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Altitudinal variations in upland regions of the earth create variable climatic zones and conditions. Plant and animal communities must adapt to these conditions, and when they reach their tolerance limits for environmental conditions at the upper levels of a zone, they cease to exist in the environment. Humans also utilize mountains for a variety of reasons. The cultural traits which result from the adaptation of groups of people to mountain environments are unique from those of the surrounding lowlanders. Adaptation to upland areas is most often expressed in a transhumant or agro-pastoral lifestyle attuned to the climatic variations and demands of the mountain environment. This distribution of cultural traits suggests that mountains are considered unique culture areas, apart from but sharing some traits in common with neighboring lowland areas.

The Cultural Significance of Mountain Regions Implications for the Calapooya Divide, Oregon

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THE CULTURAL SIGNIFICANCE OF MOUNTAIN REGIONS IMPLICATIONS FOR THE CALAPOOYA DIVIDE, OREGON

I. INTRODUCTION

Over millions of years in geologic time, plate tectonics and volcanic activity have created a series of mountain ranges which dominate the earth's land surface. These ranges tend to run in long, linear belts along the margins of continents following the distribution of earthquakes, fault zones, and volcanic activity (Price 1981; Peattie 1976). One such belt extends from the Pyrenees in Spain through the Himalayas in Asia. Another lies along the west coast of North and South America.

The existence of mountainous landforms creates a distribution of climate, soil, flora, and fauna on a global scale in marked contrast to that which would otherwise exist. For example, the very fact that mountains project into the atmosphere creates altitudinal conditions or zones different from that of the lowlands. Plant and animal communities must adapt to these conditions. When these plants and animals reach their tolerance limits for environmental conditions at the upper levels of a zone, they cease to exist in the environment.

During the hominid migrations of the last 100,000 or more years, humans and their immediate forebearers have been forced to adapt to the new environments they have encountered. The archaeological record indicates that one of those environments has

been the mountains. Archaeology also suggests that man's use of mountain regions has fluctuated with climatic changes over time as a result of the impact these changes have had on the distribution of vegetation and animals (Benedict 1975; Husted 1974).

People have exploited mountains, within the context of their cultural group, for a variety of reasons. For example, mountain ranges have served as boundaries between cultural groups. The plant and animal resources in a mountain area have provided sources of subsistence for surrounding lowlands. A mountain environment has also served as a special place of awe-inspiring worship for lowland concentrations of people (Price 1981; Kroeber 1947; Evans-Wentz 1981; Anderson 1973; Williams 1911). Some cultural groups have established permanent settlements in upland areas. Sometimes such settlement has occurred because of adjacent area population pressure and scarcity of resources. Other environmental or cultural conditions have also provided the motivating force for settlement in mountains. For example, the disease-ridden lowland forests of the tropics have been cause for some groups to establish themselves in the highlands (Brown 1978).

The various component parts of an environment, including climate, physiography, and resources have an impact on the behavior of the cultural group inhabiting an area. This impact is expressed in the technological and social structure of the group through such cultural traits as mode of subsistence, clothing, shelter, and transportation. In turn, a cultural group will influence its environment through the expression of its cultural traits. These

traits may alter through time as a group develops new ways of dealing with situations. They may also be altered by the adaptation of traits expressed by other groups which diffuse into the area.

Cultural traits, as expressed by a particular group through its adaptation to a given environment, are distributed through geographical space. They tend to cluster at a central core where life becomes adjusted to a specific mode or modes of subsistence. These traits fade out at the boundaries of the culture area where traits from adjacent areas overlap.

The organizing hypothesis of this thesis is that mountain environments require unique material, social, and ideological characteristics of their human inhabitants. These expressed characteristics differentiate mountains as culture areas from those of surrounding areas through a uniqueness not solely derived from the cultural traits exhibited in adjacent zones.

The recognition that cultural traits are expressed within a geographical area led to the development of a theoretical framework known as culture area theory through the work of Mason (1896), Wissler (1926), and Kroeber (1947). I propose using the precepts inherent in culture area theory to assess the general cultural significance of mountains in human history. Using these precepts the following objectives will be pursued:

1. To examine and explain the general role of mountains as a physiographic feature including variable patterns of hydrology, climate, flora, and fauna over time; and, to include, a discussion of generalized upland adaptation by human beings

2. To assess the general significance of mountains

within cultural history from a global, national, and regional perspective, including examples from archaeology and cultural anthropology.

This study presupposes the application of theory to a field experience, and will attempt to interrelate the two. Information obtained through the analysis of numbers one and two above will be applied to a case study of the Calapooya Divide in western Oregon.

In the summer of 1980, the Department of Anthropology at Oregon State University contracted with Umpqua National Forest (Contract 53-04T1-0-97) to engage in a cultural resource survey of the Calapooya Divide. I participated as a member of that team. The survey was designed to assess the cultural significance of remaining features of both Indian and Euroamerican occupation and presence along the Divide in a specified project area from Johnson Meadows to Cowhorn Mountain, a distance of approximately thirty-one miles (see Figure 1). Information from the project was first to be used as a database for the preparation of a regional cultural resource management study for Umpqua National Forest (Starr and Honey 1981).

Research contracted by Federal agencies as part of their responsibilities established through the National Register process, Executive Order 11593, and 30 CFR 800 can be designed to answer a specific question or to resolve a particular issue in response to an immediate need, like a timber sale. Such contracts, in line with the principles and philosophies inherent in cultural resource research, can also be approached within the broader scope of a regional design; i.e., the larger context of human culture (Schiffer

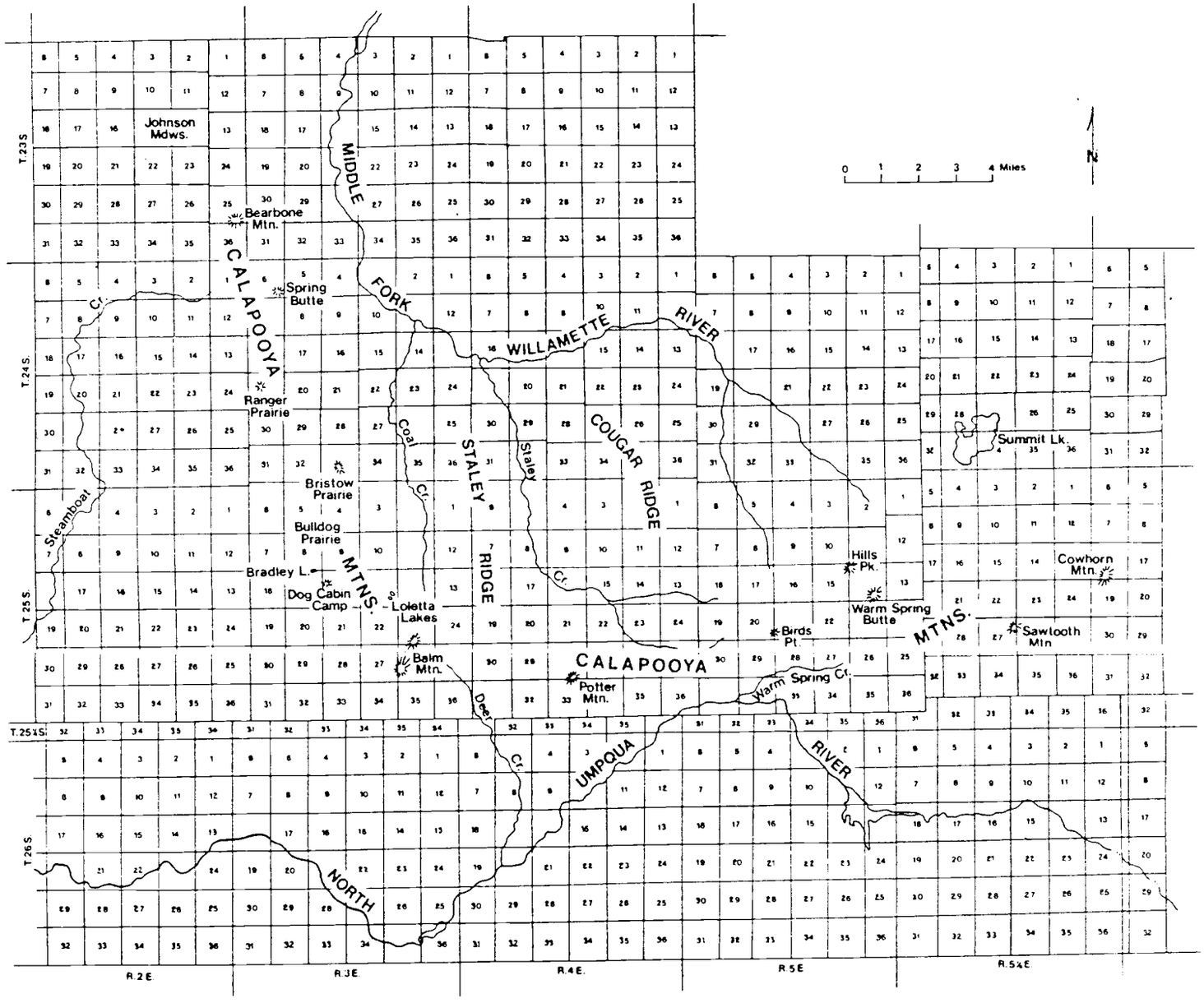

Figure 1. Project area (Starr and Honey 1981)

and House 1977; Goodyear 1978). When dealt with in such a manner the contract will pose questions, within the context of a regional research design, both before and after the actual fieldwork.

The Calapooya Divide lies within the western Cascade physiographic province. It ranges in elevation from about 1,000 feet at Oakridge to 7,664 feet at Cowhorn Mountain. Average elevations for the project area range between 4,000 and 6,000 feet. Information obtained from the survey and through a review of the available literature indicates that both Indians and Euroamericans utilized the Divide. These results raised questions concerning upland cultural adaptation and its pattern or appearance in western Oregon. It is for this reason that the Calapooya Divide was selected as a local example of a mountain cultural system.

RESEARCH PROCEDURES

A review of the literature was conducted that included the Oregon State University Library's card catalog and the following indexes: Dissertation Abstracts, Abstracts in Anthropology, Sociological Abstracts, Historical Abstracts, and America: History & Life. Other indexes were consulted as necessary.

Material utilized in the case example was obtained as part of the cultural survey completed along the Divide in 1980. At that time, a literature review for primary sources was conducted at the Oregon State University Library; Oregon Collection, University of Oregon Library; Lane County Museum research library; and the Oregon

Historical Society Library. The information obtained in this research, in addition to material obtained at the Douglas County Museum, Oakridge Museum and the U.S. Forest Service district offices at Steamboat and Rigdon, was later published in contract report form (Starr and Honey 1981). For the purposes of this study, materials were updated and expanded through checks with the Bureau of Land Management office in Portland, Oregon Historical Society, Willamette National Forest, and Umpqua National Forest.

SUMMARY

Upland adaptation has occurred as an expression of human culture for a very long time. The material, social, and ideological characteristics of mountain people are influenced by, and yet are unique from, surrounding cultural groups. This uniqueness is a reflection of the mountain habitat to which people had to adapt in order to survive. The degree or scope of that upland adaptation has varied with the geographical location of the mountain range and the cultural group utilizing it.

In analyzing mountain cultures on a global scale there are a number of limitations inherent in the available research that must be recognized. With the exception of work by Burling (1965) in southeast Asia, most of the information describing montane cultures comes from temperate mountains. Excluding Burling's work, none of the available studies entered into a comparative analysis of indigenous mountain populations and surrounding lowlanders.

Comparative studies of tropical and temperate mountains are elusive in the literature. Much of the information utilized in this thesis came from ethnographic studies of various mountain populations. These kinds of works provide much in the way of information which, however, is not treated statistically. It is through analysis of ethnographic literature that key variables and relationships can be established which serve as a basis for further controlled, scientific comparisons.

Over the years, cultural research has emphasized the lowlands where a majority of the world's population lives. By doing so, in some parts of the world such as North America, research has bypassed the mountain people as a part of our cultural heritage. It is towards this domain for cultural resource research that this thesis is directed.

II. CULTURE AREA THEORY

Anthropological research presupposes the utilization of a number of very general propositions which make even more general assumptions about human culture. These propositions can be denoted by terms like "savagery" or "magic," among many others. Propositions also refer to concepts like culture traits and their distribution in time and space; or, that culture progressively develops through time.

Anthropologists have utilized such propositions in developing a number of theories which attempt to explain, for example, the rise of particular cultural phenomena, examine changes that have taken place in human history, or deal with the meaning or motives of social phenomena. During the last 100 years, this theoretical development in anthropology has led to such movements as cultural evolutionism, historicalism, diffusionism, functionalism, cultural ecology, and structuralism; among others. These schools of thought resulted from the work of people like Ratzel (1896), Franz Graebner (1911), Wissler (1926), Kroeber (1947), Boas (1940), Radcliffe-Brown (1952), Leslie White (1969), and Levi-Strauss (1963).

When developing a research design, a scientist will choose a vantage point, orientation, or perspective from among the available theories in his field which is desirable for his purposes. The scientist then will seek to justify or test his research design, and its theoretical framework, through the deductive and inductive analysis of results from his field research. The dialectical

analysis and debates that result from such research hopefully provide the growth and development constantly occurring in human knowledge.

The purpose of this thesis is to analyze the significance of mountains from a cultural perspective. Of all the philosophical frameworks available in anthropology, culture area theory serves such an analysis, particularly given its recognition of the impact environment has on the development of cultural traits and the distribution of these traits through space and time.

Around the turn of the century the work of a number of geographers, that included Semple (1911) and Huntington (1927), heavily influenced the anthropological view of culture-habitat relationships. Their work suggested that while habitat was not the prime determiner of culture; its component parts, consisting of climate, physiography, and resources, helped shape the behavior of groups and individuals who in turn influenced their environment.

Different habitats have various potentials for human utilization. The "best" habitat for a group of people will depend upon the cultural values they have developed over time which provide them with the familiarity and techniques necessary for their survival. Where one group has adapted, another may well disappear. This will occur particularly where a cultural group has a given level of technological development and cultural history which does not lend itself to marked changes in subsistence techniques. As a group's general state of knowledge and technology expands, its ability to control and manipulate its environment is altered, as is

its ability to survive (Kroeber 1923).

The expansion of a group's general knowledge can occur through the acquisition of traits expressed by cultures in adjacent areas. This is known as cultural diffusion. Whether a particular trait is accepted or not depends on its utility to the borrowers and their willingness to integrate it. The borrowing of more sophisticated ideas presupposes a complex socio-cultural level on the part of the borrowers. The diffusion of elements of social structure encounters greater difficulties than those of material traits. Rejection of certain cultural items may well be due to their incompatibility with established customs which are based on long tradition (Dixon 1928; Graebner 1911; Keesing 1958; Barnett 1953).

Utilizing a wide variety of cultural traits, humans have chosen to live in a number of environments. In assessing the distribution of the world's population, one finds a concentration of peoples on the steppes and in semi-tropical and temperate forest lands. Such areas provided a great range of cultural alternatives in subsistence techniques. Those areas where smaller numbers of people chose to live included deserts, scrublands, swamps, and mountains. Man's residence in such environments has required a specialized and narrow range of cultural adjustments. The battle for survival is as difficult for humans as it is for the plant and animal populations (Keesing 1958).

The recognition that the cultural adaptation of humans to their environment is distributed over geographical space led Ratzel,

a German geographer, to propose the Kulturkreise, or culture circle. A philosophical school developed which mapped the world's culture areas and traced the routes between them over which cultural traits had diffused (Ratzel 1896). The principles inherent in Ratzel's Kulturkreise were utilized by Franz Graebner to develop quasi-historiographic principles for recognizing diffusion in the areal distribution of cultural traits (Graebner 1911). Their work also influenced researchers in England; including G. Elliot Smith who argued that Egyptian civilization was the center of cultural innovation. It is to Egypt that one could trace the clusters of cultural traits that occurred in the world (Smith 1915).

In the United States, Franz Boas was also influenced by the German geographic approach to cultural analysis. In his development of the historicalism movement, Boas argued that each culture represents a historical growth shaped by its social and geographic environment. It is also affected by the way it develops the cultural material that comes into its possession from the outside and through its own creativeness (Boas 1940).

The historicalism of Boas stressed identifying component elements of culture through objective observation and field work. Those influenced by the school studied specific cultures in terms of the significant behaviors or traits involved in the culture. Researchers initiated the process of classifying those traits by isolating principles of order such as patterns and areas. They did so by sorting through an inventory of factors involved in cultural growth and change that included habitat, the unity of biological and

psychological potential, and the creative and communicative processes (Keesing 1958; Honigman 1976).

It was out of this framework that Mason (1896), Wissler (1926), and Kroeber (1947) developed the precepts behind culture area theory through their analysis of North American Indians. Wissler and Kroeber, following the example of Mason, drew maps grouping Indian tribes into areas based upon a combination of geographical and cultural features.

It is Wissler who is generally credited with formalizing the culture area concept. In his work with the North American Indian, he looked directly to geographical features in an area to explain population density and the presence or absence of cultural traits dealing with subsistence, clothing, shelter, and transportation. Humans, he felt, adapted to their environments and became stable. He also believed that certain traits common to groups in an area would cluster at a cultural center. Life at that center became adjusted to a specific mode of subsistence which was influenced by climate and other environmental factors. As new technology diffused into the area the physical environment would exercise a selective influence. He also argued that traits unconnected with ecology tended to thin out from one region to another because the resources supporting a particular way of life would alter, with others taking their place. It is at these boundaries where he saw traits from adjacent areas overlapping (Wissler 1926).

Kroeber recognized as well the different degree of complexity within a culture area and between areas. He refers to the

development in cultural intensity; i.e., the degree of growth attained in regions where cultural context is complex enough to require systematization, refinement and specialization for its survival. High intensity cultures would absorb more traits and radiate more as well. Barring fundamental changes in subsistence patterns, he felt climax points would tend to remain geographically fixed in an area (Kroeber 1952).

As with any theory or philosophy, there are those who do not ascribe to the tenets of culture area theory as formulated by people like Wissler. For example, Dixon (1928) attacked the culture area concept as not reflecting the less regular geographic realities of cultural distribution found in some areas of the world. Where communication routes were more open with greater interaction, as in the steppes of Europe and Asia, the trait distributions tended to be patterned less on a geographic basis and more on other aspects of culture including economics, language, religion, or nationality.

While it is true that the physiographic aspect of culture area theory may not be appropriate in all situations, the concept of culture area has been utilized in several regions of the world. It has particular validity with regards to geographical parameters in North America. This is due to the continent's large "natural" regions and the fact that intergroup contacts occurred primarily on foot (Keesing 1958). As a result of these two factors, among others, man became a closely knit part of the total ecological system of the local landscape.

The work of Ratzel, Boas, Mason, Wissler, and Kroeber has been refined over the years so that the concept of culture area in contemporary research has come to mean a geographical territory in which characteristic culture patterns are recognizable through repeated associations of specific traits. These traits occur within one or more modes of subsistence that are related to the particular environment. Delineation of such areas is made within the realm of the area's history; and through application of the principles inherent in independent invention, culture borrowing and cultural integration (Ehrich 1968). While there is a general pattern to a culture area, the distribution of its elements is not necessarily uniform. Transition from one area to another may be a matter of gradation that contributes to a composite culture.

Within a geographical territory, topographic forms such as river systems or mountains may serve to direct human contacts inward, thereby producing cultural isolates. This results in consistency of culture patterning; and, at the same time, it delimits independent trait and trait-complex diffusion. Such factors seem to persist through time, finding expression in either continuations of cultural traditions, or the reappearance of the same areas and boundaries in spite of discontinuous culture history (Ehrich 1956).

As indicated in the preceding discussion, culture area theory recognizes that the physical environment affects the social and technological development and diffusion of a culture within a geographical area. One may therefore realistically analyze the

cultural role that mountains have been assigned and have actually played. In doing so, it is necessary to keep in mind that an environment will in turn affect the material and social expression of a group and be affected by those traits. Indeed, mountainous habitats require unique material, social and ideological characteristics of their human inhabitants. It is the expression of those traits as adapted to the environment that gives mountains their unique cultural expression.

III. MOUNTAINS AND UPLAND ADAPTATION

Numerous theories have been advanced over the years regarding the origin of mountains. Research conducted by oceanographers since the 1950s has led scientists to suggest that the earth's crust is composed of rigid plates which move in different directions. Where these plates have collided, they buckled into mountains; and where they were pulled apart, new crustal material was formed. The end result was a series of mountain types that include volcanic; faulted; folded; and combinations of the preceding (Price 1981; Peattie 1976).

An assessment of the earth's land mass shows a series of mountain belts which extend along the margins of continents. One such belt runs from Alaska through the tip of South America, and another from the Pyrenees through the Himalayas. In addition to these major belts, one also finds ranges like the Atlas in Africa and the Urals in the Soviet Union.

What constitutes a mountain in these varied parts of the world is open to a wide range of interpretations. In the Arctic, high mountain scenery occurs at sea level, while in the tropics it may be absent at elevations of 9,800 feet or more. The Tibetan Plateau reaches an elevation of 16,500 feet, but is not classified as mountainous (Price 1981). Some researchers have finally reached the conclusion that elevation above sea level alone is not an adequate measure for defining a mountain region (Hollermann 1973).

Instead, a mountain is viewed as an elevated landform of high local relief (1,000 feet or more) with much of its surface in steep slopes. This is usually accompanied by distinct variations in climate related to altitudinal belts (Price 1981). These climatic variations may be accompanied, but not necessarily so, by changes in geomorphic processes and landforms, soil and water regimes, as well as entire ecosystems (Hollermann 1973). The actual high mountain landscape is the area above the climatic timberline where glaciation, frost action, and mass-wasting are the dominant processes.

Climate is a product of the interaction between the earth's surface and the atmosphere above it within a very complicated system of physical and chemical actions and reactions. Mountain climates occur within the framework of the surrounding regional climate, and are controlled by latitude, altitude, location on a continent, ocean currents, prevailing wind direction, and the location of semi-permanent high and low-pressure cells.

Because mountains present a small land area to the atmosphere at higher elevations they are unable to modify the temperature of the surrounding area, unlike the lowlands. Furthermore, the composition of air changes rapidly with altitude. It loses water vapor, carbon dioxide, and suspended particulate matter. This thin, pure air cannot hold the heat that there is minimal land mass to reflect. A common denominator among mountains is consequently a change in climate with increasing altitude, regardless of the accompanying biotic assemblage.

Given there is a wide variety of climates that are reflected in mountain regions on a global scale, it also follows that there is a wide variety of plant and animal life. In some areas where arid conditions reach into the higher elevations, one will find sagebrush. In others, there are needleleaf evergreen conifers, broadleaf evergreen trees, and broadleaf deciduous trees depending on the latitude and longitude of the mountain region. A forest that exists at lower elevations will most often give way to those better adapted to the cold as one goes up a mountain, until conditions become so unfavorable that trees can no longer grow. Lower mountain forests are most often known as the submontane or montane zone; the higher forest composes the subalpine zone; and above that is the alpine zone (Price 1981; Webber 1979; Costello 1975).

The distribution of animals in mountain ranges is much more difficult to assess than that of the vegetation. Their distribution is complicated by a daily or seasonal migration pattern that includes a winter range, summer range, breeding area, and migration route. Most animals who live at high altitudes do so only in the summer, spending most of the year at lower altitudes. As with vegetation, there is a decrease in number and diversity of species with a rise in altitude. Those who survive at the higher elevations are viewed as generalists who are able to cope with a broad range of environmental conditions (Price 1981; Webber 1979; Costello 1975).

Environmental conditions in mountain areas have not always been constant over time. A number of glaciers are present in some areas which are remains from past glaciation. The growth, retreat,

and maintenance of glacial systems affects climatic conditions. Periods of glaciation tend to be cool and moist, whereas interglacials are warmer and drier. These changes in climatic conditions have affected the altitudinal distribution of plants and animals in mountainous regions. So too have they affected the presence of humans according to the archaeological record (Husted 1974; Benedict 1975).

Humans employ adaptive techniques with which to exploit their environment as a reflection of their cultural and technological history. These techniques may develop through independent invention or diffusion from neighboring groups of people. The adaptive abilities that mean survival in a temperate steppe will not necessarily insure survival in a desert or alpine region. Nonetheless there are certain lifeways, such as pastoralism, which cut across environmental zones differentiated primarily by nuances in technique.

Highland areas have been exploited in a variety of ways that include sedentary agriculture, hunting and gathering, nomadic pastoralism, and transhumance as well as mixed grazing and farming on a sedentary basis. Each of these subsistence modes is an adaptation to the vertical distribution of different environments, different seasonal conditions at each level, the stratification of resources, and the need for a staggered schedule for their exploitation. It is the required adaptation to an altitudinal environment that gives each of these lifeways the connotation of "upland adaptation."

Sedentary agriculture is most widely employed in the tropical mountain regions where the soils and climate at higher altitudes are more favorable than the disease-ridden lowlands. Terracing and irrigation are common attributes. Where tropical groups maintain livestock, the animals are often secondary to the cultivation of crops and usually are allowed to fend for themselves. Most tropical mountain agriculture is at the subsistence level, with year-round growth of crops. In some areas, like the Ethiopian highlands, crops are grown from the lowlands up to the limit of agriculture at 12,000 feet. A similiar range of environmental exploitation occurs in the Andes of Columbia and Peru. Each of these areas is marked with elaborate and intensive use of terracing (Brown 1978; Young 1962; Price 1981; Burling 1965).

Nomadic pastoralism occurs primarily in arid and semiarid regions where small groups of people and animals utilize land that has a low carrying capacity. These nomads migrate to the upland areas during spring and early summer with the growth of grass and return to the lowlands with the winter snows. As a lifeway it has been found primarily in the Old World in areas like the highlands of East Africa, the Atlas Mountains of North Africa, the Balkans in the Mediterranean, and the western Himalayas. Such nomadism often occurs in conjunction with sedentary agriculture. The contrast in lifestyles of the two cultural groups in one geographical area not only creates conflict but also provides a mutual exchange of goods (Turnbull 1972; Gellner 1969; Price 1981; Dysonhudson 1980).

Transhumance operates on many of the same principles as nomadic pastoralism but with the addition of cultivation in valley fields. Most of the population remains in permanent settlements year-round while a small group takes the animals to highland pastures. During the winter, herds are maintained in lowland pastures, often in shelters, with supplemental feed. In some areas, the migration involves a few miles and others as much as 200 miles. As a basic land-use method, transhumance has been more widely adopted throughout the western United States, South America, New Zealand, Australia, Africa, Eurasia, and Europe than nomadic pastoralism (Price 1981; Stewart 1976; Wilson 1977).

Though not often referred to in works dealing with utilization of mountain areas by humans, hunting and gathering is also a means of subsistence some cultural groups have employed in places like Africa and North America. These people tended to follow the game animals as they moved on their seasonal rounds, and to gather vegetable resources as they ripened. They knew how much to take at any one time without exhausting their environment, and where to be when the food became available. These people moved to the highlands in the summer months and wintered in the adjacent lowlands within a defined territory (Turnbull 1972; Loendorf 1973). Anthropologists define this seasonal exploitation of resources as transhumance. It differs from the operational definition of geographers (Price 1981) in that formal agriculture is not practiced and domesticated animals are not utilized.

In middle-latitude mountains, one finds a lifeway based on grazing and cultivation that is known as "mixed agriculture" or mountain pastoralism (see Figure 2). Animals are taken to high pastures during the summer while intensive farming occurs on the slopes and in the valleys. As in transhumance, the animals are brought back to the valleys to winter on supplemental feed. The difference between transhumance and mountain pastoral life is the permanent occupancy of the latter style. The movement of livestock usually occurs between upper and lower slopes of a mountain area versus the mountains and the surrounding lowlands. The animals are not sent to the upper pastures because lowland pastures dry up; i.e., as in transhumance, but rather to use lower pastures for growing winter feed. This form of mountain pastoralism is found throughout the Alps, Pyrenees, Caucasus, Himalayas, Andes, Atlas Mountains, the New Zealand Alps, and the mountains of Scandinavia (Price 1981; Burns 1963).

People choose to live in an environment which will provide them with a means of subsistence. These choices are made within the context of the group's cultural and technological history which provides them with the familiarity and techniques necessary for survival. The preceding discussion illustrates those techniques utilized cross-culturally by groups who have chosen to live in mountains. Where and to what extent one finds each practiced varies with the particular mountain range and the cultural group utilizing it. All of these modes of subsistence make it apparent that "the most basic characteristic of mountain life in the broadest sense is

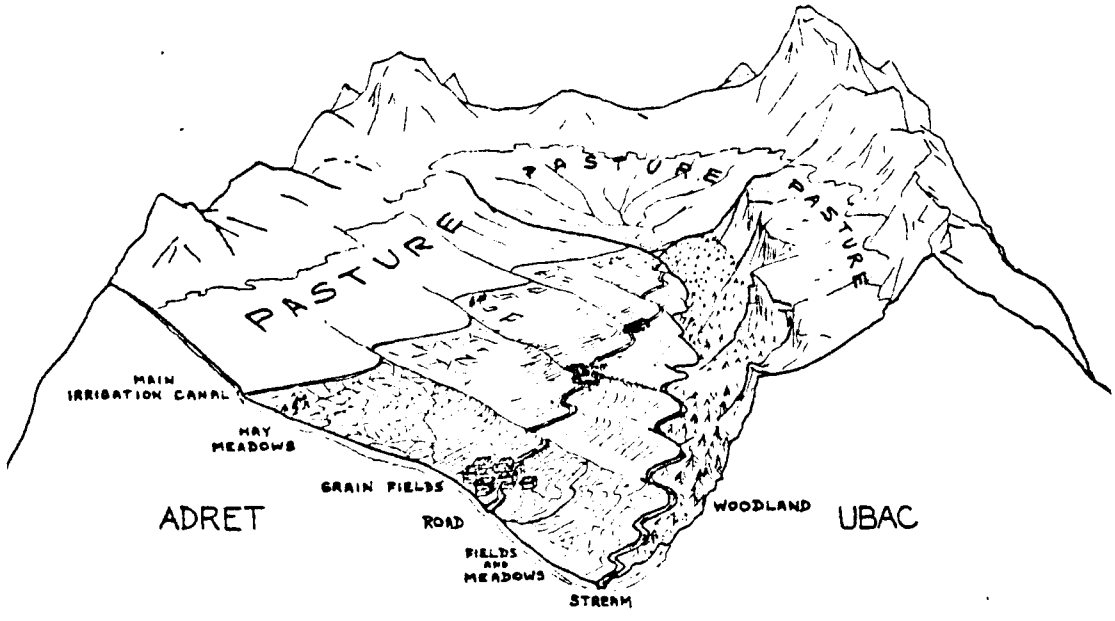

Figure 2. Agricultural occupation of a lateral valley (Burns 1961:33)

the vertical stratification of resources and a staggered schedule for their exploitation within an annual cycle (Planhol 1970:235)." This cycle may become a very complicated schedule in varying degrees of both human-animal and agricultural-pastoral migrations. This upland adaptation requires of each diverse cultural group unique material, social, and ideological characteristics indicative of their common environmental theme.

IV. GLOBAL MOUNTAIN REGIONS

The distribution of human societies in mountain zones on a global scale reflects a wide variety of adaptive techniques. These techniques range from mountain pastoralism to hunting and gathering, altered only in the last one hundred years by the rapidly changing political and technological environment of the western world.

In a review of the literature, rarely does one find a treatment of mountain regions as unique culture areas, unified by the underlying cultural patterns which correspond to the mountain zone as physiographically and ecologically defined. Burns (1963) is an exception to that rule in his analysis of the Alpine region of Europe.

The Alps have been characterized as a barrier separating the Mediterranean from northern Europe. They also have been viewed as a formidable wall; as an obstacle to travel from one region to another (Price 1981; Peattie 1976; Johnstone 1979). It is Burns' contention that the Alpine zone constitutes instead a discrete culture area. He feels that a complex, stable, finely integrated pattern has emerged in the region. This pattern developed as the end product of a long-term process of evolutionary adjustment covering a period of some 4,000 years (Burns 1963:130).

Burns' analysis of the Alpine region suggested a number of characteristics to him which he felt emphasized the cultural homogeneity of the region irrespective of the diverse ethnic, national, linguistic, and religious distinctions. These include

basic subsistence practices, land tenure and technology, forms of occupational specialization, distinctive aspects of social structure at the level of the local peasant community and the larger cantonal districts, and certain associated cultural values such as flexibility, stability, cooperation, and independence which are logically consistent with the overall configuration of structure and custom (Burns 1963:130).

Throughout the Neolithic period, the archaeological record suggests that the Alps were occupied by nomadic pastoralists with regularity on a seasonal basis, pushing their herds into the mountains during the warm months. Agriculture did not appear in the region until the Bronze Age or early Iron Age. During the Medieval period two types of transhumance occurred. One was pastoral and the other a form of agro-pastoral where crops were grown and taken back to winter villages in the lowlands (Burns 1963; Harding 1978; Phillips 1980).

Transhumance as a lifeway in the Alps climaxed in the fifteenth century. It has persisted to the present from the Basque country to the eastern Balkans, however, in a form that has changed little over the last 2,000 to 4,000 years. Two hundred mile treks are not uncommon. These groups spend three months at the high altitudes in pastures leased from the uplanders, and return to the Mediterranean at first snow (Burns 1963; Price 1981; Fotiadis 1980; Chapman 1979; Davidson 1980).

With permanent settlement in the uplands came a unique agro-pastoral or mountain pastoral economy where cultivation and

herding were finely balanced and mutually reinforcing (see Figure 3). In small plots, land close to the village was cultivated during the short growing season with enough vegetables and fruits to last through the winter. Land on the slopes was used for both cultivation and harvesting hay to feed the animals during the winters. Meadows on the upper slopes were used for grazing the animals in the summer months (Burns 1963; Cole 1972; Netting 1972).

The long winter months set up a situation for the uplanders to become involved in artisan activities like smithing, wood-carving, watch making, and weaving. History indicates that these uplanders peddled goods to the lowlanders at least as early as the fourteenth century. These activities, in addition to the skills required for managing irrigation and other communal operations over the last millenium, gave the uplanders an expertise in business and politics that provided the culture with a unique reputation in Europe (Burns 1963).

In the Alpine region, the corporate community limited its membership to the actual community. Outsiders who were from the next valley or the lowlands were not welcomed. Some of these villages had sustained rates of in-marriage as high as 96 per cent for a period of 100 years or longer. Despite the apparent independence, villages in topographically related valleys joined together to form cantons. Adjoining cantons formed federal republics (Burns 1963).

Burns (1963) argues that, more than any other form of Alpine organization, the federal republic which developed within the area

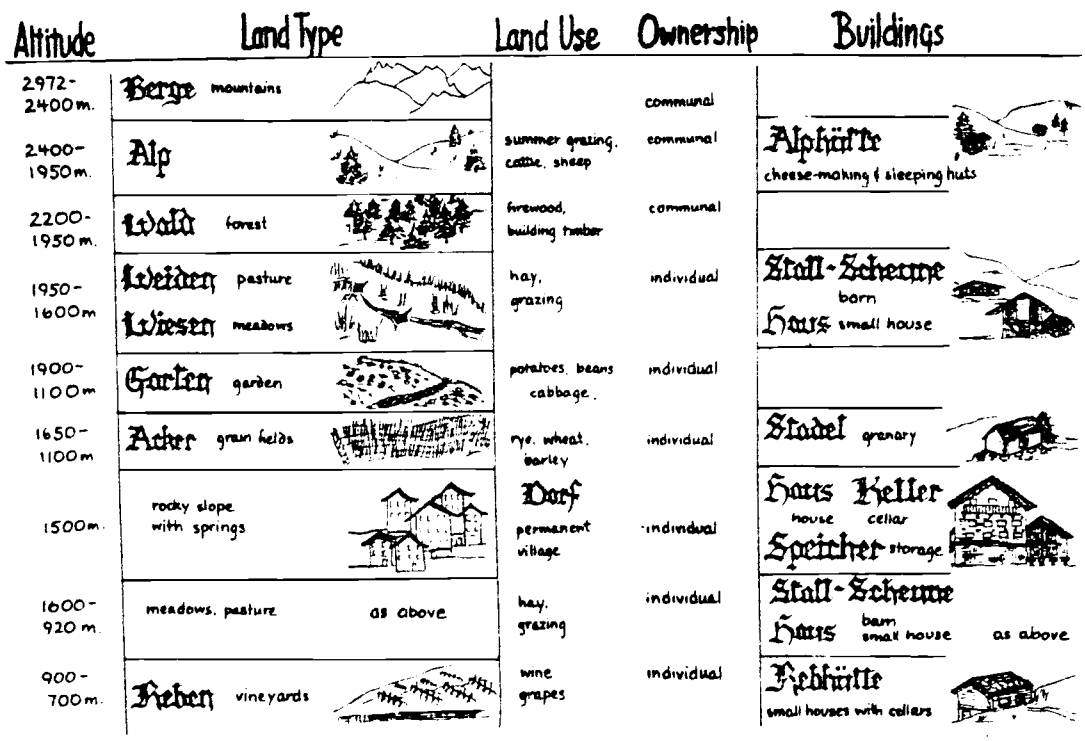

Figure 3. Alpine strategies of land use (Burns 1963:143)

testifies to the ecological and social unity of the Alpine zone. In fact:

> Virtually without exception, wherever they existed, such republics tended to straddle the cordilleran range system. Contrary to the modern tendency to establish international frontiers along the crests of the mountains per se as a homogenous realm distinct from the hill country and the plains below, they extended (reached), in effect, from lowlands to lowlands, across the divide, like a saddle. The canton was a phenomenon of one side (slope) or the other, but the larger transalpine federal republic tended to demonstrate the ultimate ecological unity of both slopes (Burns 1963:149).

In effect, this mountain culture area represents an orderly, independent synthesis of diverse traits and patterns over thousands of years within the framework of a mountain environment.

In Morocco, the Berbers, displaced by latecomers, moved into the less accessible regions of the country, including the Atlas Mountains. They remained independent of any outside control until 1933, though still very much a part of the Moslem world. In a world of high pastures and forests that included some broad valleys, occasionally rich with alluvial soil, the Berbers carved out a life of nomadic pastoralism and transhumance. Some groups moved up and down the slopes of the same valley on tribal lands, particularly in those valleys which lent themselves to irrigation agriculture. Others engaged in long distance migrations from the desert (Gellner 1969).

Sedentary agriculture tends to be practiced in mountainous regions of the tropics. It can be found in such diverse areas as

New Guinea, Thailand, and the Philippines. In Thailand, along its northernmost boundaries, numerous groups of farmers live between the 2,000 and 7,000 foot contours (Young 1962). These are primarily slash-and-burn hill farmers who utilize animals on a secondary basis. Most depend upon the jungle for their vegetables and as a place to hunt and trap wild game. Very often they provide mountain pastures for Thai farmers to keep their cattle and buffalo. Even though some of the groups deal with the lowland Thai, there are others who are so closed as a group they have never met a Thai. Others raise and sell opium to the lowlanders as a cash crop. Many of these hill farmers migrated into the area from places like China and Burma, often in advance of population pressure (Young 1962; Burling 1965).

In New Guinea, the highlands between 3,000 and 7,000 feet have been settled for thousands of years by a people who initially existed as hunters and gatherers. Technology, agriculture, and pigs were brought into the region over trade routes through an intermediary mountain culture living at lower elevations. This resulted in a shift to intensive and semi-permanent agriculture as the mode of existence. Individualized land rights and an organized community defense of territory developed over time within the cultural group. These traits provided the people with a strength and wealth that set them off from the lowlands and adjacent mountain people (Brown 1978; Berndt 1962).

Throughout southeast Asia there are numerous groups of hill people like those described in the preceding two examples. They

occur so often that Burling (1965) suggests the contrast between the hill people and plains people is a constant in the area's diversity. The plains people form homogeneous, dense populations with a single dominant language and are characterized by adherence to one of the major religions. The hill people are heterogeneous with many languages, little political unity, and tenuous political ties with the plains. Burling indicates that the contrast between these two cultural styles goes back in time for 2,000 or more years. It is his contention that the differences in topography have made it difficult for either group to impose their way of life on the other. Nonetheless, they have not been isolated from each other with cultural traits borrowed in either direction.

The utilization of hunting and gathering techniques also provides a means of adaptation for mountain people. Turnbull (1972) found this to be true among the Ik, a small group of hunters isolated in the mountains separating Northern Uganda, Sudan, and Kenya. Mobility is essential to the hunting and gathering mode of existence. The people obtain food fresh each day, knowing how much to take at any one time, with a nomadic pattern geared to this knowledge.

For the Ik, the Kidepo Valley formed a major hunting territory. When the valley became too wet during the rainy season, they would follow the animals through the Diding Mountains into the Sudan hunting and gathering. At the end of the season they would come down into northern Kenya, collecting honey in the Zingout Mountains, climbing back into Uganda and their home base, the Kidepo

Valley. In such a mobile society, it was the diverse environment that provided the central theme that held them together culturally.

Just before World War II, the Ik were "encouraged" to settle in the mountains near Kidepo Valley. No longer were they able to engage in the mobile existence of a hunting and gathering society. Because their economic base was no longer an option, their society destroyed itself through starvation and a destruction of the cultural force that had held them together as a group; much like the Kalapuya Indians of the Willamette Valley (Ratcliff 1973). It was not that the Ik could not hunt or farm in the flat, arid plateau below. Others had. But with regard to the mountains, it is different and in the case of the Ik their adaptability had reached its limits. The Ik without their mountains would no longer have been the Ik (Turnbull 1972:29).

Throughout the globe, one finds mountains being utilized by humans. The examples abound in quantities greater than can be illustrated within the confines of this paper. An attempt was made to select those peoples, as cultural groups, who reflect the varied means of adaptation one finds in human utilization of diverse mountain regions. This utilization ranges from permanent settlement to nomadic pastoralism, and represents a wide range of cultural and technological history.

Regardless of the diverse range in technological expertise illustrated by the groups, there are a number of common traits that occur cross-culturally among these mountain dwellers. Those involved in upland adaptation represent an independent people very

different from the lowlanders and very exclusive as a society. All of the groups illustrated above depend on a form of subsistence agriculture (gathering) and pastoral (hunting) economy diverse only in their technological history. Selling goods or services to the lowland people around them also occurred as a common trait. For the hill tribes of Thailand the cash crop was opium. In the Alps, artisan trades like weaving, watch making and smithing brought in outside money. The groups have, in addition, a loose form of social structure composed of small units which are mutually supportive often through marriage ties. A synthesis of cultural traits from adjoining areas appears, as well, as a commonality in such areas as the Alps and in southeast Asia mountain areas.

V. WESTERN NORTH AMERICAN MOUNTAIN REGIONS

Until recently, North American mountain ranges have remained relatively unsettled compared to other parts of the world. The archaeological and historical records suggest, however, that since the arrival of humans some 27,000 Before Present (Chard 1975) mountain areas have been utilized by both Indians and Euroamericans through the various forms of subsistence illustrative of upland adaptation. These mountains include the Appalachians, Allegheny Mountains, the Rockies, the Sierra Nevadas, the Cascades, the Coast Range, and chains in Alaska. Representative examples of human utilization in the preceding areas were selected from the literature and are included in the following discussion.

PREHISTORIC PERIOD

Archaeologists and anthropologists suggest that humans moved into North America over the Bering Strait at various times during the last 30,000 years following herds of animals which they depended on for their subsistence (Chard 1975). In doing so, research indicates that they moved into the higher elevations of the mountain ranges they encountered. Two such examples can be found on the Brooks and Alaska ranges in Alaska (Schlesier 1967; Hadleigh-West 1967).

The artifact material at Sedna Creek on the Arctic slope of the Brooks Range reflects utilization as an occupation site or

sites. Whether the area was used for only a short period or visited over a long time span was unclear from the archaeological record. The assemblage places Sedna Creek within the British Mountain tradition which is suggested to be tentatively related to a number of locations in northeast Asia and possibly dates to 18,000 BP (Schlesier 1967:219).

Donnelly Ridge is located south of Donnelly Dome in the northern foothills of the Alaska Range at an elevation of 2,675 feet. It is a subalpine forest-tundra region which, until recently, has been a prime hunting area. Archaeological work along the ridge shows a high number of sites reflecting, very possibly, a high human population. Given the number of sites, the suggestion has been made that the area was part of a seasonal round for hunters of herding animals, possibly caribou, who presumably arrived in the area before 10,000 BP (Hadleigh-West 1967:379).

Some researchers would argue that these early migrants were people who exploited mountain zones thereby maintaining a fairly constant climatic and ecological environment as they moved south through the equatorial regions and on to the sub-Antarctic (Mayer-Oakes 1963:117). This hypothesis remains to be substantiated by future archaeological research.

Further south in the Pryor Mountains of Montana, archaeological surveys have uncovered numerous sites which were occupied between 7,000 BP to 1700 AD (Loendorf 1973:107). Analysis of those sites showed grinding tools, usually associated with plant gathering, at the lower elevations with hunting tools and points

found at the higher elevations. Loendorf (1973) argues that such a distribution of artifactual remains indicate a pattern of differential exploitation of resources practiced seasonally at various elevations. These Indian groups lived on the lowland sites in the canyons during the winter months where they found protection from the elements. The size of sites (one to twenty acres) at the upper elevations indicated to Loendorf that the Indians moved their entire living group up during the summer. They did so in order to follow the seasonal migration of big game animals and the ripening of various eatable plants as well as to utilize quarrying materials (Loendorf 1973).

Loendorf, in his work on the Pryors, based his conclusions upon statistical analysis of the remains of 100 sites ranging in elevation from the base of the mountains to the grasslands above the timberline at 7,500 feet and higher. His analysis of the sites covered 12 factors that included proximity of water, abundance of food, available fuel supply, and the presence of quarrying material. Of particular note is his very careful avoidance of the supernatural as a factor because he had no scientific basis upon which to establish a statistical key.

Loendorf (1973) suggests that the decision-making process of the Indians to move from ecological zone to ecological zone was probably based upon the results of weighing the advantages of the resources in one zone, compared to those of another. As part of this process they constantly considered the distance between the zones and the time necessary to move. Ultimately any change in an

ecological zone would result in movement to one similiar to that just exploited; i.e., "Romer's Rule."

Loendorf viewed all of the environmental zones in the Pryor Mountains as part of an overall picture. The archaeological remains reflect a seasonal cycle of subsistence. He therefore came to the conclusion that the mountains could have supported an indigenous population of hunting and gathering people. Work completed by Arthur (1966) illustrates similiar cycles in the Clark Fork Drainage of the Yellowstone River. Loendorf drew upon such studies to further suggest that the Pryor Mountains were not isolated from surrounding mountain ranges. Those groups who spent their summers on Big Horn could easily have chosen to spend their autumns in the Pryor grassland.

These conclusions contradict those of prehistorians who have argued that the Pryor Mountain, Big Horn Canyon, and Clark Fork River areas obtained their importance as an avenue of contact between the Great Basin and the northwestern Plains (Loendorf 1967:143). Loendorf's work suggests rather that the inhabitants can be viewed as a stable population of people exploiting the resources within their territorial limits over the last 7,000 years. His theory does not alter the fact that others have migrated into, through, or out of the area.

Archaeological work in the Rocky Moutains to the south shows similiar adjustment of lifeways to a mountain-adapted subsistence economy by the mountain-valley peoples. For example, Benedict (1975) indicates that in the Rockies of Colorado the broken terrain

along the mountain front provided a pivotal environment for a lifeway of hunting and gathering in a seasonal transhumance during at least the last 12,000 years. In these foothills, hunters passed the coldest months and travelled west into the mountains for the summers when the climate was warm and relatively dry. In times of cool and moist climate, these peoples moved east into the Plains as part of their seasonal rounds.

In the Indian Peaks region of the Colorado Front Range, archaeologists found numerous sites primarily consisting of game drives and campsites. The game drives were lines of cairns which the Indians used to direct animals to within close range of hunters who were concealed in rock-walled pits. The drives occurred on all the important passes and virtually all narrow ridges above the timberline. The campsites were concentrated near the present timberline along the shores of lakes and streams, particularly in those valleys that lead to major passes or provide access to the game-drive systems. Milling slabs and handstones were present in the campsites indicating to researchers that gathering was an adjunct to the summer economy (Benedict 1975; Husted 1974). During the wet, cooler periods the groups moved out into the Plains, and with the dryer times, the Indians moved into higher elevations or northward where there was sufficient moisture to support plant and animal populations.

In Idaho, Earl Swanson (1972) argued that the northern Shoshoni culture moved into the mountains about 8,500-8,000 years ago as hunters and gatherers. Over time these people became so

intertwined with the mountains that their territorial limits and the mountain area were one and the same. This tradition lasted until white contact, and Swanson came to label it the Bitterroot Culture. Some researchers (Butler 1978) take Swanson to task for his interpretations of environmental change in the area and his correlation between a historic language group and prehistoric remains. Nonetheless his work remains unique for its treatment of the mountains as a cultural area inhabited by an indigenous population.

One of the recurring themes suggested by work in this area of the continent is the presence of a mountain-valley people who used the upper elevations as part of their economic support system. This is not to suggest that people from the Plains did not also use or move through the mountains. Recent research suggesting that mountain regions form a unique province of cultural adaptation is further supported by the work of Patricia Flint (1980). Basing her hypothesis on evidence from archaeological sites in Montana, Idaho, and northwestern Wyoming, she argues that a hunting and gathering form of seasonal transhumance subsistence existed within the Northern Rocky Mountain province unique and apart from that of the Plains and Plateau. Though a unique and separate system of cultural ecology, she suggests the province shared in both Plains and Plateau diffusion spheres. Her cultural chronology spans from 12,000 BP to the Late Prehistoric.

As indicated in the preceding discussion, archaeological research suggests that Indians utilizing mountains in western North

America engaged in a seasonal round of transhumance which placed them in the foothill valleys during the winter and upper elevations during the summer. This subsistence pattern occurred over a long period of time affected only by major changes in the climate that developed as a result of glaciation periods. The pattern continued into the contact period as illustrated by such groups as the Utes who had a long tradition of high mountain occupation (Buckles 1968).

EUROAMERICAN PERIOD

Indians were not the only group of people to utilize mountain environments during human settlement of the North American continent. Historic records suggest that Euroamericans, as they moved across the North American continent, also exploited mountain regions in such diverse areas as the Appalachias (McClure 1934), the Ramapo Mountains (Cohen 1974), and the Cascades (Roe 1980).

In the western United States, the mountain regions were relatively untouched initially by Euroamericans, except for the occasional trapper. Settlers moving west were interested in agricultural land. Population pressure in the lowlands did not become a problem until the late 1800s.

By the mid-1800s, transhumance had become a way of life for ranchers that lasted until the early 1900s. Sheep and cattle were driven into the mountains during the summer and back to the arid lowlands in the winter. Much of the land in these mountain areas is owned by the government. When extensive damage occurred in the

alpine grasslands, restrictions were imposed. Eventually the economics of transhumance favored year-round fenced pastures at the lower elevations, particularly with increased population pressures. Though it is still practiced to some extent, it no longer has the economic significance it once had (Price 1981).

For the most part, Euroamerican exploitation of high mountain regions, particularly in the West, followed the cultural norm portrayed by such groups as the North Cascadians (Roe 1980). Homesteaders coming into the Puget Sound area continued to move up the foothill valleys eastward for a variety of reasons, settling wherever they could establish themselves. These scattered homesteaders lived in valleys where they farmed and ran livestock, in some areas on a transhumance basis. They also hunted, trapped for furs, and gathered vegetable resources. To earn extra income, they would sell various items to the lowlanders, often herbs or furs.

Other settlers lived in the lowlands and foothill valleys only moving into the mountain areas to exploit the forests and minerals on a seasonal basis. With the discovery of gold in the North Cascades, at elevations of 5,000 feet, miners moved into the mountains staying long enough to retrieve what they came for, until winter storms forced them out. Others came to cut lumber and move it downstream for sale in the lowland communities. As transportation systems improved with technology, the Euroamericans began to use the mountain regions for recreation purposes that included hunting, fishing, camping, and visits to the various hot

springs.

During the late 1800s and early 1900s, the Federal government assumed control over major portions of the upland regions in the western United States. Private ownership has been minimal in most of these regions. Contemporary activities primarily include logging, mining, and recreation.

SUMMARY

The Indians and Euroamericans who settled in the mountain areas of North America were hunters and gatherers who followed a seasonal transhumance life style. They lived in the foothill valleys during the winter and moved into the upland areas during the summers to gather resources like food and mineral products. The differences between the two ethnic groups is one of scale, technological history, and cultural applications. For both groups, the mountains became an altitudinal environment within which they chose to live, and to adapt their cultural traits, unique and separate from those groups who remained in the lowlands.

VI. WESTERN OREGON CULTURE AREAS

PREHISTORIC PERIOD

Archaeological investigations along the Cascade Range are of a limited nature, consisting primarily of site testing and surface reconnaissance. The weak state-of-the-art in archaeological research, plus limited ethnographic materials, have left voids in western Oregon's prehistorical literature, unlike the Plateau and Great Basin culture areas. It therefore follows that an analysis of the area's prehistory must include an assessment of what little is known about the migratory routes and lifeways of those groups of Indians in adjacent geographical areas (see Figure 4). By doing so, research hypotheses can be developed concerning the cultural role of mountain regions in Oregon's prehistoric past.

Excavations in western Oregon have utilized projectile point typologies, radiocarbon dates, dendrochronology, palynology, stratigraphy, and historical artifacts to assess the role of the people responsible for the cultural remains. Results from these investigations have been analyzed in relationship to what is known about the Pacific Northwest as a cultural whole, thereby providing a regional context for the data.

Cultural remains in the Applegate Valley of southwestern Oregon suggest human presence in the area at least 10,000 years ago. Other research in the Rogue River Drainage system at Lost Creek and Elk Creek areas (Davis 1980) place humans in the area at least by

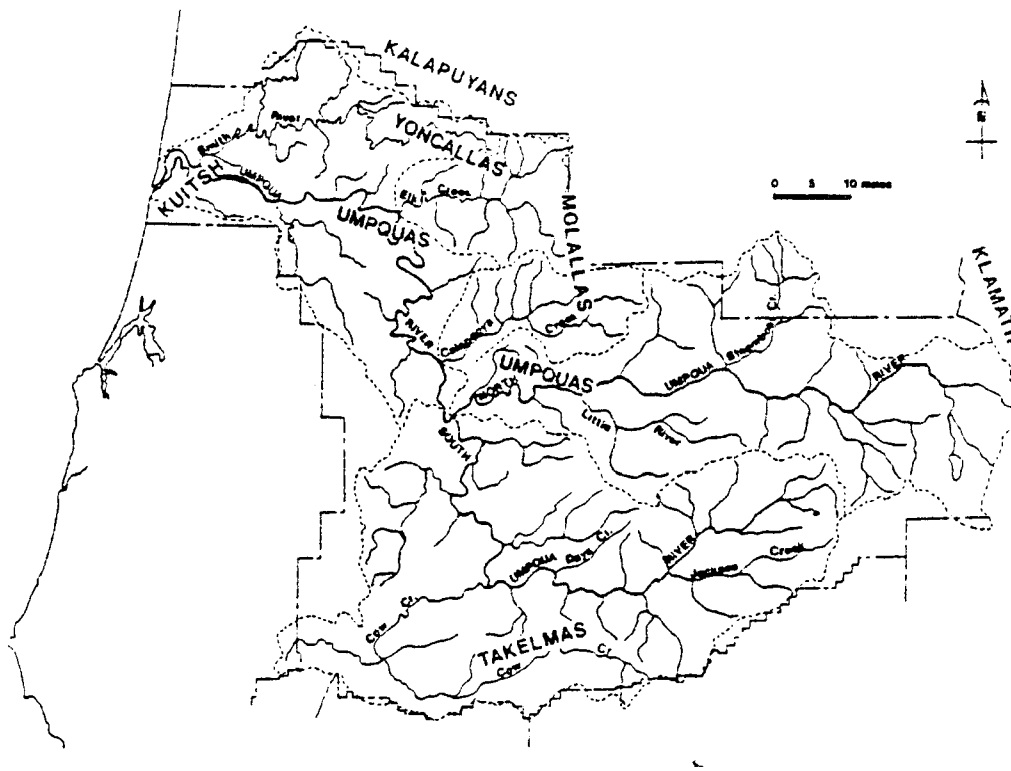

Figure 4. Western Oregon Indian cultural groups

5,000 years ago, following the eruption of Mount Mazama.

In the North and South Umpqua sub-basins, cultural remains at Tiller (Snyder 1978; 1979; 1981b), Muddy Timber Sale Site (Snyder 1981a), and Steamboat (Brauner and Honey 1977) show similarities to remains in the Rogue drainage system, Willamette Valley, and Great Basin. These similarities suggest human movement and regional contacts in the Umpqua sub-basins at least as early as 6,000 years ago.

Archaeological investigations at Baby Rock along the Middle Fork of the Willamette (Olsen 1975), Fall Creek (Cole 1968), and Cascadia Cave (Newman 1966) lend support to human occupation in the northern foothills of the Cascade Range about 8,000 years ago. Earlier habitation in the Willamette Valley at 10,000 years ago is suggested by the presence of a Clovis point retrieved from surface gravels of the Mohawk River (Allely 1975).

Results from archaeological research in western Oregon, though limited, have led investigators to suggest a number of hypotheses for the prehistoric chronology of the region (Davis 1974; Honey and Hogg 1980; White 1979; Beckham 1981). Research efforts in southwestern Oregon prompted Honey and Hogg (1980) to offer the following chronology:

Earliest human and penetration occupation	14,000-7,000 BC
Upland hunting adaptations, early phases	6,000-2,000 BC
Lower riverine adaptations	3,000-1,500 BC
Upland hunting adaptations, later	2,500 BC-AD 1600

phases	
Coastal adaptations	2,500 BC-AD 1600
Athabaskan intrusions	1,500-1,000 BC
Ethnographic present	AD 500-1800

Davis (1974) drew somewhat similar conclusions in his work in the Rogue River Drainage system. White's (1979) investigations of the Upper Willamette Valley led him to suggest the following time frame:

Period I (Big Game Hunting Period)	8,000-6,000 BC
Period II	6,000-4,000 BC
Period III	4,000-250 BC
Period IV	250 BC-AD 1700
Period V (Protohistoric and Historic Period)	AD 1700-1850

In his analysis of the Willamette Basin prehistory, Minor proposed a cultural sequence that related archaeological remains in the region to two broad cultural stages, i.e., Paleoindian and Archaic (Beckham 1981). The following time frame is part of that sequence:

Paleoindian	9,000 BC-6,000 BC
Early Archaic	6,000 BC-4,000 BC
Middle Archaic	4,000 BC-AD 200
Late Archaic	AD 200-1750
Historic	AD 1750-1855

Irrespective of the different time spans offered in the chronologies, the available archaeological record of western Oregon

suggests a number of constants during the long history of its human settlement and habitation.

Paleoindian traditions in North America are dated to 27,000 years ago and last until 18,000 BC in places. These are followed by a big game hunting tradition that spread rapidly across North America. Hallmarks of the tradition include Clovis/Llano (10,000 BC) and Folsom (9,000 BC) diagnostic lance points. Alleged Clovis and Folsom points found in western Oregon (Brauner and Honey 1977) lead investigators to speculate that big game hunters came into western Oregon between 12,000 and 7,000 years ago. Further substantiation is needed, however, before such a speculation becomes acceptable. After 5,000 BC, an upland adaptation appears in the archaeological record, resulting either from the intrusion of people or the adoption of a new stone technology from the Great Basin or Plateau through the Cascade passes. Adaptation of riverine/upland hunting tools appropriate to western Oregon included particularly the side-notched, leaf-shaped points found in many locations.

Researchers hypothesize that as upland peoples became more familiar with resources west of the Cascades they moved down the river systems to the coast after 3,000 BC (Honey and Hogg 1980). While documentation of such a movement is nonexistent, the work of Butler (1962), Cressman (1960), and Jacobs (1937) support such a theory. The archaeological record suggests a number of innovations in lithic technology by 2,500 BC that lasted well into the ethnographic present. These innovations included mortars; pestles; micropoints; triangular, stemmed point styles; and scraping and

incised tool complexes (Brauner and Honey 1977).

The last major group of prehistoric peoples thought to have moved into western Oregon through the mountain passes did so probably sometime between 1,500 and 500 BC. These Nadene speakers (Athabaskan) from western Canada spread south presumably through the Plateau and Great Basin to the Southwest with splinter groups moving through the Cascade passes and down the river valleys (Sapir 1936; Jacobs 1937). The Athabaskan culture is known for its adaptability (Vanstone 1974) and very possibly came to dominate the uplands of western Oregon, as a result affecting band distributions in the area. By AD 500, western Oregon began to assume the cultural mix and economic lifeways present at white contact.

ABORIGINES OF WESTERN OREGON'S CASCADE PROVINCE

Euroamerican diseases severely reduced Indian populations in the area during the late eighteenth and early nineteenth centuries. Those Indians left had little that enabled them to compete with encroaching white economic patterns (Ratcliff 1973). By the middle 1800s, remaining groups were moved to reservations. During this process of less than two generations, little information of a scholarly nature was recorded that allows contemporary researchers to draw clear and comprehensive classifications of Indians and their lifeways in western Oregon. Accounts kept by early Euroamerican fur trappers, traders, travellers, and settlers were often inaccurate and/or ethnocentric.

In order to describe Indian cultures as they were just prior to any significant white contact (i.e., ethnographic present), researchers utilize techniques from ethnography, archaeology, linguistics, oral history, faunal analysis, and palynology in what is collectively known as ethnohistory. By doing so, they are able to define, with some degree of certainty, a number of aboriginal populations that occupied western Oregon, travelled through it, or utilized its resources during the last 1,500 years. These groups included Willamette Kalapuyans, the Yoncallas, the Umpqua tribes, Athabaskan groups, the Klamath, the Takelma, and the southern Molalla. The degree to which these peoples utilized the area can only be hypothesized from the available ethnographic and archaeological record.

Kalapuyans occupied the Upper Willamette Valley and its tributaries, including the Middle Fork of the Willamette. To the south, the Yoncalla, classified as Kalapuyan speakers, lived above Elk and Calapooya creeks in what is now Douglas County. The Kalapuyan speakers were semi-nomadic, patrilineal bands who traded with adjacent cultural groups. Their class system, based upon wealth and prestige, was composed of nobles, commoners, and slaves (Collins 1951; Jacobs 1945; Mackey 1974).

Ethnographic information suggests that Kalapuyans had an individualistic religion that included shamans, magicians, and guardian spirits. The guardian spirit powers of their religion tended to reside in places like mountains, pools or eddies of rivers. As part of their rites of passage into adulthood, i.e., the

vision or spirit quest, Kalapuyans would go out alone to these places, even if the places were very far away in the hills. There they would build a fire and put a great many rocks on it (Jacobs 1945), in addition to such activities as swimming and fasting. The quality and strength of the spirit powers acquired during these rites of passage determined the social position of the individual within the culture.

The Kalapuyans' settlement patterns and subsistence activities reflected a seasonal round that moved from valley floor to hillside (White 1975; Towle 1979; White 1981; Beckham 1981). In his typology of upper Willamette Valley and tributary sites, White (1975) suggests the Kalapuyans occupied the valley edges, in conjunction with the Douglas fir ecotone, during the late spring and summer to engage in diversified hunting, tool manufacturing, and hide preparation. This pattern of seasonal transhumance is generally accepted among researchers (Newman 1966; Woodward 1974; Beckham 1981). Given what is known about the fluctuation in elevation of the floral community over time (Detling 1968; Hansen 1947; Towle 1979), the locations of these valley edge sites in the sub-basins of the western Cascades may fluctuate just as drastically in altitude. Minor argues that by late prehistoric time the Kalapuyans made little use of adjacent upland areas (Beckham 1981). This assertion remains to be validated by further archaeological research.

From their temporary camps in the hills, the Kalapuyan speakers hunted communally for elk, deer, squirrel, chipmunk,

Pacific mountain beaver, Oregon cougar, timber wolf, and grizzly. Birds in the area included grouse, Cooper's hawk, quail, robin, and eagle. Blackberries, salmonberries, acorns, and other vegetable resources were harvested. The marshy areas yielded camas roots that were baked in earthen ovens for several days. Hooks, lines, weirs, nets, and spears were used to take salmon, trout, eels, suckers, and catfish. More permanent winter villages were usually built near the primary fishing areas (Collins 1951; Jacobs 1945; Mackey 1974).

The Umpquas occupied the Umpqua River basin from Scottsburg to where it meets with the South Umpqua, and then up the North Umpqua to the High Cascades. They were composed of small autonomous bands. Due to the lack of ethnographic and archaeological information, conclusions can not be drawn about specifics of their culture. It is highly likely that they engaged in a riverine system of subsistence based upon a seasonal round similar to the Kalapuyan speakers to the north.

The Takelma peoples of southern Oregon were divided into two groups differentiated by locale, i.e., hill or valley. The valley Takelma lived along upper Cow Creek, a tributary of the South Umpqua; along the middle course of the Rogue River and portions of the Illinois River. The hill or upland Takelma lived near Jacksonville and east to the Cascades (Berreman 1937).

The Takelma, like the other groups, were composed of small autonomous bands made up of the rich, commoner, poor, and slave along patrilineal lines. Unlike the Kalapuyans and the Klamath, the Takelma did not believe in the individual or guardian spirit gained

by fasting and dreaming during the performance of puberty rites (Sapir 1907). Among the Takelma, only the medicine man possessed the power to gain such guardians (Sapir 1907); other specifics, such as rock piling, are not noted.

The Takelma engaged in a seasonal round of subsistence that placed their winter villages adjacent to local streams and rivers, and their temporary summer camps in the uplands. Their food base consisted of fish, camas, acorns, berries, seeds, nuts, and river mussels, as well as both small and big game animals.

The Klamath had their main settlements near Klamath Lake, Klamath Marsh, Williamson River, and lower Sprague River. They were few in number, with semi-permanent winter villages and temporary summer camps. Traditional enemies of the Klamath included the Takelma, Umpquas, and Kalapuyans. The Klamath also conducted off-and-on hostilities with the Molalla, Warm Springs, Sahatin-speakers, and Paiute.

The religion of the Klamath centered around the vision or power quest. At puberty, the young Klamath sought spirits by finding isolated areas, often in the mountains, having real or surmised danger (Cressman 1956; Spier 1930). While there, they piled stones in a cairn-like structure. This process required that some time be spent in the area, for the greater the danger and more difficult the fast these individuals faced, the greater the chance for power.

The Klamath relied on riverine resources, as did their neighbors to the west, and incorporated lacustrine (lake) resources

into their subsistence base, as did their neighbors to the east in the Great Basin and Plateau. Dug-out fir canoes and cedar paddles enabled them to fish the lakes and gather wokas (seeds of the yellow water lily) from the marshes. Other resources included nuts, camas, the cambrium layer of yellow pine, berries, fish, ducks, geese, as well as other game animals (Cressman 1956).

The Molalla occupied a continuous territory from north to south along the western and part of the eastern slopes of the Cascades, particularly along the high ridges (Hale 1846; Powell 1891; Spier 1927; Farmer 1973; Beckham 1977; Rigsby nd; Stern 1966). The Molalla wintered in sites along streams in the lower elevations primarily west of the Cascades. During other times of the year, they exploited the higher country for roots, berries, larger game, and fish. Their basic unit was the family based upon a bilateral kinship.

The southern Molalla migrated into the Upper Willamette and Umpqua basins, possibly pushing out the Kalapuyans and Umpquas after AD 1600 (Berreman 1937; Ray 1939; Swanton 1968). Their relationships with these two groups often were hostile; their main ties being with the Klamaths. A well-defined trail, now known as the Pacific Crest Trail, in the western Cascades ran from the Klamath region to the Columbia River (Vernon 1934). This trail may well have been used by the Molalla and Klamath (Vernon 1934).

HISTORIC PERIOD

As early as the sixteenth century, European countries showed an interest in the Pacific Northwest region of North America as a potential resource area for expansion. Early visitors ranged from Spaniard Bartolome Ferrelo, under the command of Juan Cabarillo, in 1543 to Britisher George Vancouver in 1792. By 1803, the British were eliminated from the sea otter trade along the Northwest Coast, and turned their attention to the interior in search of furs. At the same time, the Americans began to move west with the Louisiana Purchase of 1803 and the Lewis and Clark Expedition of 1804-06. These efforts of the British, Canadians, and Americans in the early 1800s, primarily in the pursuit of furs, served to open the Northwest interior to rapid exploration by Euroamericans.

The Willamette, Umpqua, and Rogue drainage systems were initially a secondary fur trapping zone for the Hudson's Bay Company, Northwest Company, and Pacific Fur Company. By 1811, however, interest in the area south of the Columbia River basin resulted in an expedition up the Willamette Valley from Fort Astor led by Robert Stuart. By 1812, William Wallace and J.C. Halsey of the Pacific Fur company had established an outpost near present-day Salem and explored upstream to the source of the Willamette, possibly working their way over to the North Umpqua (Bakken 1970). Alexander Ross of the Northwest Company commissioned an expedition of 60 men in 1818. He followed the Willamette River to its source, crossed some high ridges of land (presumbably the Calapooya Divide),

and moved into the upper reaches of the North Umpqua to hunt (Ross 1956). By 1845, a decline in fur resources and a retrenchment of the Hudson's Bay Company to the north resulted in the demise of fur trapping as a dominant force in the economy of Oregon.

During the opening decades of the nineteenth century, it became apparent to the fur companies that the Willamette Valley provided the means for producing food locally to support their empires. By the 1820s, farms were established in the northern part of the Valley through the efforts of members of the fur trade in places like French Prairie.

The next wave of immigrants to western Oregon were missionaries, such as Jason Lee, who settled in the Willamette Valley during the 1830s. These people were followed by an increasing number of American immigrants coming for a variety of reasons, but primarily looking for land to farm. Initially there was enough land in the Willamette Valley for those who wanted it.

Passage of the Donation Land Act of 1850 and the Homestead Act of 1862 set the stage for a generation of settlers to file claims on forested lands in the foothills of the Cascades. This back country was desirable as a place of settlement only when the more attractive and open areas were filled. By the 1870s, the prime agricultural land in the Willamette Valley was taken and greater numbers of people moved into the foothill valleys, both as a result of the population pressure and from personal convictions.

These hill people grew their own vegetables; ran livestock; trapped; hunted; fished; and gathered native fruits, vegetables, and

herbs. In some cases, they sold some of the items they gathered to the lowlanders for extra money. The hill people used bench land to raise hay, wheat, oats, rye, fruit, and berries. They summered their livestock in pastures at higher elevations in the Cascades.

During the 1850s and 1860s, prospectors moved into the hills looking for minerals resources at places like Steamboat Creek, Bohemia Mining District, and the Blue River Mining District. Some of these people stayed year-round and others worked until the winter snows pushed them out. It was also about this time that interest in the timber resources available in the mountains began to grow in response to the increasing population in the Valley. The needs of towns like Eugene, Salem, and Portland provided impetus for the loggers who went into the region on a seasonal basis. By the 1890s, a number of people came in with the capital to invest in harvesting timberlands. Between 1890 and 1910 the industry established itself as a dominant factor in the local economy. Through the 1920s, logging in the Cascades was a seasonal venture that became year-round with the advent of trucks with internal combustion and an improved transportation network that included not only roads, but also the railroad.

At the same time the loggers and miners were utilizing the resources of western Oregon mountain areas, the valley population was also interested in the scenic foothills for recreation opportunities. People made trips into the hills to camp, fish, hike, drink soda water, hunt, bath at hot springs such as Kitson and McCredie, and swim. Hunting lodges and way stations were built to

accomodate these tourists by the hill people.

During the late nineteenth century, most of western Oregon's mountain areas were placed in the public domain ultimately under the management of the Forest Service and Bureau of Land Management. The public management of these lands has restricted the degree of population density in the area. To this day, the lands are primarily utilized for their timber and recreation resources with the permanent inhabitants primarily Forest Service employees, loggers, and those who serve the passing tourist.

SUMMARY

Western Oregon mountain areas were initially settled by Indians who followed a seasonal transhumance of hunting and gathering. The record suggests that at least one group, the Molalla, occupied a continuous territory along the Cascade slopes. Other groups, such as the Kalapuyans, moved into the mountains from the Valley floor on a seasonal basis to exploit the available resources, for spiritual purposes, and for recreation. When the Indians were supplanted by the Euroamericans, the historical record suggests a similiar scenario in the utilization of the mountain areas. Some chose to inhabit the foothill valleys on a year-round basis while others, like the miners, moved in to exploit the resources and left when these were depleted.

As has been suggested previously in this thesis, the differences between the two ethnic groups is one of scale,

technological history, and cultural applications. Both groups were hunters and gatherers who followed a seasonal transhumance life style. For both groups, the mountains became an altitudinal environment within which they chose to adapt their cultural traits unique and separate from those who remained in the lowlands.

VII. CALAPOOYA DIVIDE ENVIRONMENTAL OVERVIEW

PHYSIOGRAPHY

Approximately 60 million years ago, a volcanic formation developed along what is now known as the Pacific Northwest coastline. This formation consisted of the Coast Range-Klamath Mountain block, and on its eastern edge, the Cascade Mountain Range. During a series of volcanic episodes in the Eocene, Oligocene, and Miocene epochs between 50 million and 15 million years ago (see Figure 5), the Cascades assumed their contemporary alignment (Hammond 1979).

The volcanic episodes that created the Cascades laid down deposits of basalts, andesites, and pyroclastic rocks. These deposits built a plateau, in places over 10,000 feet thick, dotted with volcanoes, cinder cones, and sheets of lava (Purdom 1964). At the end of the Miocene (about five million years ago) tectonic movements occurred in the earth's crust that uplifted, folded, and tilted the Cascades (Purdom 1964). This uplifting occurred into the Pliocene epoch (between five million and two million years ago) along the axis of the present High Cascades. According to Baldwin (1981), uplift of the Cascades region was negligible in the developmental processes that built the contemporary topography of the region. He suggests, rather, that volcanic upbuilding of the High Cascades during the last five million years, i.e., the Pliocene, Pleistocene, and Holocene epochs, served to create most of

AGE DIVISIONS			TIME			
ERA			DURATION IN MILLIONS OF YEARS			BEGINNING MILLIONS OF YEARS AGO
	PERIOD	EPOCH	ERA	PERIOD	EPOCH	
CENOZOIC	QUATERNARY	RECENT		1		
		PLEISTOCENE			1	1
	TERTIARY	PLIOCENE	63	62	12	13
		MIOCENE			12	25
		OLIGOCENE			11	36
		EOCENE			22	58
		PALEOCENE			5	63

Figure 5. Geologic time chart (after Baldwin 1964)

the contemporary topography.

Geologists divide the Cascade Mountain Range (see Figure 6) into two distinct physiographic areas--the western Cascades and the High Cascades (Baldwin 1981). Of the two, the western Cascades are older, comprised primarily of andesite, basalt, and rhyolite from the Eocene, Oligocene, and Miocene epochs. The High Cascades consist of peaks and lava flows of the younger Plio-Pleistocene time frame (see Figure 5).

The Calapooya Divide lies in an east-west alignment within the western Cascade physiographic province (see Figure 7). As such, the Divide reflects the stratigraphic formations and topography of the western Cascades. The defining features of the Calapooyas do not appear to have any regular pattern and are therefore difficult to differentiate from the rest of the province. With the exception of Smith (1938), geologists rarely describe the Divide as a unique feature of the western Cascades, but use such regional categories as the Willamette River Section, the Row River Section, and the Umpqua River Section (Baldwin 1981).

The Calapooya Divide has been influenced geologically by the processes responsible for creating the High Cascades. During the Pliocene, an uplift that occurred on the axis of the High Cascades also drew the western Cascades with it. In places, lava flows and ash from volcanic episodes poured on the western Cascades or into the valleys as intracanyon flows (Baldwin 1981). Ash from Mount Mazama appears as far west as Toketee Falls to depths of six inches (Purdom 1964).

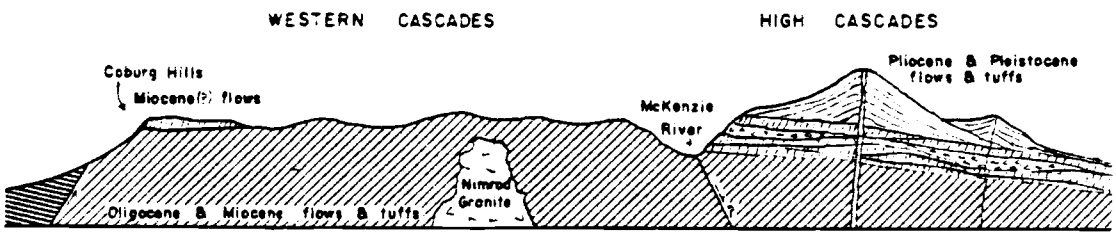

Figure 6. Cascade physiographic province (Baldwin 1964:59)

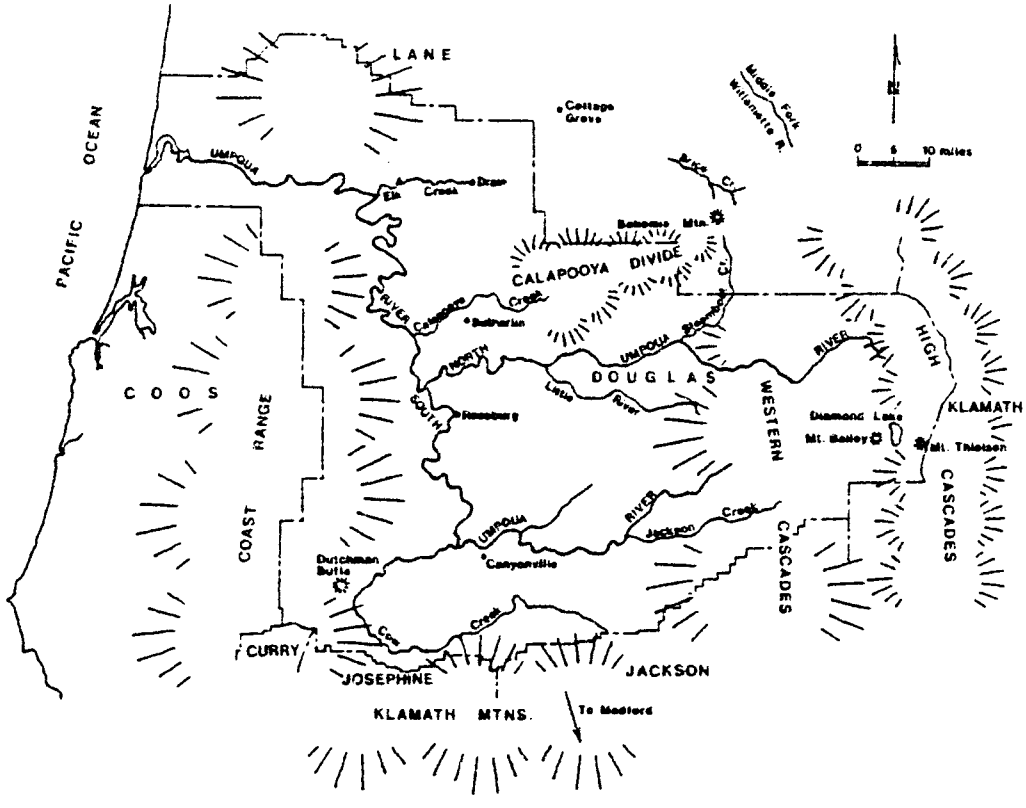

Figure 7. Calapooya Divide

Numerous stratigraphic layers of pyroclastics (tuffs, breccias, and agglomerates), andesites, and basalts from various volcanic episodes comprise the Calapooya Divide. These rocks frequently occur in complex patterns with local variations. Though variations occur, the stratigraphy remains consistent with volcanic layering and names have been assigned to describe each general formation (see Figure 8). Geologists frequently refer to the initial layer of andesites, tuffs, and breccias in the Divide as the Colestin Formation (Wells 1956). Fossil remains date the Colestin to be of late Eocene origin. During the Oligocene, this layer was overlain by the Little Butte Volcanics. Some 3,000 to 15,000 feet thick, the Little Butte Volcanics are composed primarily of pyroclastics with andesites and basalts also observable. The next layer in the Calapooya Divide is referred to as the Sardine Formation from the Miocene epoch. It contains 3,000 feet of andesitic lavas, tuffs, and breccias. Sedimentary deposits along the Calapooya Divide laid down since the Sardine Formation consist primarily of sands, gravels and silts, and local glacial debris from the Plio-Pleistocene epoch.

A unique phenomenon of the late Miocene is significant in the geological history of the Calapooya Divide. During the volcanic episodes that created the western Cascades, a group of igneous rocks were created that had large crystals set in a finer ground mass. These porphyritic rocks occurred as dikes, stocks, and plugs clustering in specific areas. Alteration of the rocks during dioritic intrusion and vein emplacement created such minerals as

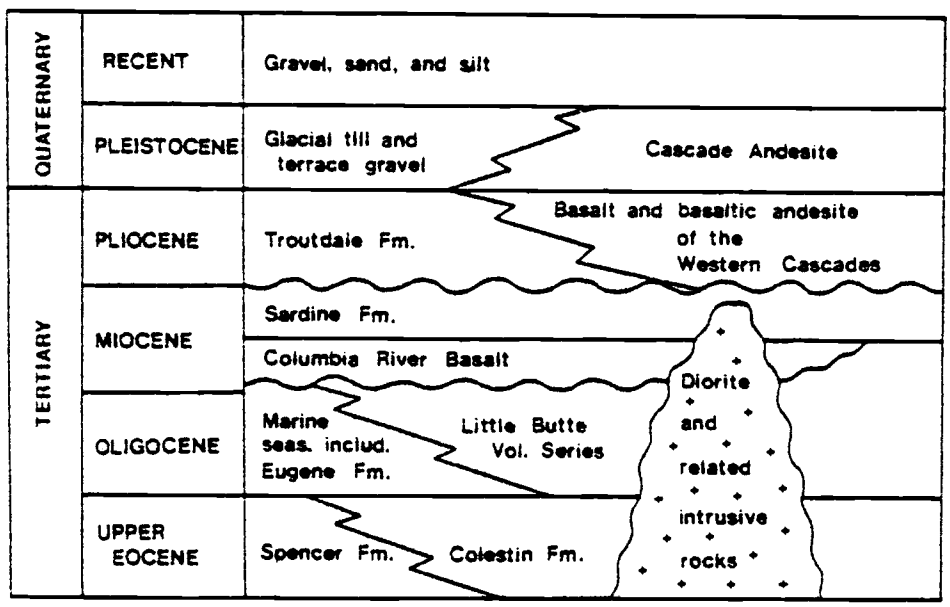

Figure 8. Geologic formations in western Oregon

quartz, gold, and silver within the clusters. Where these intrusive rocks occur along the Calapooya Divide, they tend to coincide with mineralized areas like the Bohemia Mining District.

Volcanic activity in the western Cascades created two basic groups of rocks from which the area's soils are derived (Franklin and Dyrness 1973). Pyroclastics (breccias and tuffs) are characterized by a fine texture with deep layers. They generally tend to be a clay loam that retains large amounts of water, becoming unstable as a result. Basaltic and andesitic soils are a coarser texture that drains water such that they are not susceptible to movement. These soils tend to be a sandy loam. Soil types along the Calapooya Divide vary with location, geologic feature, and elevation. Rock outcrops along the Divide that derive from andesites or basalts usually have a depth of soil and organic materials less than three inches, as do those of pyroclastic origin. On steep to very steep tuffaceous slopes the depth of the soils is usually less than three feet, varying with the terrain. Soils range from gravel to clay loams covered by forest duff. On the more gentle to steep slopes, soils are also less than three feet deep, depending upon the terrain. Clay and cobble loams make up the subsoils, while gravel and/or gravelly loam comprise the soils. These are covered by forest duff as well.

During the Pleistocene epoch, glaciation occurred along the Cascade Range affecting the area geologically. Glaciers spread from the peaks of the High Cascades into the western Cascade province. They caused erosion, depressed the land under their weight, left

behind soil and debris, and created depressions that are now lakes. Along the Calapooya Divide, dikes, cirques, and modified higher walls of valleys from glaciation are readily apparent (see Figure 9). Strong evidence of glaciation appears along the Divide at Bulldog Rock, Pyramid Rock, Bristow Prairie, and Ranger Prairie (U.S. Government 1978). Glacial lakes and bogs, such as Loletta and Bradley lakes, occur intermittently at higher elevations (Callaghan and Buddington 1938; Gray 1978).

HYDROLOGY

As an upfolding in the western Cascades, the Calapooya Divide provides a natural barrier between the Willamette and Umpqua drainage basins. The northern flank of the Divide serves as a sub-basin for the Willamette River and the southern as a sub-basin for the Umpqua River. The streams originating along the Calapooya are characterized by a dendritic pattern of drainage. Features associated with this type of hydrology include steep, narrow stream valleys bordered by high sloping ridges.

Major tributaries of the Middle Fork of the Willamette River include Staley and Coal creeks. On the south, the North Umpqua is primarily fed by Steamboat and Boulder creeks. Feeder streams for these major creeks and additional smaller creeks are significant in the hydrological system as well.

Water levels in the network of streams along the Calapooya Divide are influenced by soils, vegetation, gradient, and other

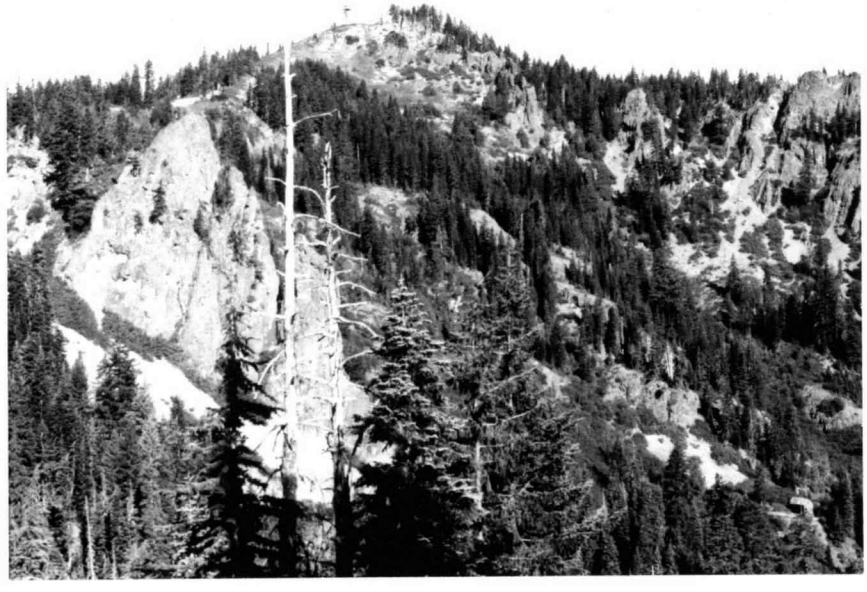

Figure 9. Glacial cirque in Champion Basin looking toward Fairview Mountain (Callahan and Buddington 1938:39-40)

features. The intensive streamflows that occur fluctuate seasonally, with the greatest flows in December, January, and February when snow falls and rapidly melts at the lower elevations. High flow also occurs during the early to late spring when the deep snowpack melts. The lowest levels of the year are in summer and autumn. Most of the feeder streams, even though they drop in level, are perennial.

CLIMATE

Scientists suggest that, since its creation millions of years ago, western Oregon has had a relatively temporate climate, probably moderated by Pacific Ocean currents (Baldwin 1981; Hansen 1947). Scientific hypotheses concerning climatic conditions prior to 1850, and Euroamerican historical records, are based upon information from such fields as palynology, glaciology, geomorphology, and geochronology. Research in glaciology indicates that "relatively low annual average temperature and high precipitation are coincident with glacier advance and the converse of these conditions prevails during retreat" (Heusser 1960:33). Pollen released into the atmosphere eventually settles on the earth's surface, essentially becoming a part of the accumulating sediments. If conditions are favorable, it may be preserved indefinitely. When analyzed, the pollen will suggest the floral community at a given time. This in turn suggests the climatic environment, since plants tend to grow in environments that fit their needs. Using dated glacier variation

and forest succession, researchers can deduce climatic change.

During the 1940s, Henry P. Hansen utilized data from pollen studies in the Oregon Cascades to propose the following framework for climatic change in the Cascades since the retreat of Pleistocene glaciers:

Period I	last glacial maximum to 15,000 BP
Period II	lasted from 15,000 to 8,000 BP with a transition from cool and moist to warm and dry conditions, with the latter stages similiar to today
Period III	lasted from 8,000 to 4,000 BP with maximum warmth and dryness reducing the volume of lakes and rivers and potentially drying up smaller streams
Period IV	4,000 BP to date, with conditions cooler and moister, similiar to the present.

Other scientists have worked with climatic changes over time that involve the Pacific Northwest coast. They label Hansen's Period II as Anathermal (Antevs 1948; Cooper 1958) or Early Postglacial (Heusser 1960). Period III is also known as the Hysithermal (Cooper 1958), Altithermal (Antevs 1948), or Middle Postglacial (Heusser 1960). Researchers variously label Hansen's Period IV as Hypothermal (Cooper 1958), Midithermal (Antevs 1948), or Late Postglacial (Heusser 1960). Subsequent data from future research may or may not substantiate the validity of these climatic models.

Geologists have documented a number of minor glaciations that have occurred since AD 1250. The data from these advances and

retreats suggest that a relatively ameliorated climate existed between AD 1250 and the early 1600s. After AD 1650, a greater coolness and precipitation prevailed with minor fluctuations until about AD 1850. followed by a warming and decrease in precipation (Heusser 1960).

The western Cascade physiographic province, including the Calapooya Divide, provides a major influence on the climate of western Oregon. Contemporary researchers assign four phases in what they designate as a maritime climate that pertains to the Calapooya Divide (Lahey 1979). These include wintertime, springtime, summertime, and autumn climatic distinctions. Heavy precipitation in the form of rain or snow characterizes the winter phase. Annual temperatures tend to be lower than other geographical areas in Oregon. Spring usually brings a 30 percent reduction in precipitation that becomes primarily rain. Summer represents a large reduction in precipitation with a rise in temperatures. During autumn, precipitation again rises, with a drop in temperatures to near freezing. The summit of the Calapooya Divide (4,000-6,000 feet) is assigned to the climatic zone known as the Cascade Zone (Loy 1976). Precipitation at this level of the Divide averages some 80 inches, primarily in the form of snow. Winter temperatures average 25 degrees to 35 degrees Fahrenheit while summer temperatures tend to be 55 degrees to 65 degrees Fahrenheit. Specific climatic data for upper reaches of the Divide are not available because most weather gauging stations, such as Dorena and Steamboat, are below 2,000 feet and therefore do not reflect the

weather at the upper elevations.

VEGETATION

Pollen studies and flora that persist in a given area as a survival from an earlier period or type provide researchers with a record of plant succession in the Cascades for the last 20,000 years (see Figure 10). The limited records currently available necessarily must temper interpretations of plant succession at this time. Subsequent research data may or may not substantiate the models developed by such scientists as Henry Hansen (1947) and LeRoy Detling (1968).

During the last glacial maximum of the Pleistocene epoch, a forest of lodgepole pine and western white pine extended along the ice front in Washington, reaching as far south as the Calapooya Divide in Oregon (Detling 1968). Lodgepole pine continued to dominate the flora community along the Cascades until about 13,000 years ago in response to the cooler and wetter climate that persisted from the Pleistocene. Detling (1968) suggests that the trees and underbrush of this lodgepole pine forest are similar to forests between 4,500 and 5,500 feet elevation along the contemporary Cascades.

About 13,000 years ago (Period II), yellow (Ponderosa) pine began to expand in the region in response to warmer and drier climatic conditions, and lodgepole pine began a decline (Hansen 1947). Detling (1968) suggests that yellow pine and oak occupied

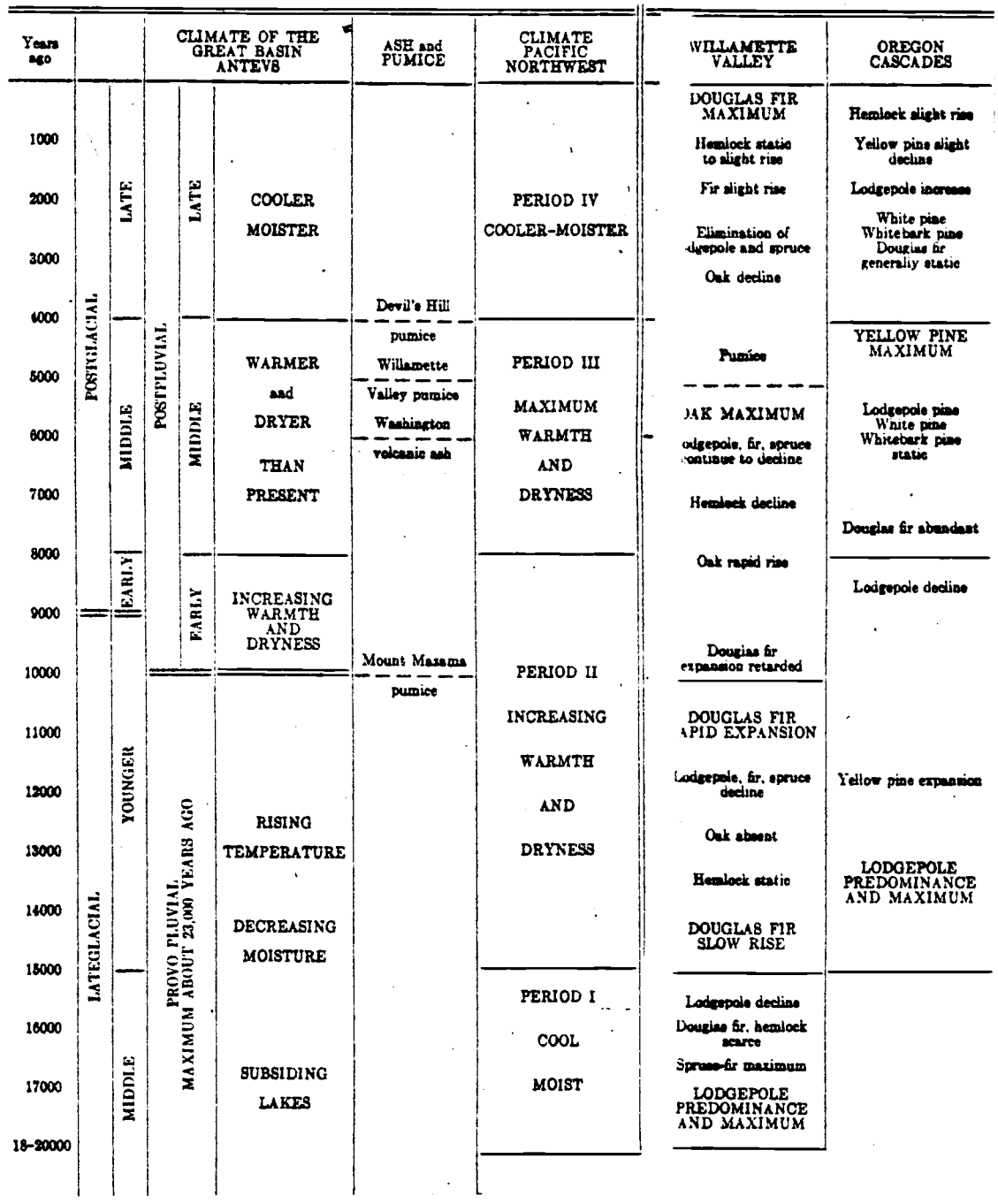

Figure 10. Postglacial climate and forest succession (Hansen 1947:114-115)

warm, open areas to elevations of 5,000 feet in the Cascades. Between 8,000 and 4,000 years ago (Period III), the yellow pine became the dominant flora community except where pumice existed from Mount Mazama. It is in those areas that Hansen (1947) refers to an immediate dominance of lodgepole pine in response to the pumice mantle and resultant sterile soils. Beginning about 4,000 years ago (Period IV), the climate again became cooler and moister. Lodgepole pine in the Cascades increased in numbers while yellow pine declined. Hemlocks also experienced an increase, along with western white pine.

Little information in the available published literature suggests any appreciable changes in vegetation along the Calapooya Divide during the last 4,000 years. Due to the incursion of Europeans into the region, it is possible to reconstruct nineteenth century vegetation with some degree of precision from early maps and travel accounts. Langille (1903) in his survey of the Cascade Range Forest Reserve noted large numbers of redfir, hemlock, noble fir, lovely fir, yellow pine, white pine, and cedar along the Calapooya Divide. These coniferous forests were confined primarily along the higher, steeper slopes of the Divide. Hemlock, rhododendron, and greasewood were common in the burned-over areas.

From his work with historic records, Towle (1979) suggests that savanna, i.e., a mixture of prairies and scattered trees (primarily oak), extended to elevations of 2,000 feet up the Middle Fork of the Willamette. This savanna was maintained through deliberate burning by the Indians. After Euroamericans settled the

area, a reduction in frequency and extent of fires occurred that resulted in replacement of the savanna by the contemporary Douglas fir forest. As a result, the lower boundary of the forest ecosystem dropped in elevation.

Contemporary flora communities along the Calapooya Divide are fairly static, with some local variations. These variations may result from macro-climatic phenomena, soils, fire, or volcanic ash. After the influx of Euroamericans, years of logging altered environmental conditions that in turn affected the response of local flora communities. Nonetheless, certain types of flora predominate the Divide in relationship to elevation, moisture, and soils.

Franklin and Dyrness (1973) assign two flora zones to the western Cascade physiographic province that apply to the Calapooya Divide. The Western Hemlock Zone lies between 500 and 5,000 feet in elevation. Pacific silver fir dominates the flora community between 3,500 and 5,500 feet.

The northern side of the Calapooya Divide is characterized above 4,800 feet by the presence of white pine, Shasta red fir, silver fir, Douglas fir, and incense cedar. Below 4,000 feet, sugar pine, white fir, and grand fir occur. Understory vegetation varies with terrain and moisture. Fern, salal, Oregon grape, trailing blackberry, oceanspray, vine maple, and Pacific rhododendron occur in the cool, moist areas. Drier exposures include manzanita, elderberry, fireweed, poison oak, Pacific madrone, and oak (Horn 1972).

The macroflora on the southern side of the Divide, at altitudes above 3,800 feet, includes mountain hemlock, Shasta red fir, western white pine, lodgepole pine, and some Engelmann spruce. Ground cover at these elevations tends to be sparse and consists of huckleberry, pinemat, manzanita, and common beargrass. Below 4,000 feet, Douglas fir becomes the dominant species with white fir, western hemlock, yellow pine, white pine, western red cedar, sugar pine. and incense cedar also present. Understory vegetation occurs as golden chinquapin, ceanothus, manzanita, oceanspray, trailing blackberry, salal, Oregon grape, vine maple, and huckleberry (U.S. Government 1978).

FAUNA

Information available in the published literature discussing animal life in the western Cascades during the late Pleistocene is elusive. Paleontological studies suggest that musk ox, mammoth, reindeer, bison, horse, and bear lived in the Pacific Northwest during the Pleistocene. A number of these species are now extinct. Information concerning their presence in the Cascades is limited to nonexistent, due to the soils which cause rapid decomposition from a high acid content. Paleontologists indicate that most species present in the Northwest today are descendents of late Pleistocene forms.

Numerous contemporary species of animals live along the Calapooya Divide, varying in habitat and range with physiographic

features and climate. Vernon Baily (1936) developed a zonal model for categorizing faunal types and distributions in Oregon that includes:

1. Sonoran
2. Transition
   a. coastal strip
   b. humid division
   c. semi-arid
   d. arid
3. Canadian
4. Hudsonian
5. Arctic-Alpine

Of these, the humid division of the transition zone, ranging in altitude from sea-level to 4,000 feet, applies to the Divide.

The stability of fauna within Baily's humid division varies. Overlapping of species occurs at the highest and lowest levels of the zone. Transhumant species occupy given localities on a seasonal basis. With the advent of Euroamericans into the area, the range and habitats of the various species gradually altered due to increasing population and resulting land use practices. Settlers ran sheep and cattle in the mountain meadows, competing for available forage land with elk and deer. Logging practices have altered extensive amounts of animal habitats. Nonetheless, fauna and avifauna listed in Tables 1 and 2 represent characteristic contemporary populations along the Calapooya Divide.

Table 1. Fauna of the Calapooya Divide

Beaver	Black Bear
Coyote	Ringtail Raccoon
Shrew (four species)	Marten
Shrew-Mole	Fisher
Vole (four species)	Weasel (two species)
Deer Mouse	Mink
Woodrat (two species)	Badger
Snowshoe Hare	Mountain Lion
Mountain Beaver	Bobcat
Townsend's Chipmunk	Roosevelt Elk
Squirrel (four species)	Mule Deer
Porcupine	Columbian Black-Tailed Deer
Wolf (extinct from this area)	Fox (two species)

Table 2. Avifauna of the Calapooya Divide

Goshawk
Woodpecker (five species)
Owl (eight species)
Duck (two species)
Hawk (four species)
Heron (two species)
Merganser (two species)
Turkey Vulture
Eagle (two species)
Common Flicker
Yellow-Bellied Sapsucker
Flycatcher (three species)
Western Wood Peewee
Swallow (two species)
Jay (two species)
Common Raven
Common Crow
Clark's Nutcracker
Chickadee (three species)
Nuthatch (two species)
Brown Creeper
Dipper
Quail (two species)
Osprey
Peregrine Falcon
American Kestral
Grouse (two species)
Band-Tailed Pigeon
Mourning Dove
Vaux's Swift
Rufous Hummingbird
Belted Kingfisher
Water Wren
American Robin
Thrush (three species)
Townsend's Solitaire
Kinglet (two species)
Warbler (three species)
Brown-Headed Cowbird
Western Tanager
Grosbeak (two species)
Purple Finch
Pine Siskin
Red Crossbill
Dark-Eyed Junco
Other migrant species

VIII. THE CALAPOOYA DIVIDE AS A CULTURAL SYSTEM

PREHISTORIC PERIOD

Archaeological work along the Calapooya Divide is of a limited nature, consisting of recent site testing and surface reconnaissance. This weak state-of-the-art, plus minimal ethnographic materials, creates a situation whereby the prehistory of the Divide is virtually unknown. Prehistoric cultural patterns of adjacent regions only suggest possible patterning for the Calapooya Divide, and the Rogue-Umpqua Divide to the south. An analysis of what is known about these patterns can be useful in developing research hypotheses about the cultural role of the Divide in Oregon's prehistoric past.

Penetration of humans into the area of the Calapooya Divide could have occurred as early as 12,000 BC. These people would have exhibited the cultural characteristics of the early Paleo-Indian or the specialized big game hunting (Llano or Folsom) traditions found in many areas of western North America. Work by Newman and Scheans (1966) suggest such a possibility in the South Umpqua drainage.

By 6,000 BC, the archaeological record suggests that an early form of adaptation to upland regions was occurring along the Rogue (Davis 1980) and North Umpqua (Brauner and Honey 1977). This adaptation of a hunting and gathering peoples to the resources of a riverine headwaters is illustrated by a tool kit of uniquely riverine upland tools appropriate to the western Cascades

(Honey 1980). The kit included notched points, keeled end scrapers, and milling stones (Davis 1974). The presence of these early people along the Divide is undocumented, but there is ample reason to suggest that they moved into the area in a seasonal transhumance based upon hunting and gathering. The current lack of archaeological information precludes suggesting anything further than such a seasonality of usage by an early upland people.

Between 2,500 BC and AD 1600, a number of innovations in the lithic technology occurred which provided upland peoples with a greater facility in their quest for food through fishing, gathering and hunting activities. These tools included mortars, pestles, micropoints, stemmed points, and scraping and incised tool complexes. The archaeological record suggests that river and stream terrace sites were probably seasonal fishing camps while more permanent settlements were in protected areas at higher elevations in the river valleys and near a permanent water supply (Davis 1974).

Between 1,500 and 500 BC, Athabaskans moved out of Canada, through the Plateau and Great Basin, and into the Southwest. Along the way small groups broke off to move through the Cascade Mountains and down such drainage systems as the Umpqua and Rogue. They are known for their adaptability to new environments though they leave behind no unique diagnostic tool kit. Their distribution pattern suggests domination of upland areas and consequently they may have lived in the area of the Divide (Honey 1980).

Very little scholarly work has been undertaken to assess the aboriginal population movements and intertribal-band relationships

in the area of the Divide. Tribes of the inland and upland areas portray north-south ties while those of the lower rivers and coastal region are varied. It therefore follows that the area of the Divide cannot be considered an isolated cultural province (Honey 1980). Indian groups in the area at white contact included Kalapuyans, Yoncallas, the Umpqua, Athabaskan, Klamath, Molalla, and possibly the Takelma. How and to what degree these groups utilized the Divide can only be suggested from the ethnographic record and the limited archaeological research.

As part of a cultural resource evaluation conducted in the Bohemia Mining District (Honey and Kaiser 1980), researchers sank test pits at a site northwest of Johnson Meadows. They found projectile points of similiar typology to those in the Willamette Valley and northern Great Basin. The test nature of the site did not lend itself to conclusions about the period of occupancy. The similarities these artifacts show with those of the Valley and Great Basin strongly suggest that upland peoples of both of those zones either traversed the Divide or traded with its more local inhabitants.

The cultural survey of the Divide completed by Oregon State University in 1980 located ten prehistoric features in varying degrees of preservation (Starr and Honey 1981). The sites were predominately in saddle areas, and cultural materials associated with them included lithic tool fragments and chipping debris. Cairn sites discovered during the survey occurred on knolls and mountain crests. These sites were not tested. Consequently it is not

possible to make conclusive statements. The presence of these sites does lend strong support to the presence of Indians along the Divide at its higher elevations.

The Kalapuyans occupied the upper Willamette Valley and its tributaries, including the Middle Fork of the Willamette. To the south, the Yoncalla, classified as Kalapuyan speakers, lived above Elk and Calapooya creeks in what is now Douglas County. These Kalapuyan speakers were semi-nomadic, patrilineral bands who traded with adjacent cultural groups (Collins 1951; Jacobs 1945; Mackey 1974).

The Kalapuyans' subsistence pattern included a seasonal transhumance that moved from valley floor to hillside (White 1975; Towle 1979; White 1981; Beckham 1981). It is reasonable to presume that part of that round may well have included the Divide. White (1975) suggests that the Kalapuyans occupied the valley edges at the Douglas fir ecotone to engage in hunting, tool manufacturing, and hide preparation during the late spring and summer. Minor suggests similiar use of upland areas until late prehistoric time (Beckham 1981). Given what is known about the fluctuation in elevation of the flora community over time (Detling 1968; Hansen 1947; Towle 1979), the location of summer sites may well have occurred at fairly high altitudes along the Divide. Further research is needed to test such a possibility, particularly when reference is made to Indian camps at Camper's Flat and along the Calapooya Trail as late as the early 1900s (McFarland 1940).

The Kalapuyans not only sought valley edge sites for food and tools, but also viewed the mountains as a place where the guardian spirit powers of their religion tended to reside. As part of their rites of passage into adulthood, the Kalapuyans would go out into the hills where they would build a fire and put a great many rocks on it (Jacobs 1945). A number of rock cairns exist along the Divide on knolls and mountain crests. Some features are triangular, some linear, some semi-circular, and others are parallel (see Figure 11). Some cairn sites appear to have a panoramic orientation to Mounts Thielsen and Baily near Diamond Lake (see Figure 12).

Loendorf (1973) in his work on the Pryor Mountains was very careful to avoid the supernatural as a factor for assessing archaeological sites because he had no scientific basis upon which to establish a statistical key. The role of rock cairns in Native American culture has not been completely established. A review of the literature suggests that cairns have been used to mark trails, locate resources, and reflect heat in addition to their religious purposes (Glynn 1973; Galm and Hartman 1979). Further research is needed concerning cairn sites along the Divide before conclusive statements can be made about their actual purpose. It is possible to suggest, however, that some of these cairns may well be a result of Indian religious activities.

The ethnographic record indicates that the Divide was also used by other groups in western Oregon including the Klamath, Umpqua, Takelma, Athabaskans, and Mollala. It is reasonable to suggest that those who lived in the area also pursued activities

Figure 11. Rock cairn (Site 35 DO 195) with orientation to Mounts Thielsen and Baily

Figure 12. Mounts Thielsen and Baily

similiar to those of the Kalapuyan speakers in their use of the Divide. Others further away likely used it as a route of travel for purposes of trade or warfare with local inhabitants.

Just prior to white contact a network of trade, raiding, and other interactions linked people from the Columbia River to the Klamath River. The Calapooya Divide lies in an east-west alignment between the Coast Range and the Cascades. Several ridges run up to the crest of the Divide facilitating travel (see Figure 13). From there it is possible to move into the Umpqua drainage system or east to the Cascades. Cressman (1977) suggests that the Calapooya Divide was a major route linking Klamath country with the Willamette Valley. This conclusion is supported by the network of aboriginal trails that covered the Divide at white contact (see Figure 14). Some of these trails included the Staley Ridge Trail; the trail that became the Oregon Central Military road; the system from Camper's Flat through Fish Creek Valley to Crater Lake, later known by the Forest Service as the North South Trail; the trail that went by Summit and Crescent lakes; Steamboat Creek; Salt Creek; and the Calapooya (Huntington nd; Morris 1905; Williams 1863; McFarland 1940).

Based upon available archaeological information, observation of physiographic features, and the ethnographic record, it is reasonable to presume that the Divide was utilized in the aforementioned ways. The current lack of archaeological information precludes suggesting anything further than a seasonality of useage, a possible place for religious purposes, and as a route for travel

Figure 13. Ridge up to the Calapooya Divide

Figure 14. Trail along the Calapooya Divide near the Bohemia Mining District

between the Willamette and Umpqua drainages as well as with the Great Basin and Plateau. It is the historic period which provides the best evidence for cultural patterning in the Calapooya region. The historical record reflects those patterns of usage suggested for the prehistoric past including food gathering, religious purposes, and a route of transportation. The record is one of cultures in contact, however, and is therefore subject to many early period prejudices and inaccuracies of description.

During the early 1800s, Euroamericans began moving into the Willamette Valley. By mid-century, settlements were developing along both the Middle Fork of the Willamette and the North Umpqua rivers. Initially Indians and settlers in both sub-basins lived as neighbors, with occasional skirmishes. The horse, acquired at white contact, enabled the Klamaths to travel over the Calapooya Divide via Staley Ridge and down the Middle Fork to Pleasant Hill. There, in 1848, they engaged in hostilities with a group of white settlers led by Elijah Bristow (Walling 1884b). The Klamath did not limit their hostilities to the Euroamericans and often engaged the Kalapuyans as well (Cottage Grove Sentinel 1919). A year later, Klickitats from north of the Columbia River passed through the Upper Willamette on a hunting expedition. An altercation developed between them and Elijah Bristow at his place in Pleasant Hill (Walling 1884b).

Large numbers of Indians travelled into the upper reaches of the Middle Fork of the Willamette through the pass south of Diamond Peak as part of a seasonal transhumant pattern of hunting and

gathering that lasted into the twentieth century. They followed tableland and ridges leading to Bear Mountain, then to Juniper Mountain, over Juniper Ridge to Logger Butte, and on to Warner Mountain. They ended up at Camper's Flat, an area used frequently by the Indians until 1910 (McFarland 1940). Before extensive Euroamerican settlement in the area, the Indians would leave Camper's Flat via the mouth of Staley Creek, travel past Dome Rock, and then to the Calapooya Divide. They gathered food along the Divide as far west as Hardesty Mountain, returning to eastern Oregon via Little Cowhorn Mountain (McFarland 1940). The Indians left behind remnants of their camps such as the one utilized by the Warm Springs, until the early 1900s, between Bristow Prairie and Hills Peak about one-quarter mile east of the junction of the Staley Ridge Trail (McFarland 1940).

By 1855, most of the Indians remaining in the area were moved to reservations at Grand Ronde and Warm Springs. They continued, however, to utilize the Divide for various purposes, such as gathering food and meeting socially at the hot springs and Cap's Illahee Flat. It is also possible that the groups continued their vision quest practices, as suggested by a number of rock cairns in the area such as those in the vicinity of Balm Mountain. The Indians also continued to use the Divide as a route of travel between eastern and western Oregon in order to work the hop fields around Eugene and to trade goods until at least 1912.

HISTORIC PERIOD

Alexander Ross' expedition into the Willamette Valley in search of furs formalizes the beginnings of white exploitation and utilization of the Calapooya Divide for its resources and as a route of travel between the Willamette and Umpqua valleys. It also marks one of the first recorded encounters between Euroamericans and Indians in the area of the Divide. Ross (1956) found that while the Indians had no objection to the Euroamericans trapping they preferred to minimize their interaction with the whites. Available sources suggest that the Umpquas and Kalapuyans did little trapping of their own and had only a handful of furs to trade (Bakken 1970; Ratcliff 1973; Ross 1956).

Free trappers, mostly French Canadians, initially worked the region and may well have spent time in the headwaters of the Willamette and Umpqua rivers. Expeditions under the auspices of the Hudson's Bay Company regularly moved through the Willamette-Umpqua basin. Because it was easier to ford the smaller Rickreall or Mary's River than the Santiam or Middle Fork, the fur company's traffic was greater along the western foothills than the eastern side of the Valley (Smith 1963).

In order to pass into southern Oregon, the fur trappers established a pack trail over the Calapooya Divide between the headwaters of the Siuslaw and Pheasant Creek Valley in Douglas County, later part of the Applegate Trail (Smith 1963). Some investigators (Minor 1977) suggest that during these annual treks

major explorations were made up both the Willamette and Umpqua drainage systems, possibly moving east from the Company's north/south pack trail. Major trail systems, initially established by the Indians, existed up both sub-basins that would have expedited the movement of such explorations into the area.

Early settlers in the upper reaches of the Willamette and North Umpqua rivers found few of the niceties afforded their contemporaries along the eastern seaboard. They learned to utilize the resources available to them in an environment where communication with the outside world was primarily limited to the dry season. As in other parts of the world, these mountain people would exploit their environment for those resources that they could use or sell to the outside world. For example, almost every farmer in the area set traps to catch fur-bearing animals (Jensen 1970).

In order to survive in the rigorous mountain environment, Elijah Bristow and other settlers would engage in transhumance by belling their cattle and summering them on the Calapooya Divide at Bristow Prairie and other places (Huntington nd). To gain access to the Divide, they widened Indian trails for the herds of livestock such as the trail from Camper's Flat to Bristow Prairie (Huntington nd).

The available literature does not indicate that any year-round agriculture was practiced along the Divide proper, probably due to a number of factors including weather, the scattered pattern of the small tracts of potential agricultural land, and distance to markets (Langille 1903). Instead most people lived in

the river valleys at places like Oakridge and Pleasant Hill. Records do indicate several cabins existed on the Divide such as McClaim's at Bristow Prairie (Morris 1905). These were probably utilized for temporary settlement or to accommodate settlers who used the area at least annually to pick huckleberries at places like Johnson Meadows (Huntington nd).

After the gold rush to Jacksonville in the 1850s, prospectors moved into the upper reaches of the Rogue, Willamette, and Umpqua drainage systems. Along the Calapooya Divide, gold mining began at Steamboat Creek by the 1850s and in the Bohemia Mining District in 1863. Miners moved into the area along old Indian trails that ran up the North Umpqua to Steamboat Creek and then up Steamboat Creek to the crest of the Divide (Williams 1863). The available literature does not indicate any other significant mineral finds along the Divide proper, but it is reasonable to presume that prospectors explored essentially all the streams in the sub-basins using pans and other placer mining techniques (Honey 1980). Within a few short years, the surface gold was gone. Miners continued to prospect in the area until after the 1900s. Their efforts helped open the Calapooya Divide to further resource utilization.

In 1863, L.L. Williams was commissioned by Roseburg merchants to survey the upper North Umpqua for its development potential. His route followed Indian trails up the North Umpqua to Steamboat Creek, along Steamboat Creek to the Calapooya Divide, then east to the Dalles-California Road. It was not until 1922 that development of a road system began along the North Umpqua, unlike

the Middle Fork of the Willamette. Between 1864 and 1867, Byron J. Pengra and his associates surveyed and built the Oregon Central Military Road through Willamette pass. As a result of the road (later known as the Rigdon Road), the Upper Willamette became more accessible. Settlers transferred their shareholder land grants into farmsteads. Some built hunting lodges initiating utilization of the area for recreational purposes (Jensen 1970).

By the 1870s, interest in the economic potential of the timber available in the Cascades resulted in utilization of the Middle Fork and North Umpqua to drive logs to mills in the Eugene and Roseburg areas (Bakken 1970; Mason 1973). Log driving reached its peak between 1890 and 1910. As supplies became exhausted the loggers moved upstream to such places as Fall Creek, Winberry Creek, and the North Fork of the Middle Fork. Contract loggers, such as Jasper Hills, and the Oregon Boom & Timber Company figured prominently in the activities. Logging activities did not reach the Calapooya Divide until the 1890s (Bakken 1970). By 1912, the river drives had been replaced by the advent of the logging railroad and the lack of available timber near the driving streams.

In 1893, the Cascade Range Forest Reserve was established under the auspices of the U.S. Department of Interior. The Reserve covered a large portion of the Cascade Range, including the Calapooya Divide (Williams 1981). Initially it was a closed area, but by 1897 the land was reopened to settlers, miners, stockmen, and lumbermen for their use. In order to enforce the regulations of the U.S. Department of Interior and later the U.S. Department of

Agriculture in 1905, forest rangers were hired to patrol the area. Addie L. Morris served as the ranger for the Upper Willamette area from 1899 to 1905 (Jensen 1970). Cy J. Bingham also worked in the Upper Willamette between 1903 and 1905 (Jensen 1970). In 1904, Carl Henry Young was appointed the first resident forest ranger for the Bohemia Mining District (Fortt 1971). Rangers working in the area of the Calapooya Divide engaged in activities that included patrolling, acting as game warden, surveying, erecting cabins, trail building, timber marking, log scaling, locating sites for mills and hotels, fire fighting, and being a deputy U.S. Marshal (Fortt 1971; Jensen 1970; Morris 1905).

In the early days, one ranger had literally hundreds of thousands of acres to patrol. Among the many duties, fire control played an important role. It was the rangers' responsibility to find and suppress fires such as the one at Johnson Meadows in 1919 that covered 420 acres (U.S. Government nd). Building and improving the trail systems also occupied a significant portion of their time. Circa 1902, they developed a trail system that left the main road along the Middle Fork at Simpson Creek, went up Coal Creek, connected with a trail from Bohemia Mountain, followed the Divide around the east side of Steamboat Creek, and connected with the North Umpqua at its junction with Steamboat Creek (Langille 1903). The rangers used it to travel between the Willamette and Umpqua valleys.

During the late 1800s and early 1900s, the Federal Government engaged in public land surveys in Oregon under the jurisdiction of

the U.S. Surveyor General (Stout 1968). The surveys were initiated through the Surveyor General's office or in response to requests by settlers desiring land under the Homestead Law. It was through such efforts that the sections and quarter-sections covering the Calapooya Divide were established.

Homesteaders in the upper reaches of the sub-basins and eastern Oregon continued to summer their livestock, both sheep and cattle, along the Divide during the late 1800s and early 1900s (Bakken 1970; Jensen 1970; Langille 1903; Morris 1905; U.S. Government nd). Langille (1903), in his survey of the Divide, had to drive his horses two days without feed due to destruction caused by the livestock.

Spring and autumn runs brought chinook, salmon, sea-run cutthroat trout, and steelhead to the upper reaches of the sub-basins. In 1899, the Oregon Legislature appropriated $15,000 to build four salmon hatcheries (Bakken 1970). One of these was placed near the mouth of "Hatchery Creek" on the North Umpqua in 1900. In 1901, a second salmon hatchery was built near the mouth of Steamboat Creek. Permanent ponds to hold the fish until they were seagoing size were included in the process by 1910.

Large-scale trapping did not disappear from the upper reaches of the Middle Fork of the Willamette for many years. One of the largest recorded expeditions in the mountain area above Oakridge was the Paddock-Dompier trap line of 1911-12. They established camps and ran trap lines out of Waldo, Maiden, Golk, Crescent, Clear, and Odell lakes as well as the upper Salt Creek area (Jensen 1970).

Along the Calapooya Divide, records indicate that Fred R. Sankey, a government trapper, packed his way over Staley Ridge into Skipper Lakes during 1930 (Jensen 1970). He did so in response to the request of a rancher running sheep along the Divide. While there he trapped and killed a number of wolves.

A study of the Calapooya Divide in the nineteenth and early twentieth centuries is a study of resource development and trends. It is also a study of people, of individuals, who lived on or near the Divide. With the exception of the archaeological record, investigators know little about the Indians as individuals prior to white contact. The literature of the nineteenth and twentieth centuries, however, refers to personalities like Charles Tufti and John Chuck Chuck who were Indians who homesteaded on the Middle Fork of the Willamette (Jensen 1970). Mountain stockmen and trappers, including William D. Bradley (Bradley Lake, Flat, and Trail) and Elijah Bristow (Bristow Prairie), opened up the area. Miners such as Jeremiah "Bohemia" Johnson (Bohemia Mining District and Johnson Meadows) explored the upper reaches of the Divide by the 1860s. Contract loggers like Jasper Hills (Hills Peak) had their influence in the area. Forest rangers, such as W.F. Staley (Staley Creek and Ridge), also left their mark.

During the early 1900s, the Cascade Range Forest Reserve underwent several administrative changes that affected the Calapooya Divide. In 1908, the U.S. Forest Service created the contemporary Umpqua National Forest in the Cascade Mountains from the Cascade Reserve. The Forest included lands south of the Middle Fork and

north of the Rogue-Umpqua Divide. In 1911, lands north of the Calapooya Divide were placed under the jurisdiction of the Cascade (now Willamette) National Forest that later included the Oakridge Ranger District and, in 1947, the Rigdon District. The 1911 administrative land exhange between the Umpqua and Willamette National Forests moved the Forests' common boundary to its current position along the crest of the Divide (Williams 1981).

Twentieth century development of the Upper Willamette and North Umpqua regions was expedited by the advent of the railroad, the contemporary road system, and the logging truck. In 1912, a railroad line opened as far as Oakridge on the Middle Fork. It was completed through the Cascade Mountain Pass (now known as the Willamette Pass) to Kirk, Oregon, by 1926. Along the North Umpqua a road to Steamboat was finished in the same year, and connected with a road from Diamond Lake in 1939. By 1930, motorized vehicles like the logging truck were in common usage. As a result, the Calapooya Divide became more accessible for development of its resources, including lumber and recreation. Consequently, the U.S. Forest Service and commercial organizations like Weyerhaeuser faced increasing demands to manage the Divide more effectively.

In an effort to control forest fires, lookout towers were built along the Calapooya Divide at Hills Peak (1923, replaced in 1935), Bearbones (1934), and Balm Mountain (1934) (Newman 1981; Williams 1980). Telephone access was provided the towers such as the line laid from Johnson Meadows to Bearbones in 1930 (U.S. Government nd). The towers were utilized for several years,

eventually being replaced by aerial patrols, radio communication, and a complex National Forest road system.

Between 1933 and 1941, the U.S. Forest Service utilized the Civilian Conservation Corps to build camps and roads in the area. One such activity included road building up Staley Ridge. By 1941, the remaining camps in the area were closed.

The logger has replaced the homesteader along the Calapooya Divide. Logging trucks, dynamite, and power saws have made their presence felt. The Umpqua and Willamette National Forests allow timber sales in portions of the Divide. Timber companies access the Divide through an extensive network of service roads, harvest the trees in authorized areas, and transport the logs to the mills on trucks. In addition to standard timber harvest methods newer balloon and helicopter logging techniques have been employed along the Divide since the 1960s. These new logging systems minimize soil disturbance in harvest areas.

Initially, recreation in the upper reaches of the sub-basins was limited. Roads were few and trips to the forest required several days on foot or horseback. This is no longer true, as the U.S. Forest Service created an extensive road system throughout the Umpqua and Willamette National Forests. The roads provide access to the Divide for tourists who wish to cross-country ski, hunt, fish, and backpack. Numerous public parks and campgrounds have been developed and are operated by Lane and Douglas counties, the State of Oregon, and the U.S. Forest Service.

The homesteader may be gone, but the livestock still summer along the ridge. The Bohemia Mining District produces limited minerals on a commercial basis. Nonetheless, contemporary prospectors wander the area in search of lost mines and elusive gold (Herrington 1980). Fish hatcheries along both the Middle Fork and North Umpqua rivers help stock the drainage systems. Power stations and reservoirs in both sub-basins provide the region with electrical power. Permanent settlement in the upper valleys remains limited, primarily confined today to U.S. Forest Service personnel and those who serve the passing tourist.

SUMMARY

Human exploitation of the Calapooya Divide during the last 14,000 years suggests cultural patterns similiar to those of mountain people elsewhere in the world. The difference in usage by the Indians and Euroamericans is one of scale, technological history, and cultural application.

The archaeological record suggests to researchers that an early adaptation occurred among Indians to the resources of riverine headwaters in southwestern Oregon as reflected in their tool kit (Davis 1974; Honey 1980). These Indians engaged in a seasonal round of transhumance that took them into upper elevations during the summer looking for food and tools. This seasonal round lasted until the present as indicated in the historic record. Archaeological research along the Divide suggests that Indians definitely used the

area as reflected by the tool and chipping debris. The weak state-of-the-art precludes any definitive statement about specifics of the Indian's seasonal round. Cultural patterning can be suggested from work completed on groups like the Kalapuyans (White 1975; Towle 1979; Collins 1952; Mackey 1974; Beckham 1981). Further research like that of Leondorf (1973) in the Pryor Mountains of Montana would be invaluable, particularly for establishing a local seasonal round of exploitation.

The ethnographic record suggests that Indian groups in adjacent regions engaged in the practice of building rock cairns as part of the rites of passage into adulthood. With the presence of rock cairns along the Divide it is conceivable that the Indians used the area for religious purposes. This can not be offered as a definitive statement without further research.

The historic and ethnographic record indicates that groups like the Klamath travelled across the Divide for purposes of trade and warfare. This is reflected in the number of trails present at white contact. As a result the area is not an isolated province and those who stayed in the area on a more permanent basis shared in both the Great Basin and Willamette Valley cultural diffusion spheres. This is reflected in the archaeological site tested near Johnson Meadows in the Bohemia Mining District (Honey and Kaiser 1980).

Not only did the Indians use the Divide as a means of subsistence, as a religious place, and a route of travel; but they also met at the hot springs in the area and Cap's Illahee Flat for

social purposes. This use of the Divide area for recreational purposes may well have occurred prior to the protohistoric period. To suggest that possibility can only be conjecture.

Arrival of Euroamericans in the area did not alter the overall patterns of useage along the Divide. In reality they superimposed another culture with similiar but different patterns. The initial settlers in the area were completely isolated from the outside world. Consequently they had to depend solely on their own resources. The available literature does not suggest they farmed along the Divide. Instead they remained in the foothill valleys year-round while using the Divide for summering their livestock, hunting, and gathering eatable plant resources as part of a seasonal transhumant round. They trapped for furs both to supplement their own resources and to sell.

Others came into the area on a seasonal basis to exploit available resources like minerals and wood, and when these disappeared, the people moved on. A case in point is the Bohemia Mining District. Others came to hunt, fish, and camp for purposes of recreation. These patterns have held true for the last 130 years. During the early 1900s, the Divide came under the control of the U.S. Forest Service. Trends of resource exploitation and recreation on a seasonal basis still apply though contemporary transportation networks on a regional basis bypass the area.

In cultural patterns of usage the Calapooya Divide exhibits characteristics of the Cascade Range as a whole, indicative of those suggested by Roe (1980) for the north Cascades. Cultural patterns

of usage are similar to those found in the Pryor Mountains of Montana, the hills of southeast Asia, and the Alps of Europe, differentiated primarily by nuance of expression and technological history. As such the Calapooya Divide reflects cultural traits of upland adaptation, not as a unique province, but as an extension of the Cascadian cultural province. Due to the lack of cultural research in the area, some of the aforementioned comments necessarily are those of conjecture. The fact still remains that upland adaptation to an altitudinal environment exists. Further research is appropriate to study the social expression of the local contemporary population, particularly the level of research completed by Burns (1963) on the Alps of Europe or Burling (1965) in southeast Asia.

IX. CONCLUSIONS

Habitat cannot be construed as a prime determiner of culture. Its component parts such as climate, physiography, and resources help, however, to shape the behavior of groups and individuals who, in turn, influence their environment. Over time a group will develop those cultural values which provide it with the familiarity and techniques necessary for survival in a given environment. Such an interaction between cultural groups and mountain environments can be observed on a global scale.

What constitutes a mountain is open to a wide variety of interpretations. In the Arctic, mountain scenery exists at sea level while in the tropics it may be absent at elevations of 9,800 feet or more. It is clear elevation above sea level alone is not an adequate measure for defining a mountain region. Price (1981) and Hollerman (1973) have provided an operational definition of mountains that establishes the landform's uniqueness as a separate physiographic entity regardless of the differences in elevations one finds in mountain ranges on a global scale. For the purposes of this study, their interpretation was preferred.

Mountains exist in many regions of the globe with environmental conditions varying from tropical to temperate. Indigenous human populations can be found in most of the earth's mountains. It is the hypothesis of this thesis that mountain environments require unique material, social, and ideological characteristics of their human inhabitants. A review of the

literature and field research corroborate this assertion though the documentation of such a uniqueness for montane culture is not without its limitations.

This work has shown that the vertical stratification of resources in mountainous zones calls for a staggered schedule of exploitation within an annual cycle. Constraints such as lack of suitable arable land, small landholdings, lack of sufficient water except through irrigation, and the often shortened growing season placed on agriculture in a mountain environment does not permit production of surplus foods which allow pre-industrial populations to live above the subsistence level. Trade with neighboring lowlanders provides an important dimension to the adaptation of montane cultures. Rather than being a barrier between groups, mountains become a zone of contact and circulation of ideas which allows montane cultures to synthesize traits from the adjoining lowlands. Constraints imposed by the nature of mountain terrain hinder attempts at domination by neighboring lowlanders. Consequently the biosocial history of high mountain areas is shaped by an isolation from the lowlands and resulting tenuous political ties. Those same ecological constraints do not permit ease of local communication and transportation. This isolation of cultural groups caused by the terrain expresses itself through a relatively closed corporate community; independence; emphasis on the small kinship group; and ethnic, linguistic, and religious diversity.

Over time human populations in mountain areas have developed highly refined cultural values which provide them with important

skills necessary for survival. The cultural expression of those groups living in mountainous areas attains varying levels of complexity depending upon the group's technological and social history. Traits common to a group tend to cluster at a geographic center fading at the boundaries where traits from adjacent lowland areas overlap. In the development of cultural traits and their distribution through geographical space, mountains direct human contacts inward to the group. This inhibits communication with the outside thereby providing a consistency of cultural patterning through time. This consistency may occur either through continuations of cultural traditions or the continuity of boundaries in spite of discontinuous culture history and human occupancy. That mountains support indigenous cultural groups does not alter the fact that others migrate into, through, and out of mountain areas for purposes of transportation, religious worship, recreation, and resource exploitation.

Some of the same cultural variables as have been revealed on a global basis can be observed among those groups inhabiting North American mountains over time. The archaeological record indicates that Indians have utilized high elevations for thousands of years. Research shows a pattern of differential exploitation of resources by an indigenous population of hunters and gatherers which was practiced seasonally at various elevations. This pattern of mountain-valley exploitation has been suggested for regions in Montana, Idaho, and Colorado. Due to the lack of ethnographic materials and the state-of-the-art in archaeological research, an

analysis of the cultural expressions of those prehistoric groups cannot be made to the same degree as for montane cultures like those in the Alps. However, the ethnographic record does disclose that there were groups of Indians who, at white contact, had a long history of living in mountainous areas. These groups were adapted to hunting and gathering in the upland areas as well as fishing in the mountain streams and lakes. Such cultural groups were often small family units unique from the larger social groups of Indians in the neighboring lowlands.

The archaeological record suggests that after about 5,000 BC an upland adaptation occurred among the Indians in the Cascade Mountains of western Oregon as represented by a stone technology. By at least 1,000 BC, a pattern of east-west seasonal transhumance had become established in the Cascade foothills. A number of interpretations have been proposed by researchers to explain the presence of archaeological complexes reflected by this upland adaptation in the Cascades (Beckham 1981; Cole 1968; Grayson 1975). The sites could be summer high altitude manifestations of Plateau and/or Great Basin cultures. They could be manifestations of the Willamette Valley culture area. They might also be a combination of the two adjoining lowlands.

Some believe the upland sites in the Oregon Cascades could be representative of a culture indigenous to the region and not strongly related to the cultures on either side (Cole 1968; Grayson 1975). The idea of a separate culture complex indigenous to the Cascades receives some support from the distribution of

ethnographically known aboriginal groups in western Oregon since, at white contact, the area was inhabited by the Molalla. In fact, Grayson (1975:500) suggests that "the Western Cascades formed a cultural subarea extending from at least Cascadia Cave on the north to the Umpqua River on the south, and the interplay between the peoples of this physiographic region and the peoples of the Willamette Valley had not been great." This work has led Minor to suggest a similiar cultural province in the Cascade uplands (Beckham 1981).

As indicated in this thesis, the presence of Indians in the Cascade Mountains and along the Calapooya Divide can be documented in the archaeological and ethnographic record. Available archaeological remains indicate these Indians had an ability to exploit their mountain environment. Other than the limited ethnographic material covering the Molalla, there is no scientific data available to suggest anything more than a seasonal exploitation of the upland areas by the Indians. The weak state-of-the-art in archaeological research in the Oregon Cascades precludes making definitive statements about a separate culture complex of Indians indigenous to the Cascades. To do so is both premature and conjectural. A scientific study utilizing statistical analysis of a viable sample of Indian sites on the scope of Loendorf's work in the Pryor Mountains is in order.

Euroamericans also inhabited the mountains of North America. Differences in usage of these areas by the Indians and Euroamericans was one of scale, technological history, and cultural application.

The historical record shows that the Euroamericans engaged in a seasonal round of transhumance living in foothill valleys on subsistence farms while utilizing alpine meadows to summer their livestock. They trapped for furs and gathered plant resources for sale to the neighboring lowlands in order to supplement their income. Ranchers in neighboring lowlands grazed their livestock in the mountains during the dry summer months also as part of a seasonal round of transhumance. Exploitation of the mountain regions for lumber, minerals, and recreation occurred both by the indigenous population and neighboring lowlanders.

This pattern of mountain-valley exploitation by Euroamericans is documented for the Cascadian province as a whole and is reflected in the case study component of this thesis describing the Calapooya Divide. Due to the lack of ethnographic research among the Euroamerican inhabitants conclusive statements about characteristics of a montane culture cannot be made. Sufficient evidence in the historical records indicates, however, that an adaptation to the mountain environment did exist. A carefully controlled analysis of the Euroamerican population along the Cascades within the framework of montane cultures as suggested on a global scale is warranted.

In completing this study, there have been limits in both data and design. With the exception of Burling's study in southeast Asia on hill people and Brown's work in New Guinea, the material utilized in this study has been drawn from temperate zone mountains. Furthermore, with the exception of Burling, none of the studies entered into a carefully controlled comparative analysis of the

indigenous mountain populations and surrounding lowlanders. Without further analysis of tropical mountain areas, comparative studies of lowland and montane culture in contiguous areas, and comparative studies of tropical and temperate mountains, statements about montane culture on a global scale must necessarily be of a preliminary nature.

Where communication routes are more open with greater interaction, trait distributions tend to be patterned less on geography and more on other aspects of culture including economics, language, religion, or nationality. With the more sophisticated transportation and communication of industrial society, particularly within the last 100 years, the uniqueness of a montane cultural area breaks down. Consequently it becomes difficult to identify cultural traits such as in the contemporary Euroamerican society along the Cascades.

Many of the works used for comparative analysis of global cultures are of an ethnographic nature. These works provide researchers with descriptions of a people and allow the researchers to establish key variables and internal relationships. Following the establishment of such a database, subsequent analysis can be made on a scientific and statistical basis. That the case study in this thesis is of a historical and ethnographic nature is a limiting factor. The contribution of the case study to anthropological research is that of a preliminary database of information for further scientific research.

Cultural regularities occur among mountain peoples on a global scale. That there are regional differencies is a given, but research leading to a more careful definition of the similarities and differences would aid in attempts to understand both man's relationship with his environment and the innovation and diffusion of cultural traits. Mountainous habitats appear to require unique material, social, and ideological characteristics of their human inhabitants. Some of these include a seasonal exploitation of resources within altitudinal belts, an independence and heterogeneity born of isolation sustained by the terrain, the lack of resources to live above a subsistence level without trade with the neighboring plains, and a culture which reflects the impact of being in the middle of communication between surrounding lowlanders. This thesis was an attempt directed at understanding some of the similarities and differences as expressed in montane cultures and how they might apply to western Oregon.

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