meet his military needs, military problems also seemed to facilitate internal economic exploitation. This is a pattern that is characteristic of modern industrial states such as the United States in which an increase in military threat or war itself results in a significant increase in governmental spending upon defense and disproportionate benefits for those who supply goods and services to the military.

To test this idea about the relevance of problems of external polity to economic exploitation, I gathered information on the methods used by the sovereign in external defensive warfare to sustain himself, his subordinates, and the political activities in which he engaged. This official, as I showed in Chapter 6, is also generally sovereign in the collection of taxes, tribute, and labor services. The coding scheme that I adopted was based mostly on codes used in an earlier study by Tuden and Marshall (1972) and includes 12 different revenue sources or methods of support. These are listed in Table 8.6.

In Chapter 6 I showed that particular types of threats, namely the existence of an enemy who is capable of seizing land or is capable of conquest and subjugation, promote high polarity. The military responses to such threats should generate increased opportunities for exploitation. It would seem, therefore, that high polarity should be associated with a greater number of methods of support. Also, high polarity means an asymmetry of political power and presumably an enhanced ability to engage in economic exploitation. Table 8.5 shows the relationship between polarity and the number of methods of support. It shows that the relationship was

Table 8.5: Polarity and Methods of Support

Polarity	Number of Methods of Support		
	1-2	3	4-5
Low	8	3	2
High	5	4	9

N= 31

phi= .39
p < .10

Table 8.6: Centralization and Methods of Support

	Uncentralized		Centralized	
	Predominant Method (%)	% Using Method	Predominant Method (%)	% Using Method
direct subsistence	30	50	21	21
labor or products from slaves or unfree dependents	0	20	7	7
rents or income from land including production by serfs or peons	10	10	21	50
income and profits from trading	5	15	7	50
income and profits from business	0	5	0	7
contributions/taxes/labor of free citizens	25	50	14	43
perquisites from holding office such as salaries/fees/ commissions/privileges/ bribes	0	25	7	43
plunder/trophies/captives in warfare	10	40	7	14
tribute/taxes levied against conquered or subject people	0	0	14	64
payments/privileges/contributions for priestly or shamanistic services	0	0	0	0
head or member of wealthiest/strongest kin group	20	35	0	7
control over marriageable women	0	15	0	0
	100 (20)		100 (14)	

in the expected direction but was not especially strong.

Second, it seems likely that centralized political communities

(three or four territorial levels) would be associated with increased

reliance by sovereigns upon external methods of revenue and support.

This seems likely because centralized political communities wage war

for purposes of conquest and subjugation. Of the 12 methods of

support, three are clearly external methods: income and profits from

trading, plunder/trophies/captives in warfare, and tribute/taxes

levied against conquered or subject people. These three should be

more important and prominent in centralized than in uncentralized

political communities.

Table 8.6 shows the incidence of different methods of support

in uncentralized and centralized political communities. It shows

that these three methods were the predominant method of support in

15 percent of uncentralized political communites versus 28 percent

of centralized ones. It is important to note that the most common

method of support for sovereigns in centralized political communities

was tribute/taxes levied against conquered or subject people. While

this is certainly coercive exploitation, it is the exploitation of

a subject population by an imperial political community, not the

exploitation of labor by capital.

Summary

The use of political power for personal and family advantage is

an omnipresent phenomenon of political communities and a direct conse-

quence of asymmetries of political power. The relationship between

asymmetries of political power and perquisites is particularly strong

for those perquisites that are of reproductive significance such as polygyny, concubinage, endogamy, and nepotism.

The patterns of economic exploitation that exist within political communities are to some extent a consequence of problems of external polity as these generate opportunities for economic exploitation. Sovereigns in centralized political communities rely far more often than those in uncentralized ones upon external sources of support. The evidence is not consistent with Marx and Engels' theory of the origins of the state by means of internal economic exploitation.

CHAPTER 9

CONCLUSION

Since the publication of <u>The Origin of Species</u> there has been a general consensus by scientists that Homo sapiens like all other species on earth is a consequence of evolutionary processes that have existed for billions of years since the origin of life. In spite of this it was not widely accepted, at least by social scientists, that evolutionary processes were essential to explanations of human social behavior. There were a number of reasons for this, but the most important were the enormous differences that existed between humans and other species, especially those that reflected the possession by humans of culture, so that the relevance of biological processes occurring over millions of years to things as labile as human social behavior seemed remote at best.

This is no longer a valid reason, if it ever was, for rejecting out of hand the necessity of evolutionary theory to explanations of human social behavior. The number of studies that have tested evolutionary hypotheses about human social behavior has increased steadily in recent years. All of these build upon important theoretical developments in the field of evolutionary biology contained in the books and papers of George Williams (1957, 1966), William Hamilton (1964), Richard Alexander (1974, 1979), and Robert Trivers (1971,

1972, 1974). All of these scientists have argued that it should be possible to explain human social behavior within the framework of evolutionary theory.

My purpose was to set out and test a theory about political communities that would build directly upon evolutionary theory. In order to do this I had to demonstrate the points that are listed below.

1. A very basic point that I made in Chapter 1 was that Homo sapiens like other species is the product of evolutionary processes. This point was important because there would be little reason to ask questions about the relevance of evolutionary theory to politics if these processes had little or nothing to do with the traits of humans.

I pointed out that natural selection is the most important evolutionary process because of its role in producing directional changes in traits that enhance the ability of individuals to survive and reproduce. It is apparent that the traits of humans like those of other species exist because of their usefulness in combating the hostile forces of nature, including parasites, predators, diseases, food shortages, climate, and mate shortages.

Furthermore, it is apparent now that natural selection is generally effective at a level no higher than the individual. This means that the traits of humans must be studied in terms of their effects on the survival and reproduction of individuals. There is good reason to think that theoretical approaches that assume that cultural traits exist for the benefit of entire societies are incorrect.

Approaches like this, such as systems theories, however, are very common in the social sciences.

2. In Chapter 2 I made the point that many of the unique and distinctively expressed traits of humans owe their existence to the prominence and constancy in human evolutionary history of intergroup competition and conflict, building upon a previously published argument by Alexander and Noonan (1979). We are the direct and indirect consequences of environmental conditions that favored warfare as the most effective strategy of competition with other conspecifics. The reasons for this are not entirely clear but probably involve the concatenation of environmental conditions in the evolutionary line that led to humans that favored group living for protection from predators and scavengers, bipedalism, the use of tools and weapons, cooperation in group hunting, and eventually cooperation against groups of hostile conspecifics.

In this regard, I showed how a number of human traits may be due (at least in part) to the direct effects of combat casualties in warfare. These included traits associated with sexual dimorphism, male neoteny, disabilities of various types, fear, courage, fore-sight, cooperativenss, non-cooperativeness, revenge, and aggressive/ submissive behaviors. All of these traits are of demonstrable signif-icance to politics. I also tried to show that many other traits of humans are due (at least in part) to the indirect effects of warfare upon the inclusive fitnesses of individuals. These included polygyny, patriotism, the immunological system, reciprocity, and parental care and female distinctiveness. If my arguments regarding the probable influence of warfare upon these traits are correct,

this would be further support for the notion that the practice of warfare in human cultural history has had profound effects upon human traits and by extension, politics.

I also made the point that it is impossible to explain something as unique as political communities without understanding what it is about humans that makes us different from other species. I argued that complex political communities differ from the groups characteristic of other species in several important respects: they are comprised of territorial levels or subdivisions that are structured hierarchically, and the territorial levels are comprised of unrelated individuals who all (potentially) reproduce. This type of social organization depends upon the capacity for individuals to recognize and know each other. Without this capacity, reciprocity, the glue that holds it together, would not exist. Alexander (1979) and Willhoite (1980) have also noted the pivotal importance of reciprocity in complex political communities.

3. In Chapter 3 I argued that the capacity for culture is a biological adaptation and like any other trait exists because it helps insulate individuals from the action of hostile environmental forces. It was necessary to make this point because of the widespread presumption by many social scientists that humans, because of their possession of culture, have somehow transcended their biology. If this were true, there would be little point in studying cultural phenomena like political communities using evolutionary theory.

I pointed out similarities and differences between processes of biological and cultural evolution. Some social scientists assume that evolutionary theory is irrelevant to explanations of political

change because such change occurs too fast to be propelled by natural selection. This perspective, however, draws too sharp of a dichotomy between biological and cultural change. Although not much is known about the relationships between these two types of change, it is apparent that such relationships exist and are extremely important. An example that I used from recent history was the great reproductive opportunities that accrued to individual Europeans who migrated to North America, South America, and Australia. The modern weapons and tactics of the Europeans enabled them to conquer native populations and displace them from their territories.

I looked at the relationship of warfare to processes of cultural evolution, especially selection and diffusion, and argued that warfare was among the most important causes of cultural change. This is particularly true in regard to cultural traits linked with politics since these are often selected as a unit whenever political communities are destroyed as a result of the failure of their military units to defend them. Many other cultural traits, however, are also affected by warfare, both directly as a consequence of the destruction of warfare and indirectly as a consequence of warfare's effects on the survival and reproduction of individuals who are the carriers of cultural traits. In support of this argument I pointed out how the cultural traits of militarily successful political communities, such as the United States, have spread and increased in frequency.

4. In Chapter 4 I made the point that it is possible to understand the cultural practice of warfare within the framework of evolutionary theory. In order to do this I needed to show that

there are benefits to individuals from war that compensate or exceed
its costs. Although this is difficult to do directly, the data from
my sample societies did indicate that individuals, especially those
engaging in military actions, have derived benefits from their parti-
cipation.

The most common reason for war in the sample societies was
defense. Political communities that engage in war for this reason
deter enemy attacks and minimize damage and losses suffered to
their population, property, and territory. It is somewhat easier for
political communities to obtain the cooperation of their members
in defensive effort than in other types of activities because of
the transparent benefits that individuals derive from activities that
protect themselves and their families.

The second most common reasons for war were economic. Among
these the most common were captives, plunder such as cattle, and
the capture of women for use as concubines/wives. All of these,
especially the last two, are linked with resources relevant to
survival and reproduction. Less common but more advanced reasons
for war including prestige and political reasons seem to depend
upon the prior existence of benefits that are more directly relevant
to inclusive fitness. This suggests that warfare, at least during
some period of human evolutionary history, has enhanced the inclusive
fitnesses of the individuals who engaged in it.

These findings about the reasons that political communities go
to war replicate those of an earlier study by Otterbein (1970) and
reinforce them. However, they contradict the argument of some
social scientists that warfare is only a recent historical invention

and because of its novelty a pathological aberration.

Additional evidence on the nature of intergroup competition in species closely related to humans, especially the chimpanzee, reinforce this point. It is difficult to see how we could assume that warfare has always been "maladaptive" if intergroup conflict is a prominent trait in a species that is closely related to us. The revulsion that we might hold of a cultural practice such as warfare should not prejudice an analysis of its origins and causes.

Although warfare is a very prominent cultural trait, it is not universal. There have been some societies (although evidently not very successful) that have not practiced it. The environmental conditions that encourage warfare as a strategy of competition with hostile conspecifics, however, must be very widespread. That warfare is not universal is sufficient evidence to reject the notion that humans are somehow genetically programmed for it however nonsensical this idea is on other grounds. Warfare is a cultural trait. It is a social behavior and like all behavior is a consequence of the interaction of genetic materials with the environment.

5. In Chapter 5 I made the point that the use of military practices has very important consequences for political communities. In the first instance, the relative effectivenss of military practices used by a political community affect its ability to defend itself and ultimately its prospects of survival. Some of the most important military practices in this regard were defensive and offensive sovereignty, shock weapons, tactical systems, the composition of military units, the size of military units, and reasons for engaging in war.

In the second instance, the use of effective military practices
is facilitated by the existence of political communities with partic-
ular structural characteristics. The recruitment of large military
units, for example, is possible only if there is a large political
community with the capacity to equip, train, and support such units.
It is reasonable to suppose that many of the characteristics of the
complex political communities that exist today are due to their use
of relatively effective military practices. They are the survivors.

6. A critical test of the intergroup competition and conflict
hypothesis is whether or not political communities exist for the
purpose of defense. If they exist for some other purpose, as
evidenced by their characteristics, the hypothesis would be false.
In Chapter 6, to test this hypothesis about defense, I measured
several structural characteristics of the political communities of
my sample -- centralization and polarity.

Centralization is a measure of the structural complexity of
political communities. I looked at two aspects of centralization --
the number of territorial levels or subdivisions and the degree of
concentration of sovereignty at the highest territorial level.
Polarity is a measure of the extent to which sovereignty is held by
a single individual and/or group and is similar to the familiar
concept of power.

In support of my argument, I showed that the degree of central-
ization of political communities was positively correlated with
their success in warfare as measured by changes in territory/autonomy.
A major reason for this success is that centralized political commun-
ities have structural characteristics that facilitate the coordination of

military activities, especially defensive effort.

I also argued, based on limited data, that the direct cause of increasing political centralization in political communities is almost always warfare (although warfare does not always have this effect). In some of my sample societies warfare resulted in the fusing of simple political communities for the apparent purpose of improving defenses. In other societies, warfare led to fusing by conquest. These political communities grew in population and territory. This led to administrative problems (especially those linked with defensive problems in the context of balance of power races) that were only solved by the addition of territorial or subdivisional levels.

Polarity is also an important structural characteristic of political communities. Its significance is in part its importance to warfare. There is a strategic advantage if sovereignty in military activities, especially in defense, is held by a single individual. Although the data from my sample supported the hypothesis that polarity affects the ability of political communities to defend themselves, as measured by changes in territory/autonomy, the relationship was not statistically significant.

The data from my sample societies on the incidence and location of sovereignty showed clearly that political structure is in large measure a consequence of defensive problems. Sovereignty in external defensive warfare was almost always located at the highest territorial level. The few societies in which this was not true had political communities that were vestigial and therefore decadent (Dorobo), had ones that were isolated and therefore did not engage in warfare (Manihikians), or lacked political communities entirely (Selung).

Sovereignty in external defensive warfare was almost always located at as high a territorial level as sovereignty in any other political activity, or higher. The few societies in which this was not true like the Jemez were not fully autonomous and were subject in some ways to the authority of a colonial power. It was apparent that such conditions were unstable and therefore transitional.

The incidence of sovereignty was less in non-military than in military activities. Among non-military activities, however, sovereignty was more common in activities with a presumptive linkage to defensive problems such as judicial/arbitration activities and the collection of taxes, tribute, and labor services than in activities without this linkage such as rule making/legislative and religious activities. This suggests that sovereignty is extended from military activities into non-military ones because of their linkages.

These results on the incidence and location of sovereignty within political communities contradict alternative hypotheses about the function of political communities. Some hypotheses can be rejected. Political communities do not exist to prey upon other political communities, to increase economic productivity and social welfare, to settle disputes, to insure social tranquility, or to deal with the supernatural. Rather, they exist to defend us from groups of hostile conspecifics.

7. In Chapter 7 I pointed out that the benefit of protection from groups of hostile conspecifics that political communities afford is purchased at a cost. The major cost is intensified competition with individuals, kin groups, and other groups for reproductive resources such as mates, food, shelter, land, animals, and most

especially the economic, social, and political positions that facili-

tate disproportionate access to and control of such resources. I

argued that intensified competition has important effects upon politi-

cal communities including the extension of political sovereignty,

the growth of kinship based coalitions, social stratification,

intensified competition for political offices, and fissioning.

The causes of competition within political communities are linked

directly with the scarcity of reproductive resources and indirectly

with the economic, social, and political conditions that generate

scarcities. My analysis of disputes recorded in the ethnographic

literature suggests the more important reasons for social conflict

include various types of personal attacks such as assault and murder,

adultery and other disputes over women, and theft. It is apparent,

although hardly surprising, that the reasons for social conflict are

not trivial but involve important reproductive resources.

Competition between people for reproductive resources is promin-

ent in all political communities but is especially intense in cen-

tralized political communities because of higher population densities

and urbanization. As I showed in Chapter 7, these conditions encour-

age or compel political officials to extend sovereignty into new

activities -- especially those linked with social control such as

police and rule making/legislative activities. Political officials

seem to do this for several reasons.

One reason is that the survival of the political community

depends ultimately upon the ability of political officials to reduce

the costs to people of intensified competition. This competition

may endanger the political community by inhibiting defensive effort.

It may also lead to fissioning. Some political officials undoubtedly have more foresight than others and can see the dangers to their own position and to the survival of their political communities from intensified competition and can act to reduce it.

A second reason is that it is usually in the self-interest of political officials to extend sovereignty into activities that have the effect of reducing the costs of intensified competition. This is because the acquisition of sovereignty or power is associated with increased perquisites of political office which can be used for personal and family advantage.

Growth in the size and complexity of political communities is associated with the appearance of large kinship groups. These groups act as a basis of alliance for defense, as a resource holding unit, as a second line of defense for members in times of need, as a group that arranges marriages, and as a political group.

An analysis of the types of kinship groups that existed in the sample societies suggested that the origin of both patri-kin and matri-kin groups is tied to problems of warfare. Patri-kin groups seem to be a defensive response to warfare at close range, and matri-kin groups to warfare at long range. This analysis reinforces the intergroup competition and conflict hypothesis because it shows the profound effects that problems of external polity have upon social structure, including residency patterns, the economic role of the sexes, and marriages.

An analysis of the role of the family and larger kinship groups in disputes showed clearly the importance of these groups as a second

line of defense. Individuals sought blood relatives as allies three or four times more often than anyone else. This result was entirely consistent with Hamilton's theory of inclusive fitness and also reinforces Alexander's argument about the importance of reciprocity between relatives.

I also looked at the political involvement of kinship groups. My data showed that this involvement was greatest in political communities of intermediate complexity. I argued that large kinship groups, because of the nature of competition within political communities of intermediate complexity, are more effective in those political communities than in ones of lesser or greater complexity.

There is a major difference between the political communities in my sample and modern states. In my sample, the kinship group was quite often an effective basis of alliance for the acquisition and retention of political power. In modern states this is not true. This is because the kinship group, no matter how it is reckoned, is necessarily small. The larger the kinship group becomes the less cohesive the consanguineal and affinal ties. Furthermore, as generation succeeds generation, kinship ties become increasingly remote.

The types of groups that exist and are politically active in modern states, such as interest groups and political parties, are more effective than kinship groups because they are larger and because they are organized for specific purposes. The kinship group is less effective in modern states because it is small in relation to its competition and organized for a variety of purposes, one of which necessarily includes reproduction and the nurture of children.

The relative ineffectiveness of kinship groups in modern states is indicated by their inability to hold on to political offices in the face of serious challenges to their rule. The members of kinship groups are more interested in their viability as a reproductive unit than in political offices. If their lives are threatened by political challengers, as in coups and revolutions, they are likely to disintegrate as an effective political group and abandon their hold on political offices, fleeing with their lives and property. Some examples of this phenomenon are the Thieu family which fled South Vietnam and the Somoza family which fled Nicaragua.

The control of political communities by kinship groups has important consequences for their structure. The data from my sample showed a positive correlation between kinship group control and the degree of polarity that existed. This was in sharp contrast to the absence of any relationship in my sample between social stratification and polarity.

The principal form that political competition takes within political communities is competition for political offices. In the political communities of my sample this competition was predominantly between kin groups. The inclination of incumbent political officials is to solidify the basis of their political power. Important ways of doing this include relying upon the kinship group as a political resource and restricting succession in office to this group. The data that I collected on the order of succession to office support the notion that incumbent political officials establish rules of succession so that their successors are close relatives who can use the perquisites of office to enhance (the

incumbent's) inclusive fitness. I also showed that the substantial perquisites that accompany the highest offices of political commun-ites encourage the use of intimidation, physical force, and military action to obtain them.   .

The appearance of complex patterns of social stratification within political communities is an important issue because of its relevance to explanations of the characteristics of modern states. The data from my sample on the possible origins of stratification were ambiguous. The strongest correlation that existed was between social stratification and political centralization. Since I showed in Chapter 6 that the causes of political centralization are linked with warfare (and especially conquest) and defensive problems that accompany balance of power races, it seemed plausible to me that the origin of social stratification was linked with problems of external polity. Conquered populations, captives, and refugees were the sources of slaves, castes, and lower classes.

Intensified competition within political communities leads to fissioning and their breaking up into smaller and geographically separate ones. In some of the societies of my sample, fissioning led to devolution in the sense that the separate political communi-ties that resulted from fissioning had a smaller number of terri-torial levels or other less complex structural characteristics than the parent political community that fissioned.

My limited data on fissioning showed that it is encouraged when resources are geographically dispersed or when territory surrounding the political community is sparsely inhabited or weakly defended. These conditions were presumably those that prevailed for most of

cultural history when the number of political communities increased
due to fissioning, but not their average size.

Fissioning was discouraged under the opposite conditions -- when
resources were geographically concentrated or when territory surround-
ing the political community was densely inhabited and strongly defen-
ded. These conditions existed in some areas of the world (e.g.,
Mesopotamia) as long as 10,000 years ago. At present these conditions
prevail in practically all areas of the world. The existence of these
conditions, by discouraging fissioning, led to an increase in the
frequency of centralized political communities. Once these appeared,
they continued to exist because of the persistence of threats from
hostile political communities and because of their military advan-
tages.

The limited data that I collected suggested that a prominent
cause of fissioning is economic, social, and political exploitation.
This was a particularly common phenomenon in smaller, less centralized
political communities. Individuals (and kin groups), because of
disputes with other more powerful individuals (and kin groups), would
simply leave. In large, centralized political communities a promin-
ent cause of fissioning is contests for political offices and their
perquisites. These contests often occurred in connection with dynas-
tic disputes.

My overall findings regarding the impact of problems of internal
polity upon political communities mesh with and build upon the find-
ings regarding problems of external polity. The intensified competi-
tion for reproductive resources that goes on within political communi-
ties would not occur if it were not for the existence of hostile groups

of conspecifics. Otherwise, political communities would fission, and
the intensity of competition within them would diminish.

8. In Chapter 8 I made the point that there are important repro-
ductive resources attached to political offices and that these are
used by officials to enhance their own inclusive fitness. These resour-
ces include sexual and marital perquisites, the services of retainers,
prestige and nepotism, material perquisites, and special exemptions.
One of the most important benefits of political power, except in
the modern political communities that impose monogamy, is polygyny.
I was able to show a positive correlation between political power,
as indicated by polarity, and the degree of polygyny that existed
within political communities.

The absence of polygyny in most modern nation states suggests
that extreme asymmetries of reproductive potential within large
political communities are inherently unstable. Their existence always
results in a sense of relative deprivation and intensified political
opposition.

My findings regarding the means by which the highest political
officials support themselves and their retainers show that external
sources of support derived from warfare and imperialism were surpris-
ingly important in centralized political communities. An intriguing
question is raised as to whether the involvement of centralized politi-
cal communities in warfare is a force that engenders economic exploi-
tation within them. The existence of a credible external threat
and the military preparations that accompany it benefit individuals
with closer connections to military activities more than others.

These results on the perquisites of political offices show clearly that control of political communities is associated with important reproductive benefits. The efforts by individuals to acquire offices, to hold on to them, and to transmit them to their descendants is easily understood in terms of the struggle by individuals (and groups) for reproductive resources.

It should be plain that many of the points that I have demonstrated are not especially novel since they build upon the views and findings of many natural and social scientists. The theory in which they were encompassed, however, is a sharp departure from most other ideas that have prevailed about political systems in the social sciences.

The most important difference is that the theory presented here builds upon evolutionary theory. There is conscious consideration of the impact of hostile forces upon the non-cultural and cultural traits of humans. Other theories that have prevailed about political systems have generally ignored the significance of such systems to the inclusive fitnesses of humans. Another difference is that the theory presented here accounts for change to political systems, whereas previous theories have sometimes ignored change.

Another difference is that the theory presented here proposes a single major cause of the characteristics of complex political systems -- defensive problems as these result from conditions of external polity and warfare -- whereas previous ideas that have prevailed about political systems have proposed multiple causes or have been so unclear that the causal linkages between variables are difficult or impossible to decipher. A corollary of this difference is that many previous ideas about political systems have ignored either partially

or entirely causes that are external to a particular political system. The theory proposed here, on the other hand, provides a way of linking together the field of comparative politics, concerned about the structural characteristics of political systems, with international relations, concerned about relationships between political systems.

The theory presented here accounts for changes to political systems in both directions -- toward larger size and greater complexity and toward smaller size and lesser complexity. Change toward larger size and greater complexity (centralization) is a consequence of greater defensive problems; change toward smaller size and lesser complexity (decentralization) is a consequence of intensified competition within political communities and fissioning.

The theory presented here was treated as a basic proposition with a very large number of implications. A large number of these were tested. Data on the political communities of a world-wide sample of societies were generally consistent with the major hypotheses. Although results based upon a single sample must always be regarded as preliminary and tentative, they are nonetheless encouraging. A number of the results of this study including those regarding military activities and the causes of war replicated earlier findings by Otterbein (1970).

I would also argue that the theory proposed here, although it was tested using a sample of societies with political communities that are now mostly extinct, is still very relevant to an understanding of politics in the complex political communities that exist today. The following points illustrate how the theory proposed here might lead to a reevaluation of some puzzling phenomena of modern politics,

(1) The most significant point to be made, perhaps, is the primacy of military problems, especially those of defense, in political communities. Any analysis of the activities of contemporary nation states, of course, is unlikely to seriously challenge this view. One need only point to the prominence in international relations of warfare, the intensity of the arms race, the diffusion of weapons and high technology, the continuous shifts in balances of power, the open struggles for strategic resources such as petroleum, and the large proportions of governmental budgets spent on the military. What is lacking in much of current research, however, is analysis of how problems of external polity impact upon political activities and structures.

It would be interesting, in this regard, to analyze the defensive problems of modern nation states and correlate these with their structural characteristics. The absence of serious defensive problems should be associated with a lower degree of polarity; the presence of serious defensive problems should be associated with a higher degree of polarity.

Although comparative data are lacking, the hypothesis does seem to be plausible. Autonomous political communities which are vulnerable to invasion and conquest because of their geographical location seem to be more unipolar than other comparable political communities. Among the socialist countries, for example, the Soviet Union, China, North Korea, and North Vietnam, all of which have been threatened with invasion, seem more unipolar than the countries of Eastern Europe or the Marxist countries of Africa. Similarly, among the Western democracies, West Germany and France are more unipolar than countries like Australia, Canada, Great Britain, and the United States. It is

noteworthy that the direction of political change in Spain, a deviant case, is toward greater multipolarity. Spain is less directly threatened by invasion from the East than are West Germany and France.

(2) Another point to be made is that political evolution is a continuous process. Fusioning by conquest still occurs -- e.g., South Vietnam, Kampuchea, Afghanistan (?). Fissioning still occurs -- e.g., Pakistan. It would be interesting to know what factors will determine the rate at which these processes will continue in the future. For example, it seems that fusing is most likely to occur in regions of the world where states are both small and militarily weak such as in Africa, Central America, and the Middle East. It may also occur in regions of the world where states are small alone such as in Western Europe. Imbalances of military power would seem to be more likely to appear in such regions and more likely to lead to warfare and conquest.

(3) Another point to be made is that the characteristics of political communities are not self-generating. They depend on conditions of both external and internal polity. For example, it appears that "civic cultures" (a structural condition of multipolarity) are more likely to occur under conditions of relative geographical isolation and safety, as in the Australia, Canada, Great Britain, and the United States, and under conditions of economic prosperity. The research of Ronald Inglehart (1981) on political values in Western Europe and the United States shows that the absence of warfare and the existence of prosperity have resulted in a shift toward greater emphasis upon democratic "post-materialist" values.

(4) Another point to be made is that the survivability of different types of political communities depends upon their relative success in warfare. The process of cultural evolution is indifferent to the characteristics of political communities except insofar as these contribute to success in warfare. Thus, the existence of a strong economy, civil liberties, democratic institutions, and a variety of other characteristics must be analyzed in light of their impact upon survival capability. The fact that we might prefer particular characteristics over others may have no bearing upon the question of their survivability.

The strategic successes of communist states, such as North Vietnam and the Soviet Union, suggest that these political communities have characteristics that are militarily advantageous. Presumably, one of the most important of these is the ability of the political officials of these states to impose costs upon their citizens with relative impunity. Although most everyone in Western countries would find life in these political communities disgusting and intolerable, that may have little or no bearing on whether they are either more or less likely to survive than their democratic competitors.

(5) Perhaps the last point to be made is that political communities are the consequence of cultural evolution and exist because over much of cultural history they have promoted the survival and reproduction of their individual members. This may or may not be true today.

APPENDICES

APPENDIX A   LIST OF SOCIETIES

APPENDIX B   SOURCES OF SOCIETAL INFORMATION

APPENDIX C   SAMPLING AND METHODS

APPENDIX D   TABLE OF SOVEREIGNS

APPENDIX E   LIST OF OFFICIALS

APPENDIX A

LIST OF SOCIETIES

Sample Number	Society	Atlas Code	HRAF[a] Code
01.	Bunda	Ac21	
02.	Luvale	Ac11	
03.	Luguru	Ad14	
04.	Guro	Af51	
05.	Babwa	Ae7	
06.	Thonga	Ab4	FT6
07.	Dorobo	Aa2	FL6
08.	Nama	Aa3	FX13
09.	Gogo	Ad24	
10.	Kuba	Ac4	
11.	Falasha	Ca31	
12.	Lugbara	Ai32	
13.	Konso	Ca1	
14.	Iraqw	Ca4	
15.	Songhai	Cb3	
16.	Ahaggaren	Cc9	
17.	Jur	Ai36	
18.	Banyun	Ag16	
19.	Sara	Ai22	
20.	Dinka	Aj11	
21.	Iranians	Ea9	MA1
22.	Selung	Ej6	
23.	Siamese	Ej9	AO1
24.	Garo	Ei1	AR5
25.	Madan	Cj10	
26.	Okinawans	Ed7	AC7
27.	Chechen	Ci7	
28.	Mogh	Ei9	
29.	Gujarati	Ef9	AW7
30.	Baiga	Eg9	
31.	Purari	Ie8	
32.	Cebu (Sugbuhanon)	Ia12	OA1
33.	Aua	Ig13	
34.	Mailu	Ie21	
35.	Tongans	Ii12	OU9
36.	Sivokakmeit (St. Lawrence Eskimos)	Na11	
37.	Koita	Ie20	
38.	Manihikians	Ij4	
39.	Kapauku	Ie1	OJ29
40.	Tasmanians	Id8	OI19

[a] Human Relations Area Files Code

LIST OF SOCIETIES (continued)

Sample Number	Society	Atlas Code	HRAF Code
41.	San Juan Paiute	Nd56	
42.	Wukchumni	Nc25	NS29
43.	Wichita	Nf5	
44.	Bungi	Ne14	NG6
45.	Winnebago	Nf2	NP12
46.	Bohogue	Nd45	
47.	Lake Yokuts (Tachi)	Nc24	NS29
48.	Kiowa	Ne17	
49.	Atsugewi	Nc4	
50.	Northern Saulteaux	Na33	
51.	Jemez	Nh8	
52.	Inca	Sf1	SE13
53.	Tehuelche	Sg4	SH5
54.	Tewa	Nb11	NT18
55.	Aztec	Nj2	NU7
56.	Botocudo	Sj5	
57.	Zuni	Nh4	NT23
58.	Goajiro	Sb6	SC13
59.	Chichimeca	Ni5	
60.	Pima	Ni6	

APPENDIX B

SOURCES OF SOCIETAL INFORMATION

The following are the major sources of information on the sample societies. The societies are listed alphabetically for easy reference. Many of the listings were available in the Human Relations Area Files (HRAF). (See Appendix A for the HRAF code for those sample societies in the Files). Most of the other listings were available in the University of Michigan library. Other listings were obtained through inter-library loan.

The listings are accompanied by focal dates or periods indicating the dates or periods to which the data coded in this study pertain. Most of the listings are also accompanied by information on the professional qualifications of the ethnographer and the dates of his field work.

SOURCES OF SOCIETAL INFORMATION

Ahaggaren   to 1900

Benhazera, Maurice. 1908. Six Mois chez Touareg du Ahaggar.
    Alger: Typographie Adolphe Jourdan.
    (government official; 1905)

Lhote, Henri. 1944. Les Touaregs du Hoggar. Paris: Payot.
    (ethnologist: 1929-1940)

Nicolaisen, Johannes. 1959. Political systems of pastoral Tuareg
    in Air and Ahaggar. Folk 1:67-131.
    (ethnologist; 1951-1955)

_____. 1963. Ecology and culture of the pastoral Tuareg, with par-
    ticular reference to the Tuareg of Ahaggar and Ayr. National-
    mussets Skrifter, Etnografisk Raekke 9:67-131.
    (ethnologist; 1951-1955)

Atsugewi   ca. 1860

Garth, Thomas R. 1953. Atsugewi ethnography. Anthropological
    Records 14(#2):129-212.
    (anthropologist; 1938-1939, 3 months)

Voegelin, Erminie W. 1942. Culture element distributions: XX North-
    east California. Anthropological Records 7(#2):47-251.
    (anthropologist;

Aua   ca. 1903

Pitt-Rivers, George Lane Fox. 1925. Aua Island: ethnographical
    and sociological features of a South Sea pagan society.
    The Journal of the Royal Anthropological Institute of Great
    Britain and Ireland 55:425-438.
    (anthropologist;

Aztec   1422-1520

Bandelier, Adolph F. 1880. On the art of war and mode of warfare
    of the ancient Mexicans. Reports of the Peabody Museum of
    American Archaeology and Ethnology in Connection with
    Harvard University 2:95-161.
    (ethnologist; no date)

_____. 1880. On the distribution and tenure of lands, and the
    customs with respect to inheritance, among the ancient
    Mexicans. Reports of the Peabody Museum of American Archae-
    ology and Ethnology in Connection with Harvard University
    2:385-448.
    (ethnologist; no date)

Aztec (continued)

_____. 1880. On the social organization and mode of government
    of the ancient Mexicans. Reports of the Peabody Museum of
    American Archaeology and Ethnology in Connection with
    Harvard University 2:557-699.
    (ethnologist, no date)

Díaz, Bernal del Castillo. 1910 translation. translated and edited
    by Alfred Percival Maudslay. The True History of the Conquest
    of New Spain, Vol. II. Works Issued by the Hakluyt Society,
    (traveler, historian; 1519-1520)

Monzon, Arthur. 1949. El Calpulli en la Organizacion Social de
    los Tenocha (The Calpulli in the Social Organization of the
    Tenocha). Universidad Nacional Autonoma de Mexico, Publi-
    caciones del Instituto de Historia, No. 14. Mexico.
    (ethnographer, anthropologist; no date)

Sahagún, Fray Bernadino de. 1954 translation. translated from the
    Aztec by Arthur J.O. Anderson and Charles E. Dibble. Flor-
    entine Codex: General History of the Things of New Spain.
    Book 8--Kings and Lords. School of American Research, Mono-
    graph No. 14, Part IX. Sante Fe: The School of American
    Research and the University of Utah.
    (missionary; 1529-1590)

_____. 1955 translation. translated from the Aztec by Arthur J.O.
    Anderson and Charles E. Dibble. Florentine Codex: General
    History of the Things of New Spain. Book 12--The Conquest
    of Mexico. School of American Research, Monograph No. 14,
    Part XIII. Sante Fe: The School of American Research and
    the University of Utah.
    (missionary; 1529-1590)

_____. 1957 translation. translated from the Aztec by Charles
    E. Dibble and Arthur J.O. Anderson. Florentine Codex: Gen-
    eral History of the Things of New Spain. Book 4--The Sooth-
    Sayers, and Book 5--The Omens. Sante Fe: The School of
    American Research and the University of Utah.
    (missionary; 1529-1590).

Soustelle, Jacques. 1970 translation. translated from the French
    by Patrick O'Brian. Daily Life of the Aztecs on the Eve of
    the Spanish Conquest. Stanford, California: Stanford Univer-
    sity Press.
    (historian?; no date)

Vaillant, George Clapp. 1941. Aztecs of Mexico: Origin, Rise
    and Fall of the Aztec Nation. Garden City, New York:
    Doubleday, Doran & Company.
    (archaeologist; 1928-1936)

Babwa   1890-1905

   Halkin, Joseph. 1911. Les Ababua. Collection de Monographies Ethno-
        graphiques 7:1-616.
        (ethnographer; no date)

Baiga   ca. 1855

   Elwin, Verrier. 1939. The Baiga. John Murray· London.
        (ethnographer; 1932-1939)

Banyun   to 1900

   Bernatzik, Hugo Adolf. 1933. Aethiopen des Westens. Forschungsreisen
        in Portvgiesisch Gvinea. 2v. Wien: Verlag von L.W. Seidel & Sohn.

   Murdock, George P. 1958. African Cultural Summaries. unpublished man-
        uscript. New Haven, Connecticut: Human Relations Area Files.
        (anthropologist; no date)

Bohogue   1730-1878

   Murphy, Robert F. & Yolanda Murphy. 1960. Shoshone-Bannock subsist-
        ence and society. Anthropological Records 16(#7):293-338.

   Steward, Julian H. 1938. Basin-Plateau Aboriginal Sociopolitical
        Groups. Smithsonian Institution Bureau of American Ethnology
        Bulletin 120. Washington: U.S. Government Printing Office.
        (anthropologist; ?)

   _____. 1943. Culture element distributions: XXIII Northern and Gos-
        iute Shoshoni. Anthropological Records 8(#3):263-392.
        (anthropologist; ?)

Botocudo   ca. 1887

   Ehrenreich, Paul. 1887. Ueber die Botocudos der Brasilianischen
        Provinzen Espiritu Santo und Minas Geraes. Zeitschrift fur
        Ethnologie 19:1-82.

   Keane, A.H. 1883. On the Botocudos. Journal of the (Royal) Anthropo-
        logical Institute of Great Britain and Ireland 13:199-213.

   Manizer, Henri H. 1919. Les Botocudos d'apprès les observations
        recueillies pendant un séjour chez eux en 1915. Archivos do
        Museu Nacional. Rio de Janeiro 22:243-273.
        (ethnographer; 1915)

Bunda   ca. 1919

Torday, E. 1919. The Northern Babunda. Man 19(#4):49-55.

Weekx, G. 1937. La peuplade des Ambundu. Congo 18:i,353-373; ii, 13-35.
     (government officer;

Bungi   1800-1913

Skinner, Alanson. 1916. Political and ceremonial organization of the Plains-Ojibway. Anthropological Papers of the American Museum of Natural History 11:477-511.
     (anthropologist; 1913)

Cebu (Sugbuhanon)   1942-1945

Baclagon, Uldarico S. 1975. Military History of the Philippines. Manila: St. Mary's Publishing.
     (military officer; no date)

Briones, Concepsion G., ed. no date. City of Cebu; from Fishing Village to Metropolis. Cebu, Philippines: City of Cebu.
     (journalist and indigene; no date)

Lavilles, Gervasio L. 1965. Cebu: History of its Four Cities & Forty-Nine Municipalities. Cebu, Philippines: Mely Press.
     (lawyer-journalist, historian, guerrilla officer; no date)

Lieban, Richard W. 1967. Cebuano Sorcery; Malign Magic in the Philippines. Berkeley and Los Angeles: University of California Press.
     (?; 1958-1959, 1962-1963)

Malcolm, George A. 1936. The Commonwealth of the Philippines. New York: D. Appleton-Century.
     (judge; 1906-1936)

Chechen   1829-1859

Baddeley, John F. 1908. The Russian Conquest of the Caucasus. London: Longmans, Green and Co.
     (historian; no date)

Chichimec   1524-1590

Driver, Harold E. & Wilhelmine Driver. 1963. Ethnography and Acculturation of the Chichimeca-Jonas of Northeast Mexico. Bloomington, Indiana: Indiana University.
     (anthropologists; 1955-1956)

Dinka   1800-1927

Cummins, S.L. 1904. Sub-tribes of the Bahr-el Ghazal Dinka. Journal of The Royal Anthropological Institute 34:149-166.

Lienhardt, G. 1958. The Western Dinka. in J. Middleton and D. Tait, eds. Tribes Without Rulers. pp. 97-135. London: Routledge & Kegan Paul.
    (anthropologist; 1947-1951, 2 years)

Seligman, C.G. & Brenda Z. Seligman. 1932. Pagan Tribes of the Nilotic Sudan. pp. 135-205. London: George Routledge & Sons.
    (ethnologist; no date)

Stubbs, J.M. & C.G.T. Morrison. 1938. The Western Dinkas. Sudan Notes and Records 21:251-265.

Titherington, G.W. 1927. The Raik Dinka. Sudan Notes and Records 10:159-209.

Dorobo   1927-1938

Dundas, K.R. 1908. Notes on the origin and history of the Kikuyu and Dorobo tribes. Man 8(#76):136-139.
    (government official; ca. 1900)

Huntingford, G.W.B. 1942. The social organization of the Dorobo. African Studies 1:183-200.
    (ethnologist; 1927,1938-1939)

_____. 1951. The social institutions of the Dorobo. Anthropos 46:1-48.
    (ethnologist; 1927,1938-1939)

_____. 1953. The Dorobo of the North Tindiret Forest (Kipkurerek). in The Southern Nilo-Hamites. pp. 54-69. London: International African Institute.
    (ethnologist; 1927,1938-1939)

_____. 1954. The political organization of the Dorobo. Anthropos 49:123-148.
    (ethnologist; 1927,1938-1939)

Falasha   1314-1632

Flad, J.M.A. 1860. A Short Description of the Falashas and Kemants. Chrishona.
    (missionary; 1855)

Falasha (continued)

Hess, Robert L. 1969. Toward a history of the Falasha. in Daniel
F. McCall, Norman R. Bennett, & Jeffrey Butler, eds. Eastern
African History. pp. 107-132. New York: Praeger.
(historian; no date)

Leslau, Wolf. 1951. Falasha anthology. Yale Judaica Series 6:1-222.

Stern, Henry A. 1862. second edition 1968. Wanderings Among the
Falashas in Abyssinia. London: Frank Cass.
(missionary;

Garo   1800-1872

Burling, Robbins. 1963. Rengsanggri; Family and Kinship in a Garo
Village. Philadelphia: University of Pennsylvania Press.
(ethnologist; 1954-1956)   .

Choudhury, Bhupendranath. 1958. Some Cultural and Linguistic As-
pects of the Garos. Guahati, Assam: B.N. Dutta Barooah, B.L.
Lawyer's Book Sta..
(government official; no date)

Costa, Giulio. 1954. The Garo code of law. Anthropos 49:1041-1066.
(missionary; no date)

Hunter, William Wilson. 1879. Statistical account of the district
of the Garo Hills. in A Statistical Account of Assam, Vol.
2. pp. 133-170. London: Trubner & Co.
(administrator; no date)

Playfair, A. 1909. The Garos. London: David Nutt.
(colonial officer, Deputy Commissioner; ca. 1908)

Goajiro   1500-1941

Armstrong, John M. & Alfred Métraux. 1948. The Goajiro. in Julian
H. Steward, ed. Handbook of South American Indians 4:359-
383.
(ethnologists; no date)

Bolinder, Gustaf. 1957. Indians on Horseback. London: Dennis
Dobson.
(traveler; 1920s, 1930s, 1955)

Gutierrez de Pineda, Virginia. 1960. Social Organization in la
Guajira. (translated from the Spanish by Sydney Muirden).
New Haven: Human Relations Area Files. first published
as Organizacion Social en la Guajira. 1948. Revista del
Instituto Etnologico Nacional 3(#2). Bogotá.
(ethnologist; 1947)

Goajiro (continued)

Petrullo, Vincenzo. 1937. Composition of 'torts' in Guajiro
        society. Publications of The Philadelphia Anthropological
        Society 1:153-160.
        (ethnologist; 1935)

Pineda Giraldo, Roberto. 1950. Aspects of Magic in La Guajira.
        (translated from the Spanish by Sydney Muirden).
        New Haven: Human Relations Area Files. first published as
        Aspectos de la magía en la Guajira. 1947. Revista del
        Instituto Ethnologico Nacional, Vol. 3. Bogotá.
        (ethnologist; 1947)

Gogo   to 1911

Claus, Heinrich. 1911. Die Wagogo. Baessler-Archiv. Beiheft II
        1-8:1-72.
        (medical officer;

Paulssen, Franz. 1922. Rechtsanschauungen der Wagogo. Baessler-
        Archiv 5-6:161-175.

Schaegelen, R.P. Theobald. 1938. La tribu des Wagogo. Anthropos
        33:195-217,515-657.
        (evangelist, missionary;

Gujarati   1403-1600

Majmudar, M.R. 1965. Cultural History of Gujarat. Bombay:
        Popular Prakashan.
        (scholar; no date)

Pearson, M.N. 1976. Merchants and Rulers in Gujarat. Berkeley,
        California: University of California Press.
        (historian; no date)

Shah, P.G. 1964. Tribal Life in Gujarat. An Analytical Study of
        the Cultural Changes with Special Reference to the Dhanka
        Tribe. Sanshodhan Sadan, Bombay-52: Gujarat Research
        Society.

Guro   1906-1920

Murdock, George P. 1958. African Cultural Summaries. unpublished
        manuscript. New Haven, Connecticut: Human Relations Area
        Files.

Tauxier, L. 1924. Negres Gouro et Gagou. Paris: Librairie Orien-
        taliste Paul Geuthner.
        (colonial administrator; ca. 1914-1923)

Cieza de Leon, Pedro de. 1864. The Travels of Pedro de Cieza de
    Leon, A.D. 1532-50, contained in the First Part of his
    Chronicle of Peru. (translated and edited with notes and
    an introduction by Clements R. Markham). London: Works
    Issued by the Hakluyt Society, Second Series, No. 33)
    (soldier and government official; 1541-1550)

Cobo, Bernarbé. 1893. Historia del Nuevo Mundo (History of the
    New World). Vol. 4. (edited by Don Marcos Jiménez de la
    Espada). Sevilla: Sociedad de Bibliófilos Andaluces.
    (missionary; ca. 1610)

Garcilaso de la Vega, El Inca. 1869 & 1871. The Royal Commen-
    taries of the Yncas. Part I. (translated by Clements R.
    Markham). London. Hakluyt Society Publications, Series I,
    Vols. 41 and 45.
    (indigene; 1539-1560).

Polo de Ondegardo, Juan. 1873. Report by Polo de Ondegardo
    (translated and edited by Clements R. Markham). Narratives
    of the Rites and Laws of the Yncas. pp. 151-171. London:
    Hakluyt Society.
    (lawyer; ca. 1545)

_____. 1916. Informaciones Acerca de la Religión y Gobierno de
    los Incas (Information Concerning the Religion and Govern-
    ment of the Incas). Coleccion de Libros y Documentos Ref-
    erentes a la Historia del Puru, Vol. 3. Lima, Peru.
    (lawyer; ca. 1545)

Poma de Ayala, Felipe Guaman. 1936. El Primer Nueva Coronica
    I Buen Gobierno (The First New Chronicle and Good Govern-
    ment). Travaux et Memoires de l'Institut d'Ethnologie, Vol.
    23. Paris: Institut d'Ethnologie.
    (indigene; ca. 1613)

Rowe, John Howland. 1946. Inca culture at the time of the Spanish
    conquest. Bureau of American Ethnology Bulletin 143 2:183-330.
    (archaeologist; no date)

Xeres, Francisco de. 1872. A True Account of the Province of Cuz-
    co, Called New Castille, Conquered by Francisco Pizarro,
    Captain to His Majesty the Emperor, Our Master. (translated
    and edited by Clements R. Markham). Reports on the Discovery
    of Peru. pp. 1-74,94-109. London: Hakluyt Society.
    (traveler; 1531-1534)

Iran   1921-1980

Anonomous. 1953. Persia. in The Middle East, 3rd ed. pp. 239-263.
    London: Europa Publications Limited.

Atyeo, Henry C. 1954. Political developments in Iran 1951-1954.
    Middle Eastern Affairs 5:249-259.
    (historian; no date)

Cook, Nilla Cram. 1949. The theater and ballet arts of Iran. The
    Middle East Journal 3:406-420.
    (government censor; 1941-1948).

Elwell-Sutton, L.P. 1952. A Guide to Iranian Study. (compiled
    under the auspices of the Committee on Near Eastern
    Studies of the American Council of Learned Societies). Ann
    Arbor, Michigan: J.W. Edwards.
    (labor relations, press attache; until 1947)

Haas, William S. 1946. Iran. New York: Columbia University Press.
    (social scientist; 1935-1940)

Lambton, Ann K.S. 1953. Landlord and Peasant in Persia. London:
    Oxford University Press.
    (social scientist; 1936-1949)

Lenczowski, George. 1949. Russia and the West in Iran, 1918-1948.
    Ithaca, New York: Cornell University Press.

Massé, Henri. 1938. Croyances et Coutumes Persanes (Persian Be-
    liefs and Customs). Paris: Librairie Orientale et Américaine.
    (social scientist; ca. 1923)

Millspaugh, Arthur C. 1946. Americans in Persia. Washington, D.C.:
    The Brookings Institution.
    (government financial official; 1922-1927,1943-1945)

Newsweek. 1980. October 6,20,27 issues.

Roosevelt, Archie Jr. 1947. The Kurdish Republic of Mahabad. The
    Middle East Journal 1:247-269.
    (assistant military attaché; 1946-1947)

Shwadran, Benjamin. 1954. The Ango-Iranian oil dispute. Middle
    Eastern Affairs 5:193-231.
    (social scientist; 1948-1953)

Suratgar, Olive. 1951. I Sing in the Wilderness. London: Edward
    Stanford Limited.
    (foreign resident; 1936-1951)

Iran (continued)

Time. 1980. October 6,27 issues.

Wilson, Arnold T. 1932. Persia. London: Ernest Benn Limited.
     (British army officer, British consul, Anglo-American Oil
     Company; 1907-1914,1918-1932)

Iraqw   1770-1850

Bagshawe, F.J. 1924-1926. The peoples of the happy valley. Journal
     of the African Society 24:59-74.

Huntingford, G.W.B. 1953. The Southern Nilo-Hamites. pp. 127-
     146. London: International African Institute)
     (ethnologist; no date)

Winter, E.H. 1955. Some aspects of political organization and
     land tenure among the Iraqw. Arusha, Tanganyika (Kampala,
     Uganda): Government of Tanganyika (East African Institute
     of Social Research)

Winter, E.H. & L. Molyneaux. 1963. Population problems and
     patterns among the Iraqw. Ethnology 2:490-505.

Jemez   1600-1700

Bandelier, A.F. 1890. reprint edition 1976. Final Report of
     Investigations among the Indians of the Southwestern United
     States, Carried on Mainly in the Years from 1880 to 1885.
     Part I. New York: AMS Press.
     (ethnologist; 1880-1885)

_____. 1892. reprint edition 1976. Final Report of Investiga-
     tions among the Indians of the Southwestern United States,
     Carried on Mainly in the Years from 1880 to 1885. Part II.
     New York: AMS Press.
     (ethnologist; 1880-1885)

Ellis, Florence Hawley. 1951. Patterns of aggression and the
     war cult in Southwestern pueblos. Southwestern Journal of
     Anthropology 7(#1):177-201.
     (anthropologist;

Hawley, F.H. 1964. A reconstruction of the basic Jemez pattern
     of social organization. University of New Mexico Publica-
     tions in Anthropology 11:1-69.
     (anthropologist;

Jur ca. 1869

Butt, Audrey. 1952. The Nilotes of the Anglo-Egyptian Sudan and
Uganda. pp. 165-174. London: International African Insti-
tute.
(ethnologist?; no date)

Crazzolara, J.P. 1954. Lwoo Clans. Verona: Missioni Africane.
(missionary;

Ghawi, Jad Boutros. 1924. Notes on the law and custom of the Jur
tribe in the Central District of the Bahr El Ghazal Prov-
ince. Sudan Notes and Records 7:ii,71-81.
(Sudan Civil Service; ca. 1924?)

Petermann, A. 1941. Letters from Th.V. Heuglin to Dr. Petermann,
(July, 1862 to January, 1863). Sudan Notes and Records 24:
145-179.
(traveller; ca. 1862-1863)

Petherick, J. & Mrs. 1869. Travels in Central Africa. 2 Vols.
London: Tinsley Brothers.
(mining engineer, ivory trader, consul for Central Africa;
1861-1863)

Kapauku 1955-1963

Pospisil, Leopold. 1958. Kapauku Papuans and Their Law. Yale
University Publications in Anthropology 54:1-294.
(anthropologist; 1955-1963, various periods)

_____. 1963. The Kapauku Papuans of West New Guinea. New York:
Holt, Rinehart and Winston.
(anthropologist; 1955-1963, various periods)

Kiowa 1765-1874

Mishkin, Bernard. 1940. 2nd printing 1966. Ranks and Warfare
Among the Plains Indians. Seattle and London: University
of Washington Press.
(anthropologist, ethnologist; 1935)

Mooney, James. 1898. Calendar History of the Kiowa Indians.
Seventeenth Annual Report of the Bureau of American
Ethnology, 1895-1896, Part I 17:130-444.
(ethnologist; ca. 1898?)

Richardson, Jane. 1940. Law and Status among the Kiowa Indians.
New York: J.J. Augustin Publisher.
(anthropologist, ethnologist; 1935)

Koita   ca. 1904

Seligmann, Charles Gabriel. 1910. The Koita. in <u>The Melanesians of</u>
     <u>British New Guinea</u>. pp. 41-193. Cambridge: University Press.
     (anthropologist; 1904)

Konso   to 1936

Hallpike, C.R. 1970. Konso agriculture. <u>Journal of Ethiopian</u>
     <u>Studies</u> 8(#1):31-43.

Jensen, Ad.E. 1936. <u>Im Lande des Gada</u>. Stuttgart: Verlag Strecker
     und Schroder.

Kuba   1600-1900

Vansina, J. 1954. Les tribus Ba-Kuba et les peuplades apparentees.
     <u>Annales du Musee Royal du Congo Belge</u>. <u>Sciences de L'homme</u>
     <u>Monographies Ethnographiques</u> 1:1-64.
     (ethnographer; no date)

_____. 1978. <u>The Children of Woot; A History of the Kuba Peoples</u>.
     Madison, Wisconsin: The University of Wisconsin Press.
     (ethnographer; ca. 1956)

Lugbara   to 1925

Baxter, P.T.W. & Audrey Butt. 1953. <u>The Azande, and Related Peoples</u>
     <u>of the Anglo-Egyptian Sudan and Belgian Congo</u>. pp. 120-125.

Middleton, John. 1958. The political systems of the Lugbara of the
     Nile-Congo divide. in John Middleton & David Tait, eds. <u>Tribes</u>
     <u>Without Rulers</u>. pp. 203-229. London: Routledge & Kegan Paul.

Luguru   ca. 1850

Beidelman, T.O. 1967. <u>The Matrilineal Peoples of Eastern Tanzania</u>.
     London: International African Institute.

Scheerder & Tastevin. 1950. Les wa lu Guru. <u>Anthropos</u> 45:241-286.

Young, Roland A. & Henry Fosbrooke. 1960. <u>Land and Politics</u>
     <u>among the Luguru of Tanganyika</u>. London: Routledge, Kegan
     Paul.
     (social scientists; ca. 1955)

Luvale   to 1907

White, C.M.N. 1955. Factors in the social organization of the
     Luvale. African Studies 14(#3):97-112.
     (district officer;

_____. 1957. Clan, chiefship, and slavery in Luvale political
     organization. Africa 27(#1):59-76.
     (district officer;

Madan   1760-1924

Salim, S.M. 1962. Marsh Dwellers of the Euphrates Delta. London
     School of Economics Monographs on Social Anthropology 23:
     1-157.
     (anthropologist; 1953)

Thesiger, Wilfred. 1964. The Marsh Arabs. London: Longmans, Green
     and Co. LTD.
     (foreign resident; 1951-1958)

Mailu   ca. 1900

Malinowski, B. 1915. The natives of Mailu: preliminary results
     of the Robert Mond research work in British New Guinea.
     Transactions and Proceedings of the Royal Society of South
     Australia 39:494-706.
     (anthropologist; 1914-1915, six months)

Saville, W.J.V. 1926. In Unknown New Guinea. London: Seeley Ser-
     vice & Co.
     (missionary;

Manihikians   ca. 1906

Buck, Peter H. 1932. Ethnology of Manihiki and Rakahanga. Bernice
     P. Bishop Museum Bulletin 99:1-249.
     (ethnologist?; 1929, several days)

Mogh   1777-1898

Bessaignet, Pierre. 1958. Tribesmen of the Chittagong Hill
     Tracts. Asiatic Society of Pakistan Publications- No. 1.
     Dacca, Pakistan: Asiatic Society of Pakistan.
     (sociologist; 1957)

Hutchinson, R.H. Sneyd. 1909. Chittagong Hill Tracts. Eastern
     Bengal and Assam District Gazetteers. Allahabad: Pioneer
     Press.
     (Indian police;

Northern Saulteaux   1800-1900

   Hallowell, A. Irving. 1955. Culture and Experience. Philadelphia:
        University of Pennsylvania Press.
        (anthropologist; 1930s)

   Skinner, Alanson. 1911. Notes on the Eastern Cree and Northern
        Saulteaux. Anthropological Papers of the American Museum
        of Natural History Vol. IX, Part 1. New York: American
        Museum of Natural History.
        (anthropologist; 1909)

Nama   1800-1915

   Dapper, Olfert. 1933. translated by I. Schapera. Kaffraria or Land
        of the Kafirs, Also Named Hottentots. The Early Cape Hotten-
        tots. pp. 1-77,301-309. Cape Town: The Van Riebeeck Society.
        (humanist; no date)

   Grevenbroek, Johannes G. de. 1933. translated by B. Farrington.
        An Elegant and Accurate Account of the African Race Living
        Round the Cape of Good Hope Commonly Called Hottentots.
        pp. 158-309. Cape Town: The Van Riebeeck Society.
        (employee of Dutch East India Co., secretary of local
        Council of Policy; ca. 1694)

   Hoernle, A. Winifred. 1925. The social organization of the Nama
        Hottentots of South Africa. American Anthropologist 27(#1):
        1-24.
        (ethnologist; 1912-1913)

   Schapera, Isaac. 1930. The Khoisan Peoples of South Africa:
        Bushmen and Hottentots. London: George Routledge & Sons.
        (ethnologist; no date)

   Schultze, Leonhard. 1907. translated from the German for the
        Human Relations Area Files by Elizabeth C. Knight and
        Theodore Ziolkowski. Aus Namaland und Kalahari (In Nama-
        land and Kalahari). Gena: Gustav Fischer.
        (zoologist; 1903-1905)

   Vedder, H. 1928. The Nama. in The Native Tribes of South West
        Africa. pp. 107-152. Cape Town: Cape Times Ltd.
        (missionary; ca. 1910)

Okinawa   ca. 1400

   Kerr, George. 1911. Okinawa, The History of an Island People.
        Rutland, Vermont: C.E. Tuttle Co.
        (historian; no date)

Pima   1833-1864

   Drucker, Philip. 1941. Culture-element distributions: XVII Yuman-
        Piman. Anthropological Records 6(#3):91-230.
        (ethnologist, anthropologist; 1938)

   Russell, Frank. 1908. The Pima Indians. paper accompanying Twenty-
        Sixth Annual Report of the Bureau of American Ethnology.
        Washington, D.C.: Government Printing Office.
        (ethnologist;

Purari   1894-1914

   Holmes, J.H. 1924. In Primitive New Guinea. New York: G.P.
        Putnam's.
        (missionary;

   Maher, R.F. 1961. New Men of Papua. Madison, Wisconsin: Univer-
        sity of Wisconsin Press.
        (anthropologist; 1955)

   Williams, Francis Eager. 1924. Natives of the Purari Delta. Terr-
        itory of Papua Anthropological Report 5.
        (anthropologist; 1919-1920)

San Juan Paiute   to 1850

   Kelly, Isabel T. 1934. Southern Paiute bands. American Anthro-
        pologist 36:548-560.
        (anthropologist;

   Stewart, Omer C. 1942. Culture element distributions: XVIII Ute-
        Southern Paiute. Anthropological Records 6(#4):231-360.
        (anthropologist; 1937-1938)

Sara   ca. 1890

   Bruel, Georges. 1930. L'Afrique Équatoriale Française. Paris:
        Larose.
        (honorary colonial administrator; no date)

   Brunache, P. 1894. Le Centre de L'Afrique. pp. 205-259. Paris.
        (explorer, colonial administrator; ca. 1892-1894)

Selung   1828-1882

   White, Walter Grainge. 1922. The Sea Gypsies of Malaya. London:
        Seeley, Service & Co.
        (chaplain; 1908-1912?)

Siamese   1700-1800

Wales, Horace Geoffrey. 1934. Ancient Siamese Government and
     Administration. London: Bernard Quaritch.
     (historian; no date)

_____. 1952. Ancient South-East Asian Warfare. London: Bernard
     Quaritch.
     (historian; no date)

Wood, William Alfred Rae. 1926. A History of Siam. Bangkok.
     (consul-general, Chiengmai; no date)

Thompson, Virginia. 1941. Thailand the New Siam. New York:
     Macmillan.

Sivokakmeit (St. Lawrence Island Eskimos)   ca. 1880

Moore, Riley D. 1923. Social life of the eskimo of St. Lawrence
     Island. American Anthropologist 25:339-375.

Nelson, Edward William. 1899. The Eskimo about Bering Strait.
     Eighteenth Annual Report of the Bureau of American Ethnol-
     ogy, 1896-1897. Part 1. pp. 3-518.
     (naturalist, meterologist, ethnologist; 1877-1881)

Songhai   1493-1592

Cissoko, Sekene Mody. 1975. Tombouctou et L'Empire Songhay.
     Dakar, Abidjan: Les Nouvelles Editions Africaines.
     (historian; no date)

Hama, Boubou. 1968. Histoire des Songhay. Paris: Présence
     Africaine.
     (historian; no date)

Rouch, Jean. 1954. Les Songhay. Paris: Presses Universitaires
     de France.
     (ethnographer; 1941-1951)

Tachi (Lake Yokuts)   1840-1890

Gayton, A.H. 1930. Yokuts-Mono chiefs and shamans. University
     of California Publications in American Archaeology and
     Ethnology 24(#8):361-420.
     (ethnologist; 1925-1928)

Tachi (continued)

Kroeber, A.L. 1953. Handbook of the Indians of California.
　　Berkeley, California: California Book Company.
　　(anthropologist; ca. 1918)

Tasmanians　　　　　　　　　1803-1830

Roth, H. Ling. 1890. The Aborigines of Tasmania. London:
　　Kegan Paul, Trench, Trubner and Company.
　　(ethnologist; no date)

Tehuelche　　　　　　　　　ca. 1870

Cooper, John M. 1946. Patagonian and Pampean hunters. Hand-
　　book of South American Indians, Bureau of American
　　Ethnology Bulletin 1(#143):127-168.
　　(ethnologist; no date)

De Viendma, Antonio. 1837. Descripcion de la costa meridional
　　del sur, llamada vulgarmente Patagonica (Description of
　　the southern shores of that region commonly called Pata-
　　gonia). Coleccion de Obras y Documentos Relativos a la
　　Historia Antigua y Moderna de las Provincias del Rio de la
　　Plata. Pedro De Angelis, ed. 2, pp. 63-81. Buenos Aires:
　　Imprenta del Estado.
　　(colonial administrator; 1780-1784)

Musters, George C. 1873. At Home with the Patagonians. London:
　　John Murray.
　　(traveller; 1869-1870)

Tewa　　　　　　　　　　ca. 1926

Parsons, Elsie Worthington (Clews). 1929. The Social Organiza-
　　tion of the Tewa of New Mexico. Menasha, Wisconsin: The
　　American Anthropological Association.
　　(anthropologist;

Whitman, W. 1947. The pueblo Indians of San Ildefonso. Columbia
　　University Contributions to Anthropology 34:1-64.
　　(anthropologist;

Thonga　　　　　　　　　ca. 1890

Junod, Henri A. 1927. The Life of a South African Tribe. 2v.
　　London: Macmillan and Company.
　　(missionary; 1895-1909)

Anderson, William. 1967 edition. A journal of a voyage made in
    His Majesty's sloop Resolution May 16th 1777 in James Cook,
    The Journals of Captain James Cook on his Voyages of Discov-
    ery. edited from the original manuscripts by J.C. Beaglehole.
    Volume III. The Voyage of the Resolution and Discovery 1776-
    1780. Part II. Hakluyt Society, Extra Series, 36, part 2.
    Cambridge: published for the Hakluyt Society at the Univer-
    sity Press.
    (physician, explorer; 1777)

Collocott, Ernest Edgar Vyvyan. 1923. Marriage in Tonga.
    Polynesian Society, Journal 32:221-228.
    (missionary; no date)

_____. 1924. An experiment in Tongan history. Polynesian Society,
    Journal 33:166-184.
    (missionary; no date)

Cook, James. 1967 edition. The Journals of Captain James Cook on
    His Voyages of Discovery. edited from the original manuscripts
    by J.C. Beaglehole. Volume III. The Voyage of the Resolution
    and Discovery 1776-1780. Part I. Hakluyt Society, Extra
    Series, 36. Cambridge: published for the Hakluyt Society
    at the University Press.
    (government official, explorer; 1777)

Gifford, Edward Winslow. 1929. Tongan Society. Bernice P. Bishop
    Museum Bulletin 61. Bayard Dominick Expedition Publication
    Number 16. Honolulu, Hawaii: published by the Museum.
    (ethnologist; 1920-1921, 9 months)

Koch, Gerd. 1955. Sudsee--Gestern und Heute. Die Kulturwandel bei
    den Tonganern und der Versuch einer Deutung dieser Entwick-
    lung (The South Seas--Yesterday and Today. Culture Change
    among the Tongans and an Attempt to Interpret this Develop-
    ment).   translated from the German for the Human Relations
    Area Files by Frieda Schutze. Kulturgeschichtliche Forschun-
    gen, 7. Braunschweig: Albert Limbach Verlag.
    (ethnologist; 1951-1952, 9 months)

Mariner, William. 1818 second edition. An Account of the Natives
    of the Tonga Islands in the South Pacific Ocean. compiled
    and arranged by John Martin, M.D. Vol. 1 & Vol. 2. London:
    John Murray.
    (traveller; ca. 1777)

Tonga (continued)

> Vason, George. 1810 edition. An Authentic Narrative of Four Years'
> Residence at Tongataboo, One of the Friendly Islands, in the
> South Sea, by _____ Who Went Thither in the Duff, under
> Captain Wilson, in 1796. with an appendix, by an eminent
> writer. London: printed for Longman, Hurst, Rees, and Orme,
> L.B. Seeley, and Hatchard.
> (apostate missionary; 1797-1801)

Wichita   ca. 1860

> Dorsey, George A. 1904. The Mythology of the Wichita. Washing-
> ton, D.C.: Carnegie Institution of Washington.
> (anthropologist; 1900-1902, various periods)

> Schmitt, Karl & Iva Osanai Schmitt. 1953. Wichita Kinship Past
> and Present. Norman, Oklahoma: University Book Exchange.
> (anthropologists; 1947-1950, various periods)

Winnebago   1600-1900

> Lawson, Publius V. 1907. The Winnebago tribe. Wisconsin Archae-
> ologist 6(#3):77-161.
> (historian; no date)

> Radin, Paul. 1915-1916. printed 1923. The Winnebago tribe. Thirty-
> Seventh Annual Report of the Bureau of American Ethnology
> 37:36-560.
> (ethnologist; 1908-1913)

Wukchumni   ca. 1860

> Driver, Harold E. 1937. Culture element distributions: VI Southern
> Sierra Nevada. Anthropological Records 1(#2):53-154.

> Gayton, A.H. 1930. Yokuts-Mono chiefs and shamans. University of
> California Publications in American Archaeology and Ethnol-
> ogy 24(#8):361-420.
> (ethnologist; 1925-1928)

> _____. 1948. Yokuts and Western Mono ethnography. I. Tulare Lake,
> Southern Valley, and Central Foothill Yokuts. Anthropologi-
> cal Records 10(#1):55-132.
> (ethnologist; 1925-1930)

Zuni   1500-1900

Bandelier, A.F. 1890. reprint edition 1976. <u>Final Report of
      Investigations among the Indians of the Southwestern United
      States, Carried on Mainly in the Years from 1880 to 1885.</u>
      Part I. New York: AMS Press.
      (ethnologist; 1880-1885)

_____. 1892. reprint edition 1976. <u>Final Report of Investigations
      among the Indians of the Southwestern United States, Carried
      on Mainly in the Years 1880 to 1885.</u> Part II. New York:
      AMS Press.
      (ethnologist; 1880-1885)

Cushing, Frank Hamilton. 1896. <u>Outlines of Zuni Creation Myths.</u>
      Annual Report of the Bureau of Ethnology, <u>1891-'92.</u> Washing-
      ton: Government Printing Office.
      (ethnologist; 1879-1881)

Gifford, E.W. 1940. Culture element distributions: XII Apache-Pueblo.
      <u>Anthropological Records</u> 4(#1):1-207.
      (ethnologist; 1935)

Smith, W. & J.M. Roberts. 1954. Zuni law. <u>Papers of the Peabody
      Museum of American Archaeology and Ethnology. Harvard
      University</u> 43:1-175.

Stevenson, M.C. 1904. The Zuni Indians. <u>Annual Report of the
      Bureau of American Ethnology</u> 23:233-608.

APPENDIX C

SAMPLING AND METHODS

Sampling

Sampling Universe. A sample of 60 societies was drawn from the summary version of the Ethnographic Atlas (Murdock, 1967). This is a large sampling universe that contains 863 societies. The societies that are included within this universe are those which George Murdock judged to contain adequate ethnographic information based upon his personal search of the ethnographic literature of more than seven languages. The coverage of societies was virtually complete for all regions of the world except East Eurasia and the Insular Pacific (Murdock, 1967:1,2). In these regions the sampling universe is partially deficient because it does not contain all of the societies that have been adequately described. In spite of this problem, samples drawn from the summary version of the Ethnographic Atlas will generally be equal to or better than samples drawn from other sampling universes or preselected samples in terms of representativeness, focus, quality, and availability of codings (Otterbein, 1976: 109).

Stratification. This sampling universe of 863 societies was subdivided into six strata of equal size (although one strata, that for societies numbered 721 through 863, contained 143 rather than 144 societies). Ten societies were chosen at random, without replacement, from each of these six strata (i.e., when the case number of a society was drawn more than once, it was disregarded, so that no society would appear more than once in the sample).

For this sampling universe, there are some minor advantages to stratification over simple random sampling. The effect of stratification is generally to increase the variance on the strata variable. In this case the strata variable is case number, which because of the order in which societies appear in the sampling universe, is associated with region. There are good reasons to think that warfare is an important cause of cultural diffusion -- for that reason, a wider range of phenomena are likely to be represented in a sample of societies that are more dispersed geographically, as a consequence of stratification, than in a sample drawn by simple random sampling.

Since the strata are of equal size there is only a negligible difference between the statistics applicable to this sample, a proportional stratified sample, and statistics applicable to a simple random sample (Otterbein, 1976:118). For this reason, for reason of convenience, and because their use will not prejudice any tests of hypotheses, the statistics that are reported are those applicable to simple random samples.

Focal Dates. A major problem that is encountered in the study of cultural activities such as warfare is the specification of a focal date or period. Much of anthropological and ethnographic information with regard to warfare was not collected by first hand observation, or even second hand from the reports of participants, but rather by methods such as historical ethnography, where individuals who were alive during a period and may have learned about activities from others are asked to recall events as they remembered them. Other information on warfare is of archaeological or historical origin. For this reason, the focal dates of the summary version of

the Ethnographic Atlas, since they often correspond to dates at a time after significant Western contact and pacification, are not especially interesting or useful from the viewpoint of testing hypotheses about warfare. It was necessary, therefore, to set out some other criteria for selecting focal dates, and to select criteria that would be as unbiased as possible. The following criteria were set out:

1. For autonomous societies (i.e., societies in which political communities are able to engage in warfare freely) in which useable information on the topic of warfare or its absence was available for the focal date in the summary version of the Ethnographic Atlas and that date alone, that focal date and the period around it were selected (societies: Atsugewi, Aua, Bohogue, Botocudo, Bunda, Bungi, Chichimeca, Dinka, Kapauku, Kiowa, Koita, Manihiki, Mogh, Northern Saulteaux, Nama, Pima, Purari, Sara, Tachi, Tasmanians, Tehuelche, Wichita, Winnebago, Wukchumni).

2. For any society where useable information on the topic of warfare was available, but for a single focal date or period preceding the focal date in the summary version of the Ethnographic Atlas, that focal date or period was selected. Note: In most cases these were societies with political communities that had lost their autonomy to a Western colonial power but had engaged in warfare prior to the focal date in the summary version of the Ethnographic Atlas (societies: Ahaggaren, Aztec, Baiga, Babwa, Banyun, Cebuans, Dorobo, Garo, Goajiro, Gogo, Guro, Inca, Iraqw, Jemez, Jur, Konso, Lugbara, Luguru, Luvale, Madan, Mailu, San Juan Paiute, Selung, St. Lawrence Eskimos, Thonga, Zuni).

3. For any society where useable information of any sort

pertained to only a single focal date or period, that focal date or

period was selected (societies: Chechen, Kuba, Tewa).

4. For any society where useable information on the topic of war-

fare was available and such information was of considerable historical

depth (i.e., there were two or more distinct periods), the periods

for which information was available were identified. A single period

was then chosen randomly either by coin flip, if the periods were of

equal interval, or by selecting numbers from a table of random numbers

until a number corresponded to a date included within one of the per-

iods for which information was available (societies: Falasha,

Gujarati, Iran, Okinawa, Siamese, Songhai, Tonga).

Sampling Units. The basic sampling unit of the summary

version of the Ethnographic Atlas is the society. Although no precise

definition is given by Murdock, a society would correspond to a group

of people with a distinctive culture. A society, therefore, is a

"cultural unit." The most frequently used criteria for distinguish-

ing one society from another are ethnic and linguistic differences.

The causes of these differences is presumably related to various geo-

graphical or social barriers to interbreeding and cultural diffusion.

It is important to note that the summary version of the Ethno-

graphic Atlas is a sampling universe of societies and not political

communities. The societies of the Ethnographic Atlas each have

different numbers of political communities within them. Typically,

only one or several of these political communities were actually

studied. It is impossible to arrive at a sampling universe of

political communities because in many societies these political

communities have not been identified or counted. It is also

impossible to determine whether the political community (or communities) that was actually studied represented a random selection of the political communities of the society being studied. For these reasons, the weighting of political communities according to the number that exist in a society is inappropriate.

In some respects, however, this is less of a problem than it might seem. For many societies the information that anthropologists and ethnologists gather comes from just a single or at most a few political communities. It is apparent based upon brief obervation of a few other political communities, reports about other political communities, or other ethnographies that most if not all other political communities in the society have similar characteristics. The data that are collected from one political community, therefore, are probably similar to the data that would be collected from others.

In a number of societies, however, data are available on a variety of political communities and it is apparent that these political communities have different characteristics. If such a society was encountered, a number of rules were used to code information:

1. If information on political communities varied in quality, that political community was selected for which information was judged to be most adequate (societies: Kuba -- Bushoong state; Madan -- Beni Isad; Tewa -- San Ildefonso).

2. If information on political communities was about the same quality, a random selection was made (societies: Guro -- Southern Guro; Lake Yokuts -- Tachi).

3. If fragmentary information existed on a number of political

communities, information was coded so as to pertain to political

communities with the most complex structural characteristics (i.e.,

the most number of territorial levels). For example, if a society

included both petty chiefdoms and paramount chiefdoms, information

for the paramount chiefdoms was coded (societies: Ahaggaren, Gogo,

Kapauku, Nama, Okinawa, Thonga, Tongans). I did this to insure that

complex structural characteristics, if they existed within the

political communities of a society, were recorded to exist.

Coding

Coding Instrument. The coding instrument as indicated in

Chapter 1, contained four different sections. I tested the initial

version of the coding instrument on several societies selected at

random from the Human Relations Area Files. I found it necessary to

make some modifications to the initial instrument -- in particular,

for some items, such as the item on sovereignty in judicial/arbitra-

tion activities, new codes were added. I also added additional items

on the nature and effects of modern contact.

As in most cross-cultural studies, some difficulties were

encountered in coding. Most of these are attributable to the

nature of ethnographic information -- its lack of coverage, ambiguity

in the use of terms, and occasional inconsistencies in ethnographic

accounts.

Missing Data. Data on a substantial number of items were

inadequate for statistical analysis. There were a total of 374

items on the coding instrument (for the first three sections on

societal information). Of these items, there were 14 on which

data were available for less than 15 societies, 36 items on which
there was little variation (i.e., all but 5 or fewer cases were coded
on a single non-missing category), and 37 items on which both of
these conditions existed. For another 66 items, the presence of a
cultural trait or practice was noted in the ethnographic literature,
but not its absence. For some of these traits, for purposes of sta-
tistical analysis, I assumed that the trait was absent if it was
not indicated to be present.

Inferential Data. For some of the items it was possible to
infer codings for societies using indirect information. For example,
in societies that lacked horses or camels, it could be inferred
that cavalry was absent. Inferential data were marked on the coding
instrument by parentheses around the appropriate code. Notes were
taken to indicate the basis of the inference.

Foreign Language Materials. Materials in French were
coded either by myself or by Fred Zimmerman, one of my research
assistants. Materials in German were coded jointly by myself and a
German translator, Rob Bloomer.

Reliability. The reliability of the codings depends on
a number of factors. The first factor is the accuracy of the
original ethnographic accounts. If these accounts are in error,
my codings will reflect this. Although ethnographic accounts vary
widely in quality, sources in the summary version of the Ethnographic
Atlas are generally very good. Appendix B indicates the professional
qualifications of the ethnographers and the dates of their field
work.

The second factor is the reliability of the instrument. Several individuals, using the same instrument, and reading the same ethnographic materials, may nonetheless disagree about the appropriate coding of a particular item. A proper method of determining the extent of this problem is to have several individuals code the same materials, using the same instrument, and compare or correlate their codings. Unfortunately, I lacked the resources to do this.

Some of the items that I used, however, were the same or quite similar to items used in an earlier cross-cultural study by Otterbein (1970). As a matter of chance, four societies in my sample were also present in his sample (Dorobo, Thai or Siamese, Aztec, and Tehuelche). Of the 26 items in Otterbein's research, 24 are identical or closely similar to my own. There were, therefore, a total of 96 (24 x 4) codings on which it was possible to make comparisons between the two studies. Of these 96, however, 38 involved missing data or had other problems of comparability. Of the 58 remaining codings, we agreed on 43 of them, or 74 percent. This overall level of reliability, unfortunately, does not seem particularly high. Some of this is due to small differences in coding criteria (e.g., items on frequency of war, tactical formations, and methods of protection). For example, with regard to items on the frequency of war, Otterbein used three codes, and I used four. Some of the differences may also be due to the sources that were searched.

Statistical Significance.

Chi-square was used to test the statistical significance of relationships in the sample. The null hypothesis in every case is

that there was no relationship between variables in the sampling universe. A relationship was considered to be statistically significant if it would occur because of chance (i.e., because of sampling error) less than 10 percent of the time or in less than 10 percent of randomly drawn samples. In tables this is indicated by a single asterisk or by the notation p < .10. When a relationship would occur because of chance less than 5 percent of the time, this is indicated by two asterisks or by the notation p < .05; less than one percent of the time is indicated by three asterisks or by the notation p < .01.

Relationships that are not statistically significant are indicated either by the absence of asterisks or by the notation p > .10. It is important to note that a non-zero relationship may actually exist in the sampling universe, but due to the small size of the sample, and the moderate strength of the relationship, not be detectable as a statistically significant relationship in the sample.

APPENDIX D

CHART OF SOVEREIGNS

Symbols: D= external defensive warfare
          O= external offensive warfare
          I= internal warfare
          J= judicial/arbitration activities
          T= collection of taxes, tribute, and labor services
          P= police activities
          L= rule making/legislative activities
          R= religious activities

          r= 1st level, residential site
          d= 2nd level, district level
          p= 3rd level, provincial level
          s= 4th level, state level

          no sover   no sovereignty
          ---   no information
          ( )   sovereignty condition was inferred
          NA   not applicable (i.e., activity did not occur)
          ?   no information on level of sovereignty

	D	O	I	J	T	P	L	R
1. Bunda	chief-d	---	chief-d	arbitrator-d	(chief)-d	chief-d	(no sover)	(chief)-d
2. Luvale	(chiefs)-d	chiefs-d	chiefs-d	headmen-r	(chiefs)-d	no sover	(no sover)	chiefs-d
3. Luguru	---	---	---	head of matrilineage-r	no sover	---	---	---
4. Guro	war chief-d	-r	war chief-d	tribal chief-d	village chief no sover	no sover	(no sover)	no sover
5. Babwa	tribal chief-d	no sover	tribal chief-d	chief & council of elders-r	chief-r	chief & council of elders-r	(no sover)	no sover
6. Thonga	chief-p	chief-p	chief-p	chief-p	chief-p	chief-p	chief-p	chief-p
7. Dorobo	no sover	no sover	NA	koret council-d	no sover	koret council-d	(no sover)	no sover
8. Nama	tribal council-p	no sover	tribal council-p	tribal court-d	no sover	kraal council-r	(no sover)	no sover
9. Gogo	sultan-d	sultan-d	sultan-d	sultan-d	sultan-d	sultan-d	sultan-d	no sover
10. Kuba	king-s	king & ibaanc-s	NA	ibeam council-s	king-s	king-s	king & crown council-s	king-s
11. Falasha	petty chiefs-p	no sover	---	---	---	---	no sover	high priest-p
12. Luqbara	---	---	bawara-r	---	no sover	no sover	---	no sover
13. Konso	---	bogalla-r	NA	abba-bida & abba djila-r	(council)-r	no sover	bogallas-r	abba-djila-r
14. Iraqw	-d	---	-r	district council-d	no sover	no sover	district council-d	no sover
15. Songhai	Askia-s	Askia-s	NA	Askia-s	Askia-s	Askia-s	Askia & ulemas-s	ulemas & Askia-s
16. Ahaggaren	amenokal of Kel Rela-p	amenokal-d	amenokal of Kel Rela-p	amenokal-d	amenokal-d	---	amenokal-d	no sover
17. Jur	-r	---	-r	chief & council-r	no sover	chief-r	---	no sover
18. Banyun	---	---	NA	village chief-r	no sover	---	---	no sover
19. Sara	elders-r	elders-r	---	---	elders-r	chief-r	---	no sover
20. Dinka	cattle chief-d	no sover	no sover	master of fishing spear-r	no sover	---	no sover	rainmaker-r

	D	C	I	J	T	P	L	R
21. Iranians	shah-s	shah-s	NA	supreme court -s	shah & par-liament-s	shah-s	shah & par-liament-s	no sover
22. Selung	no sover	NA	NA	no sover	no sover	no sover	no sover	no sover
23. Siamese	king-s	king-s	nokomo-r	king & supreme court-s	king-s	king-s	king-s	king-s
24. Garo	-r	nokomo-r	nokomo-r	nokomo & heads of families-r	-r	no sover	(no sover)	kamal-r
25. Madan	sheikh-d	sheikh-d	sheikh-d	---	sheikh-d	sheikh-d	sheikh-d	no sover
26. Okinawans	king-p	king-p	NA	king-p	king-p	anji-d	---	chief priest-esses -p
27. Chechen	---	no sover	---	no sover[2]	---	Tsar-s[3]	elders-r	no sover
28. Moqh	commis-sioner & superinten-dent of hill tracts-s	commis-sioner & superinten-dent of hill tracts-s	NA	Gov't of East Bengal & sup-erintendent of hill tracts-s	superinten-dent of hill tracts-s	superinten-dent of hill tracts-s	(Indian parliament)-s	head priest-?
29. Gujarati	sultan-s	nobles & rajas-p	NA	quazi-s	sultan-s	sultan-s	no sover	no sover
30. Baiga	NA	NA	NA	Indian judge-s	(Indian prime minister & parliament)-s	Indian police -s	(Indian prime minister & parliament)	pujari-?
31. Purari	pa'ira amua-r	---	pa'ira amua-r	no sover	all the peo-ple-r	elder-r	(no sover)	mari-r
32. Cebu	President of U.S. & Presi-dent of Phil-ippines -s	---	NA	Supreme Court of U.S.-s	President of Philippines & National Assembly-s	Chief of Constabulary -s	President of Philippines & National Assembly-s	no sover
33. Aua	puala-d -r	puala-d -r	---	---	puala-d	---	(no sover)	no sover
34. Mailu	-r	-r	gobuegi & men-r	no sover	all of the people-r	no sover	(no sover)	no sover
35. Tongans	---	chief-p	NA	---	tui tonga-p	chief-p	---	tui tonga-p
36. Sivokakmeit	---	---	-r	no sover	no sover	no sover	no sover	no sover
37. Koita	(rohí ketai-ke)-r	rohí ketalke -r	(rohí ketai-ke)-r	no sover rohí ketalke-r	no sover	no sover	(no sover)	no sover
38. Manihikians	NA	NA	turimen-r	no sover	no sover	ariki-r	missionaries-d	missionaries-d
39. Kapauku	prestige based leader -r	---	tonowi-d	tanowi-d	tanowi-d	no sover	no sover	no sover
40. Tasmanians	no sover	no sover	no sover	no sover	headman-r	no sover	no sover	no sover

	D	O	I	J	T	P	L	R
41. San Juan	---	no sover	NA	---	no sover	no sover	(no sover)	no sover
42. Wukchumni	chief-r	no sover	NA	chief-r	chief-r	---	no sover	no sover
43. Wichita	---	no sover	NA	no sover	---	---	(no sover)	medicine man-r
44. Bunqi	tribal chief -d or band chief-r[4]	no sover	---	chief & okit-cita council -r	chief & okit-cita council -r	chief & okit-cita council -r	chief & okit-cita council -r	no sover
45. Winnebaqo	tribal chief -r	tribal chief -r	---	tribal chief-r	no sover	head of bear clan-r	council of Thunderbird clan-r	no sover
46. Bohoque	chief-r	no sover	NA	no sover	no sover	council-r	(no sover)	no sover
47. Tachi	(tribal chief)-d	tribal chief or war chief-r[5]	NA	chief-r	chief-r	no sover	(no sover)	no sover
48. Kiowa	topadoki-r	no sover	NA	no sover	no sover	topadoki-r	(no sover)	taime keeper & keeper of the ten medicine bundles -d
49. Atsugewi	village chief -r	village chief	NA	village chief -r	village chief -r	no sover	(no sover)	no sover
50. N. Saulteaux	---	chief-r	NA	no sover	no sover	no sover	(no sover)	no sover
51. Jemez	war chief & council-r	war chief & council-r	NA	Spanish King-s	Spanish Gov-ernor-s	Spanish Gov-ernor-s	Spanish King-s	no sover
52. Inca	Inca-s	Inca-s	NA	Inca-s	Inca-s	Inca-s	Inca-s	Inca-s
53. Tehuelche	band chief-r	council & band chief-r	band chief-r	no sover	no sover	no sover	no sover	---
54. Tewa	NA	NA	NA					
55. Aztec	tlatoani-s	NA	NA	governor-r tlatoani-s	governor-r tlatoani-s	governor-r	no sover council of chiefs-s	cacique-r no sover
56. Botocudo	---	chief-r	chief-r	chief-r	no sover	no sover	(no sover)	no sover
57. Zuni	council, bow priesthood-r	council, bow priesthood-r	NA	priestly hier-archy-r	no sover	no sover priestly hier-archy-r	(no sover)	(no sover)
58. Goajiro	cacique-r	---	cacique-r	cacique-r	no sover	no sover	no sover	no sover
59. Chichimec	chief-r	no sover	no sover	chief-r	no sover	no sover	---	no sover
60. Pima	head chief-d	war chief-r	NA	---	committee-r	no sover	village coun-cils-r	no sover

1 either no sovereignty or residential site level
2 contested; either Russians or shariat
3 contested; either no sovereignty or Russian district police
4 depending upon whether tribe is together or not
5 possibly moiety chiefs

APPENDIX E

LIST OF OFFICIALS

01.	Bunda	headman, chief (note: district chiefs existed in some areas
02.	Luvale	headman
03.	Luguru	bambalawe
04.	Guro	tribal chief
05.	Babwa	tribal chief
06.	Thonga	chief
07.	Dorobo	kiruokindet
08.	Nama	chief (kouqui or khoeque)
09.	Gogo	sultans (mtemi)
10.	Kuba	king
11.	Falasha	chiefman, elder
12.	Lugbara	bawara, bigman, elder
13.	Konso	abba-djila
14.	Iraqw	kahamusmoo
15.	Songhai	askia
16.	Ahaggaren	aménokal
17.	Jur	headman
18.	Banyun	chief
19.	Sara	elders
20.	Dinka	cattle chief
21.	Iranians	shah
22.	Selung	not applicable -- acephalous
23.	Siamese	king
24.	Garo	nokoma (headman)
25.	Madan	sheikh
26.	Okinawans	king
27.	Chechen	murshid
28.	Mogh	circle chief
29.	Gujarati	sultan
30.	Baiga	headman
31.	Purari	chief, padi amua
32.	Cebu (Sugbuhanon)	president (mayor)
33.	Aua	puala
34.	Mailu	gobuegi, dubu headman
35.	Tongans	chief
36.	Sivokakmeit (St. Lawrence Eskimos)	headman
37.	Koita	rohi ketaike
38.	Manihikians	ariki
39.	Kapauku	tanowi (headman)
40.	Tasmanians	chief
41.	San Juan	band chief
42.	Wukchumni	chief (old chief)
43.	Wichita	chief
44.	Bungi	tribal chief

LIST OF OFFICIALS (continued)

45.	Winnebago	tribal chief
46.	Bohogue	band chief
47.	Lake Yokuts (Tachi)	tribal chief (possibly one for each moiety)
48.	Kiowa	tribal chief
49.	Atsugewi	chief
50.	Northern Saulteaux	chief
51.	Jemez	war captains
52.	Inca	Inca
53.	Tehuelche	chief of band
54.	Tewa	governor
55.	Aztec	tlatoani (emperor)
56.	Botocudo	chief, headman
57.	Zuni	head bow priest
58.	Goajiro	chief, cacique
59.	Chichimeca	chief
60.	Pima	head chief -- central war chief

BIBLIOGRAPHY

Alexander, Richard D. 1971. The search for an evolutionary philosophy of man. <u>Proceedings of the Royal Society of Victoria</u> 84:99-120.

_____. 1974. The evolution of social behavior. <u>Annual Review of Ecology and Systematics</u> 5:325-383.

_____. 1979. <u>Darwinism and Human Affairs</u>. Seattle: University of Washington Press.

_____, J.L. Hoogland, R.D. Howard, K.M. Noonan, and P.W. Sherman. 1979. Sexual dimorphisms and breeding systems in pinnipeds, ungulates, primates and humans. in N.A. Chagnon and W.G. Irons, eds. <u>Evolutionary Biology and Human Social Behavior: An Anthropological Perspective</u>. pp. 402-435. North Scituate, Massachusetts: Duxbury.

_____, and K.N. Noonan. 1979. Concealment of ovulation, parental care, and human social evolution. in N.A. Chagnon and W.G. Irons, eds. <u>Evolutionary Biology and Human Social Behavior: An Anthropological Perspective</u>. pp. 436-453. North Scituate, Massachusetts: Duxbury Press.

_____, and D.W. Tinkle. 1968. Review of <u>On Aggression</u> by Konrad Lorenz and <u>The Territorial Imperative</u> by Robert Ardrey. <u>Bioscience</u> 18: 245-248.

Almond, Gabriel A. and James S. Coleman, eds. 1960. <u>The Politics of Developing Areas</u>. Princeton: Princeton University Press.

Altmann, S.A., ed. 1967. <u>Social Communication Among Primates</u>. Chicago: University of Chicago Press.

Andrzejewski, Stanislaw. 1954. <u>Military Organization and Society</u>. London: Routledge & Kegan Paul.

Ardrey, Robert. 1966. <u>The Territorial Imperative</u>. New York: Dell.

Axelrod, Robert. 1981. The emergence of cooperation among egoists. <u>The American Political Science Review</u> 75:306-318.

Bagehot, Walter. 1872. reprint ed. 1948. Physics and Politics: Thoughts on the Application of the Principles of 'Natural Selection' and 'Inheritance' to Political Society. New York: A.A. Knopf.

Bandelier, A.F. 1892. reprint ed. 1976. Final Report of Investigations among the Indians of the Southwestern United States, Carried on Mainly in the Years from 1880 to 1885. Part II. New York: AMS Press.

Bardach, Eugene. 1972. The Skill Factor in Politics; Repealing the Mental Commitment Laws in California. Berkeley: University of California Press.

Bartholomew, G.A. and J.B. Birdsell. 1953. Ecology and the protohominids. American Anthropologist 55:481-498.

Benedict, Ruth. 1934. Patterns of Culture. Boston: Houghton Mifflin.

Bigelow, Robert S. 1969. The Dawn Warriors; Man's Evolution Toward Peace. Boston: Little, Brown.

Boas, F. 1911. The Mind of Primitive Man. New York: MacMillan.

Bohannan, Paul. 1954. The migration and expansion of the Tiv. Africa 24:2-16.

Boserup. Esther. 1965. The Conditions of Agricultural Growth. Chicago: Aldine.

Bryant, A.T. 1919. Olden Times in Zululand and Natal: Containing Earlier Political History of the Eastern-Nguni Clans. London: Longmans, Green.

Carneiro, Robert L. 1970. A theory of the origin of the state. Science 169:733-738.

_____. 1978. Political expansion as an expression of the principle of competitive exclusion. in R. Cohen and E.R. Service, eds. Origins of the State. The Anthropology of Political Evolution. pp. 205-223. Philadelphia: Institute for the Study of Human Issues.

Cavalli-Sforza, L.L. and M.W. Feldman. 1981. Cultural Transmission and Evolution: A Quantitative Approach. Princeton, New Jersey: Princeton University Press.

Chagnon, Napoleon A. 1976. Fission in an Amazonian tribe. Sciences 16:14-18.

_____. 1979a. Is reproductive success equal in egalitarian societies? in N.A. Chagnon and W.G. Irons, eds. Evolutionary Biology and Human Social Behavior: An Anthropological Perspective. pp. 374-401. North Scituate, Massachusetts: Duxbury Press.

_____. 1979b. Mate competition, favoring close kin, and village fission-ing among the Yanomamö Indians. in N.A. Chagnon and W.G. Irons, eds. Evolutionary Biology and Human Social Behavior: An Anthropological Perspective. pp. 86-131. North Scituate, Massachusetts: Duxbury Press.

_____, and Paul E. Bugos, Jr. 1979. Kin selection and conflict: an analysis of a Yanomamö ax fight. in N.A. Chagnon and W.G. Irons, eds. Evolutionary Biology and Human Social Behavior: An Anthropological Perspective. pp. 213-237. North Scituate, Massachusetts: Duxbury Press.

_____, and William G. Irons, eds. 1979. Evolutionary Biology and Human Social Behavior: An Anthropological Perspective. North Scituate, Massachusetts: Duxbury Press.

Chomsky, Noam. 1972. Language and Mind. New York: Harcourt, Brace, Jovanovich.

Claessen, Henri J.M. and Peter Skalnik, eds. 1978. The Early State. The Hague, Paris: Mouton.

Cohen, Ronald. 1978. State origins: a reappraisal. in H.J.M. Claessen and P. Skalnik, eds. The Early State. pp. 31 - 76 . The Hague, Paris: Mouton.

Coon, Carleton S. 1962. The Origin of Races. New York: Knopf.

Corning, Peter. 1971. The biological bases of behavior and some im-plications for political science. World Politics 23:321-370.

Dart, Raymond A. 1949. The predatory implemental technique of Australopithecus. American Journal of Physical Anthropology 7:1-38.

_____. 1952. The osteodontokeratic culture of Australopithecus pro-metheus. Ann. Transvaal Museum.

_____. 1953. The predatory transition from ape to man. International Anthropological and Linguistic Review 1:201-213.

_____. 1956. Cultural status of the South African man-apes. Report of the Smithsonian Institution. Washington, D.C. 1955. pp. 317-338.

Darwin, Charles. 1872. reprint ed. 1962. The Origin of Species (6th edition). New York: Macmillian.

Davie, Maurice R. 1929. The Evolution of War: A Study of Its Role in Early Societies. New Haven: Yale University Press.

Divale, William T. 1971. Warfare in Primitive Societies: A Selected Bibliography. Los Angeles: California State College, Center for the Study of Armament and Disarmament.

_____. 1974. Migration, external warfare and matrilocal residence. Behavior Science Research 9:75-133.

Dollard, John and Neal E. Miller, Leonard W. Doob, O.H. Mowerer, Robert R. Sears. 1944. Frustration and Aggression. London: K. Paul, Trench, Trubner.

Durham, William H. 1976. Resource competition and human aggression, part I: a review of primitive war. The Quarterly Review of Biology 51:385-415.

Dyson-Hudson, Rada and Eric Alden Smith. 1978. Human territoriality: an ecological reassessment. American Anthropologist 80:21-41.

Easton, David A. 1965. Systems Analysis of Political Life. New York: Wiley.

Easton, David, ed. 1966. Varieties of Political Theory. Englewood Cliffs, New Jersey:

Ekvall, Robert B. 1961. The nomadic pattern of living among the Tibetans as preparation for war. American Anthropologist 63:1250-1263.

Ember, Carol R. 1974. An evaluation of alternative theories of matrilocal versus patrilocal residence. Behavior Science Research 9: 135-149.

_____, and Carol R. Ember. 1971. The conditions favoring matrilocal versus patrilocal residence. American Anthropologist 73:571-594.

Engels, Frederick. 1891. reprint ed. 1972. The Origin of the Family, Private Property, and the State. ed. and with an introduction by E.B. Leacock. New York: International Publishers.

Estes, R.D. and J. Goddard. 1967. Prey selection and hunting behavior of the African wild dog. Journal of Wildlife Management 31:52-70.

Fady, J.C. 1969. Les jeux sociaux: le compagnon de jeux chez les jeunes. Observations chez Macaca irus. Folia Primatologica 11(1,2):134-143.

Fisher, Ronald A. 1958. second edition. The Genetical Theory of Natural Selection. New York: Dover.

Fossey, Dian. 1979. Development of the mountain gorilla (gorilla gorilla beringei): the first thirty-six months. in D.A. Hamburg and E.R. McCown, eds. The Great Apes. pp. 139-186. Menlo Park California: Benjamin/Cummings.

Fouts, R.S. 1973. Acquisition and testing of gestural signals in four young chimpanzees. Science 180:978-980.

Fried, M.H. 1967. The Evolution of Political Society. New York: Random House.

Frisch, Karl von. 1954. The Dancing Bees: An Account of the Life and Senses of the Honey Bee. translated by Dora Ilse. London: Methuen.

_____. 1967. The Dance Language and Orientation of Bees. translated by L.E. Chadwick. Cambridge, Massachusetts: Belknap.

Gardner, B.T. and R.A. Gardner. 1969. Teaching sign language to a chimpanzee. Science 165:664-672.

_____. 1971. Two-way communication with an infant chimpanzee. in A.M. Schrier and Fred Stollnitz, eds. Behavior of Non-Human Primates, Vol. 4. pp. 117-228. New York: Academic Press.

Gibson, J.Y. 1911. The Story of the Zulus. London: Longmans.

Goodall, Jane and Adriano Bandora, Emilie Bergmann, Curt Busse, Hilali Matama, Esilop Mpongo, Ann Pierce, David Riss. 1979. Intercommunity interactions in the chimpanzee population of the Gombe National Park. in D.A. Hamburg and E.R. McCown, eds. The Great Apes. pp. 13-54. Menlo Park, California: Benjamin/Cummings.

Gumplowitz, Ludwig. 1899. The Outlines of Sociology. translated by Frederick W. Moore. Philadelphia: American Academy of Political and Social Science.

Hama, Boubou. 1968. Histoire des Songhay. Paris: Presence Africaine.

Hamilton, William D. 1964. The genetical evolution of social behaviour. I, II. Journal of Theoretical Biology 7:1-52.

Harris, Marvin. 1977. Cannibals and Kings. New York: Random House.

Haskins, C.P. and Edna F. Haskins. 1965. Pheidole megacephala and Iridomyrmex humilis in Bermuda -- equilibrium or slow replacement? Ecology 46(5):736-740.

Hatch, Elvin. 1973. Theories of Man and Culture. New York and London: Columbia University Press.

Hoese, H.D. 1971. Dolphin feeding out of water in a salt marsh. Journal of Mammalogy 52(1):222-223.

Hotelling, Harold. 1929. Stability in competition. Economic Journal 39:41-57.

Howard, Michael. 1982. The causes of war. Encounter 58(3):22-30.

Inglehart, Ronald. 1981. Post-materialism in an environment of insecurity. American Political Science Review 75:880-900.

Jennings, M. Kent and Richard G. Niemi. 1977. The persistence of political orientations: an overtime analysis of two generations. British Journal of Political Science 8:333-363.

Jolly, A. 1974. The Evolution of Primate Behavior. New York: Macmillan.

Junod, Henri A. 1927. The Life of a South African Tribe. 2v. London: Macmillan.

Keith, Sir Arthur. 1949. A New Theory of Human Evolution. New York: Philosophy Library.

Kortland, A. 1972. New Perspectives on Ape and Human Evolution. The Netherlands: Stichting voor Psychobiologie Universiteit van Amsterdam.

Kotlikoff, L. J. and L. Summers. 1980. The role of intergenerational transfers in aggregate capital accumulation. NBER working paper #445.

Kruuk, Hans. 1972. The Spotted Hyena: A Study of Predation and Social Behavior. Chicago: University of Chicago Press.

Kummer, Hans. 1968. Social Organization of Hamadryas Baboons. A Field Study. Chicago: Chicago University Press.

Lasswell, Harold D. 1965. Introduction to the study of political elites. in H.D. Lasswell and D. Lerner, eds. World Revolutionary Elites. pp. 3-28. Cambridge, Massachusetts: MIT Press.

Lawick-Goodall, Jane van. 1968. The behavior of free-living chimpanzees in the Gombe Stream Reserve. Animal Behaviour Monographs 1(3):161-311.

Lawick, Hugo van and Jane van Lawick-Goodall. 1971. Innocent Killers. Boston: Houghton Mifflin.

Leakey, Richard E. and Roger Lewin. 1977. Origins. New York: E.P. Dutton.

Lee, Richard B. and Irvin DeVore. 1968. Man the Hunter. Chicago: Aldine.

Lindauer, M. 1961. Communication among Social Bees. Cambridge, Massachusetts: Harvard University Press.

Livingstone, Frank B. 1968. The effects of war on the biology of the human species. in M. Fried, M. Harris, and R. Murphy, eds. War: The Anthropology of Armed Conflict and Aggression. pp. 3-15. Garden City, New York: Natural History Press.

Lorenz, Konrad. 1966. On Aggression. translated by Marjorie Kerr Wilson. New York: Harcourt, Brace & World.

Low, Bobbi S. 1979. Sexual selection and human ornmentation. in N.A. Chagnon and W.D. Irons, eds. Evolutionary Biology and Human Social Behavior: An Anthropological Perspective. pp. 462-486. North Scituate, Massachusetts: Duxbury Press.

McDougall, William. 1926. revised ed. An Introduction to Social Psychology. Boston: Luce.

Mason, W.A. 1976. Environmental models and mental modes. Representational process in the great apes and man. American Psychologist 31:284-294.

Mayr, F. 1963. Animal Species and Evolution. Cambridge, Massachusetts: Belknap.

Mead, Margaret. 1940. Warfare is only an invention — not a biological necessity. Asia 40:402-405.

Mech, L. David. 1970. The Wolf: The Ecology and Behavior of an Endangered Species. Garden City, New York: Natural History Press.

Meltsner, Arnold J. 1976. Policy Analysts in the Bureaucracy. Berkeley: University of California Press.

Mendel, Gregor. 1866. Versuch uber pflanzen-hybriden. originally published in the Proceedings of the Brunn Natural History Society. English translation in J.A. Peters, ed. 1959. Classic Papers in Genetics. Englewood Cliffs, New Jersey: Prentice-Hall.

Michener, Charles D. 1974. The Social Behavior of the Bees; A Comparative Study. Cambridge, Massachusetts: Belknap Press of Harvard University Press.

Morley, Derek Wragge. 1955. The Evolution of an Insect Society. New York: Scribner.

Movius, H.L. 1949. Lower paleolithic archaeology in southern Asia and the Far East. in W.W. Howells, ed. Early Man in the Far East. Studies in Physical Anthropology, No. 1, American Association of Physical Anthropologists, pp. 17-82.

Murdock, George P. 1949. Social Structure. New York: Macmillan.

_____. 1967. <u>Ethnographic Atlas</u>. Pittsburgh: University of Pittsburgh Press.

Murphy, Robert F. 1957. Intergroup hostility and social cohesion. <u>American Anthropologist</u> 59:1018-1035.

Naroll, Raoul. 1966. Does military deterrence deter? <u>Trans-Action</u> 3(2):14-20.

_____. 1969. Deterrence in history. in D.G. Pruitt and R.C. Snyder, eds. <u>Theory and Research on the Causes of War</u>. pp. 150-164. New York: Praeger.

Oppenheimer, Franz. 1914. <u>The State: Its History and Development Viewed Sociologically</u>. Indianapolis: Bobbs-Merill.

Otterbein, Keith F. 1968a. Internal war: a cross-cultural study. <u>American Anthropologist</u> 70:277-289.

_____. 1968b. Cross-cultural studies of armed combat. <u>Studies in International Conflict Research Monograph no. 1</u>. <u>Buffalo Studies</u> 4:91-109.

_____. 1970. <u>The Evolution of War; A Cross-Cultural Study</u>. New Haven: Human Relations Area Files Press.

_____. 1973. The anthropology of war. in J.J. Honigmann, ed. <u>Handbook of Social and Cultural Anthropology</u>. pp. 923-958. Chicago: Rand McNally.

_____. 1976. Sampling and samples in cross-cultural studies. <u>Behavior Science Research</u> 11(2):107-121.

Parsons, Talcott. 1937. <u>The Structure of Social Action</u>. Glencoe: Free Press.

Pitt, Roger. 1978. Warfare and hominid brain evolution. <u>Journal of Theoretical Biology</u> 72:551-575.

Premack, D. 1971. On the assessment of language competence in the chimpanzee. in A.M. Schrier and F. Stollnitz, eds. <u>Behavior of Nonhuman Primates</u>. pp. 185-228. New York: Academic Press.

Putnam, Robert D. 1976. <u>The Comparative Study of Political Elites</u>. Englewood Cliffs, New Jersey: Prentice-Hall.

Richerson, P.J. and R. Boyd. 1978. A dual inheritance model of the human evolutionary process I: basic postulates and a simple model. <u>Journal of Social Biological Structure</u> 1:127-154.

Roper, Marilyn Keyes. 1969. A survey of the evidence for intra-human killing in the pleistocene. Current Anthropology 10:427-459.

Rowe, John Howland. 1946. Inca culture at the time of the Spanish conquest. Bureau of American Ethnology Bulletin 143 2:183-330.

Rumbaugh, D.M., and T.V. Gill, E.C. von Glasserfeld. 1973. Reading and sentence completion by a chimpanzee (Pan). Science 182: 731-733.

Sahlins, Marshall D. 1961. The segmentary lineage: an organization of predatory expansion. American Anthropologist 63:322-345.

_____. 1976. Culture and Practical Reason. Chicago: University of Chicago Press.

Sartori, Giovanni. 1976. Parties and Party Systems. A Framework for Analysis. Volume I. London: Cambridge University Press.

Schaller, George B. 1972. The Serengeti Lion: A Study of Predator-Prey Relations. Chicago: University of Chicago Press.

_____ and G.R. Lowther. 1969. The relevance of carnivore behavior to the study of early hominids. Southwestern Journal of Anthropology 25(4):307-341.

Schneider, Joseph. 1952. On the beginnings of warfare. Social Forces 31:68-74.

Service, Elman R. 1962. second ed. 1971. Primitive Social Organization. New York: Random House.

_____. 1975. Origins of the State and Civilization. New York: W.W. Norton.

_____. 1978. Classical and modern theories of the origins of government. in R. Cohen and E.R. Service, eds. Origins of the State. The Anthropology of Political Evolution. pp. 21-34. Philadelphia: Institute for the Study of Human Issues.

Sillitoe, Paul. 1977. Land shortages and war in New Guinea. Ethnology 16:71-81.

Simpson, George G. 1967. revised ed. The Meaning of Evolution. New Haven and London: Yale University Press.

Skinner, Alanson. Political and ceremonial organization of the Plains-Ojibway. Anthropological Papers of the American Museum of Natural History 11:477-511.

Small, Albion W. 1895. The organic concept of society. <u>Annals of the American Academy of Political and Social Science</u>. Philadelphia 5(5):740-746.

Soustelle, Jacques. 1970 translation. translated from the French by Patrick O'Brian. <u>Daily Life of the Aztecs on the Eve of the Spanish Conquest</u>. Stanford, California: Stanford University Press.

Spencer, Herbert. 1967. <u>The Evolution of Society</u>. ed. and with an introduction by R. Carneiro. Chicago: University of Chicago Press.

_____. 1912. <u>The Principles of Sociology</u>. <u>Volume II</u>. New York and London: D. Appleton.

Steward, Julian H. 1955. <u>Theory of Culture Change</u>. Urbana: University of Illinois Press.

Strickberger, Monroe W. 1976. second ed. <u>Genetics</u>. New York: Macmillan.

Sumner, William G. 1911. <u>War and Other Essays</u>. New Haven: Yale University Press.

Symons, Donald. 1979. <u>The Evolution of Human Sexuality</u>. New York: Oxford University Press.

Talbot, Mary. 1943. Population studies of the ant, prenolepis imparis say. <u>Ecology</u> 24(1):31-44.

Trivers, Robert L. 1971. The evolution of reciprocal altruism. <u>Quarterly Review of Biology</u> 46:35-57.

_____. 1972. Parental investment and sexual selection. in B. Campbell, ed. <u>Sexual Selection and the Descent of Man</u>. pp. 136-179. Chicago: Aldine.

_____. 1974. Parent-offspring conflict. <u>American Zoologist</u> 14:249-264.

Tuden, Arthur and Catherine Marshall. 1972. Political organization. <u>Ethnology</u> 11:436-464.

Turney-High, Harry H. 1949. <u>Primitive War, Its Practice and Concepts</u>. Columbia, South Carolina: University of South Carolina Press.

Vaillant, George C. 1941. <u>Aztecs of Mexico: Origin, Rise and Fall of the Aztec Nation</u>. Garden City, New York: Doubleday, Doran & Company.

Van Velzen, H.U.E. Thoden, and W. van Wetering. 1960. Residence, power groups, and intra-societal aggression. International Archives of Ethnography 49:169-200.

Vayda, Andrew P. 1961. Expansion and warfare among swidden agriculturists. American Anthropologist 63:346-358.

_____. 1971. Phases of the process of war and peace among the Marings of New Guinea. Oceania 42:1-24.

Ward, Lester F. 1914. second ed. Pure Sociology. New York: Macmillan.

Washburn, S.L. ed. 1961. Social Life of Early Man. Chicago: Viking Fund Publications in Anthropology no. 31. Aldine.

White, Leslie A. 1949. The Science of Culture: A Study of Man and Civilization. New York: Grove Press.

_____. 1959. The Evolution of Culture. New York: McGraw-Hill.

Willhoite, Fred H. Jr. 1980. Reciprocity, political origins, and legitimacy. paper prepared for delivery at the 1980 Annual Meeting of the American Political Science Association, The Washington Hilton Hotel, August 28-31, 1980.

Williams, George C. 1957. Pleiotropy, natural selection, and the evolution of senescence. Evolution 11:398-411.

_____. 1966. Adaptation and Natural Selection. Princeton, New Jersey: Princeton University Press.

Wilson, Edward O. 1971. The Insect Societies. Cambridge, Massachusetts: Belknap.

_____. 1975. Sociobiology: The New Synthesis. Cambridge, Massachusetts: Harvard University Press.

_____, and William H. Bossert. 1971. A Primer of Population Biology. Sunderland, Massachusetts: Sinauer Associates.

Wittfogel, Karl A. Oriental Despotism: A Comparative Study of Total Power. New Haven: Yale University Press.

Wynne-Edwards, V.C. 1962. Animal Dispersion in Relation to Social Behavior. Edinburgh: Oliver & Boyd.