AN ABSTRACT OF THE THESIS OF

John B. Hatch for the degree of Masters of Arts in Interdisciplinary Studies in Anthropology, Anthropology, and Geography presented on May 13, 1998. Title: An Archaeological Investigation and Technological Analysis of the Quartz Mountain Obsidian Quarry, Central Oregon.

Abstract approved: Redacted for Privacy

Barbara Roth

The Quartz Mountain Obsidian Quarry is located in the Southeast corner of the Bend Fort Rock Ranger District in central Oregon, approximately forty-five miles southeast of Bend, Oregon.

The research of the Quartz Mountain Obsidian Quarry began with a literature search of other quarry sites in the area and the use of ariel photos to determine the survey area. After the survey area was established a ground survey was conducted. Following the survey several key areas were chosen for surface collections that could answer key questions: What types of core reductions were being used on Quartz Mountain?; and What types of materials were being utilized? (red/black obsidian found in rhyolite veins, red/black obsidian found in fist sized and larger nodule form, or large block black obsidian).

In order to answer these questions three collection units were established. The lithic material from the units was collected and analyzed and the information placed into a database, which was then grouped for statistical analysis, and generated into charts and tables.

The resulting data was then compared to the information found from an extensive literature search to see how the material that I collected compared to those found at other quarry sites. From this information I was able to determine that two different core reduction methods were being used on Quartz Mountain: blade core and bifacial core. Along with the different core reduction methods a mobility strategy also came into play.

In this thesis I will use the data gathered to determine the different core reduction methods and the mobility strategies that are associated with them.

Archaeological Investigation and Technological Analysis of the Quartz Mountain Obsidian Quarry, Central Oregon.

by

John B. Hatch

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Table of Contents

Table of Contents (continued)

List of Figures

List of Figures (continued)

List of Figures (continued)

Figure | Page

Archaeological Investigation and Technological Analysis of the Quartz Mountain Obsidian Quarry, Central Oregon

1. Introduction

Quartz Mountain obsidian quarry is located in Central Oregon, on the Deschutes National Forest in the southeast corner of the Bend Fort Rock Ranger District. The quarry consists of vast amounts of lithic debris left over from many generations of craftsmen. The quarry has several different types of obsidian ranging from red, to red/black to black.

Quartz Mountain has several dry drainages that show signs that water once flowed on a regular basis. The area where the red obsidian was extensively used has a drainage that still has Quaking Aspen *(Populus tremula)* growing, which indicates that water is still close to the surface. With the presence of fresh water and relatively flat ground close by, this area would have been an ideal location to camp. This area has an extensive lithic scatter, but has not been tested for buried cultural deposits. Other parts of Quartz Mountain have large outcroppings of rhyolite with veins of red, red/black, and black obsidian that show signs of mining by early craftsmen (Figure 1.1). Still other areas of the mountain have large cobbles of high grade black obsidian eroding from the hillside (Figure 1.2). These areas all show signs of quarrying over several miles of the southwest and south facing slopes. The north slope of the mountain has several drainages with rhyolite/obsidian outcrops with several small rock shelters all showing large amounts of lithic debris indicating extensive quarrying. The top of Quartz Mountain is relatively flat and has large stands of old growth Ponderosa pines *(Pinus ponderosa)*.

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The Quartz Mountain material source has been known about for many years, but very little survey work has been done on the steep slopes, as this area is considered low probability for finding sites (Claeyssens 1992). For the most part, the material from Quartz Mountain was considered as occurring in small cobbles that are dense and completely covered with cortex which require sectioning before workable flakes could be produced (Scott 1991:177). For this reason Quartz Mountain obsidian was considered of low quality and was overlooked as being a usable resource.

The major goal of this thesis is to determine if Quartz Mountain (Figure 1.3) has had any importance as an obsidian source in this region. I have been in contact with the Deschutes National Forest Service (Paul Claeyssens, Forest Archaeologist) and a cooperative agreement was developed to survey the entire mountain and do a surface collection in several key areas on Quartz Mountain. These areas were chosen because they best represent the materials used and the technology used to reduce the obsidian. The survey and collections were designed to allow me to formulate the extent to which this material source was used over time.

Prehistoric quarry workshops were an important early focal point in North America (Bamforth 1986, 1991; Binford 1979, 1980; Gould 1985; Kelly 1983, 1988a) and such sites are once again beginning to attract the attention of archaeologists concerned with the reconstruction of extinct cultural systems. The present trend toward technological, functional, and behavioral lithic analysis is well grounded in past research (e.g., Holmes 1894) but owes much of its current foundation to people like Don Crabtree

Figure 1.1 Mining Area. This area of red/black obsidian shows signs of extensive mining by early craftsman. The area at the base of these overhangs have large amounts of debitage possibly several meters deep.

Figure 1.2 Quarry Area. This area located on the south side of Quartz Mountain is covered with large cobbles, many of which have been reduced into cores or rejected for some reason.

and his many students. For the most part quarry workshops remain understudied, which could be due in part to the variety of problems they seem to present. One of these problems is the extent and vast quantity of artifacts that are present in these sites, for they can literally cover thousands of square meters. Therefore, most researchers have attempted to describe finished tools and other unique pieces at these sites, primarily for dating purposes; products manufactured; worked materials; and sometimes the manufacturing or lithic-reduction techniques represented (Singer 1984:35).

In this thesis, I investigate the technology of flake and tool production, and any evidence of material preference on Quartz Mountain. My primary emphasis will be on the technological production (specifically which reduction methodology, core or bifacial) was used. I also examine how artifacts located away from the material source can help archaeologists understand the movements of early humans in the region. By beginning my research at the source and addressing how these artifacts were made, this study will add to the understanding of cultural differences and movements through time and space.

The proposed research lasted two years, consisting of 70 days in the field doing surveys and collections. Along with the ground survey extensive time has been spent going over aerial photographs and USGS maps to get a better understanding of the ground conditions. Along with this research a literature search has been done to trace the movements of material from this source. This research has found material as far away as Mud Springs on the Crooked River National Grasslands (35JE49) located approximately 70 miles northeast , dating to around 10,000 B.P. (INFOTEC 1995).

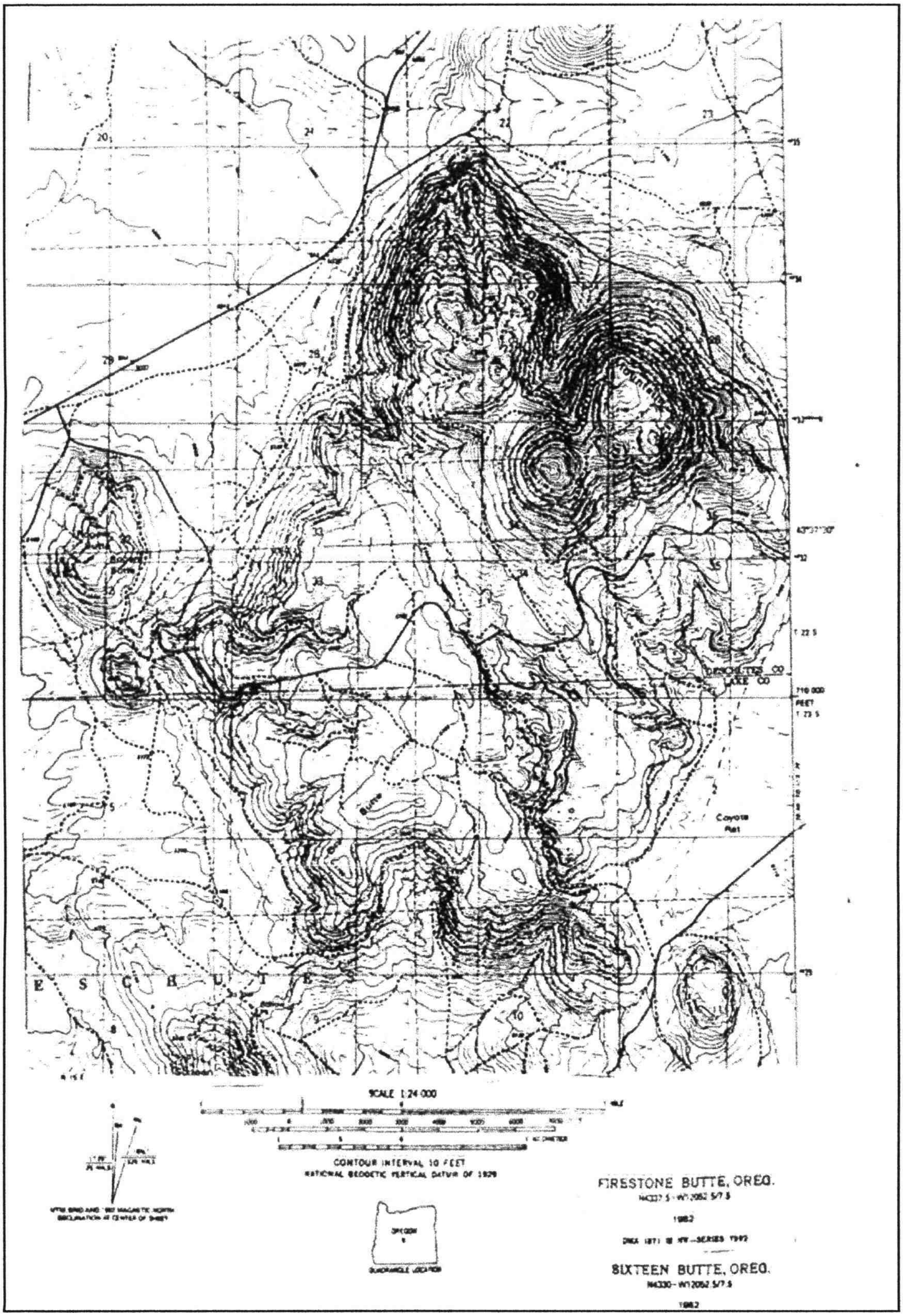


Figure 1.3 Survey Area Map

2. Prehistoric Period Overview of Central Oregon (Northern Great Basin)

The earliest evidence for human occupation in the Quartz Mountain project area is associated with the end of the Pleistocene. The earliest site with a good radiocarbon date is the Fort Rock Cave approximately twenty miles southwest of Quartz Mountain. This site is located on a former terrace of pluvial Fort Rock Lake (Figure 2.1), which at the time filled the now dry basin at the end of the last ice age.

The Fort Rock cave was first excavated in the 1930's by Luther Cressman (Cressman 1942) and later by Bedwell and Cressman in the 1960's (Bedwell 1973). It was during this latter excavation that a small fire hearth was found, associated with the fire hearth were stone tools. The resulting radiocarbon date of 13,200 B.P. +- 720 (Bedwell 1973) was given to the site. For many years the validity of this date has been questioned, in part because the tools found at the site were not Clovis.

Research has revealed that there are varying cultural dates from Fort Rock Cave and from another site, Cougar Mountain Cave #2 (Figure2.2) which is approximately ten miles south of Quartz Mountain. These two sites, as well as Connley Caves also dug by Cressman, confirms that occupation of the area began well before 10,000 B.P. (Bedwell 1973; Cressman 1940, 1942).

The research I conducted of the area has found that two technological traditions have been documented for terminal Pleistocene times. The Fluted Point Tradition, and the Stemmed Point Tradition. It is generally believed that the Fluted Point Tradition predates the Stemmed point Tradition in time (Bryan 1980, 1988: Willing et al.1988). Due to inadequate dates in the

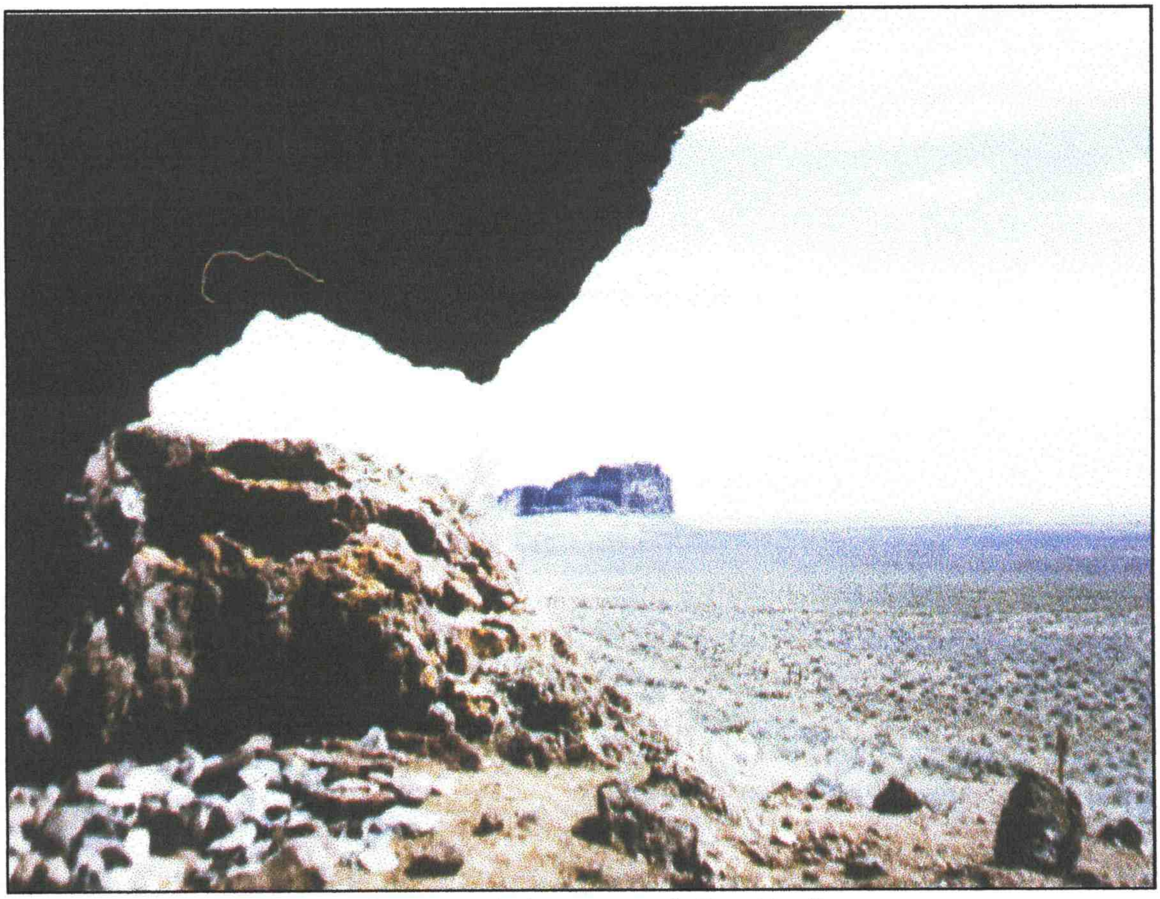


Figure 2.1 Looking out of Fort Rock Cave towards Fort Rock. (Photo taken by John B. Hatch)

Figure 2.2 Cougar Mountain Cave II. (Photo taken by John B. Hatch)

Northern Great Basin, there are not very many good radiocarbon dates associated with the two traditions to back this up. This is due in part to lack of research in this area. Elsewhere the dates for Clovis points are believed to fall between 11,500 and 10,500 B.P.; recent research done by David Brauner from Oregon State University has provided a firm date of more than 11,000 B.P. at Pilcher Creek (Brauner and Satler 1983) which places the Stemmed Point Tradition in the same time frame as the Fluted Point Tradition.

Some time between 10,000 and 7,000 years ago we start seeing the end effects of the last glaciation, resulting in significant changes in the local environmental conditions, and in turn changes in the local flora and fauna. The Early Holocene Period has been seen as a time when different cultural groups developed increasingly distinctive adaptive traditions to take best advantage of locally varying resource opportunities. This time period is known as the Early Archaic or the Late Paleo-Indian Period (Connolly 1995; Minor et al. 1987; Lebow et al. 1990).

My research has found that the dates for the Early Archaic tend to differ in the literature as well. Bedwell has been given credit for giving this time period the name " Western Pluvial Lake Tradition". This was the term he gave to represent the time period after the last glaciation, when the lakes and marshes became major focal points for peoples living throughout the Northern Great Basin. His work in the Fort Rock Basin places this period of lake and marsh adaptation between 8,000 and 11,000 years ago (Bedwell 1973:171). These sites were found to contain stemmed points, crescents and gravers. These sites have been found on terraces of now dry pluvial lakes (Fagan 1988:390).

The most compelling evidence for changing environmental conditions occurred during the terminal Pleistocene/Early Holocene time frame. During this time period we start seeing cultural material associated with the remains of Pleistocene animals that were thought to have become extinct somewhere around 10,000 years ago. Several areas where this has been recorded are in the nearby Christmas Lake Basin (Minor and Spencer 1977), and the Summer Lake Basin (Cressman 1942:93-94).

Research shows that in the Northern Great Basin the Early-to-Middle Holocene has a major geological event that dramatically changes the environment as well as human life ways in the area. This event, occurring at approximately 7600 B.P., was the eruption of Mt. Mazama. Following this event this area was marked by a climatic pattern which resulted in increasing aridity and the disappearance of most of the shallow lakes in this region.

The evidence for change during this period (ca. 7,000-3,500 years ago) can be seen in a shift from stemmed points to large notched projectile points. A change in habitation patterns is revealed by the appearance of the winter village. This change is considered one of the most important and archaeologically visible aspects of the Middle Holocene in the Northern Great Basin (Connolly 1995; Jenkins 1994a).

Research shows that the middle-to-late Holocene is marked by a return to wetter climatic conditions. It was during this time period that many of the dry or almost dry lakes n the Northern Great Basin were rejuvenated, accompanied by an expansion of forest and grasslands. In the Fort Rock Basin, Jenkins (1994b: 614) suggests that this Neopluvial "was a period during which conditions for increasing human populations were, on average, very good." Small semipermanent settlements appear in the Fort Rock Basin and further south (Jenkins 1994a). These settlements also occur in the Deschutes River Basin (Connolly 1995).

Jenkins (1994b) notes that the population density in the nearby Fort Rock Basin, as well as in the nearby Klamath Basin, appears to have been very low between 3000 and 2000 years ago. The reason for this could be in part due to decreasing stability and reliability of wetland resources. During this same time period on the Columbia Plateau the opposite was taking place (Connolly 1995: 21). Jenkins suggests that the correlation of dates in these regional samples suggests a history of interregional population movements (Jenkins 1994b:614). These migrations could have been caused by the fact that the area around Quartz Mountain was becoming drier and food was widely scattered, whereas in the Columba Plateau

region food was very abundant coming in the form of huge salmon runs up the Columbia river and abundant root crops in the uplands (Figure 2.3).

Research reveals that approximately 2000 years ago small notched arrow points began appearing in and around the Northern Great Basin (Connolly 1995: 21). Researchers feel that the appearance of these small notched points is one of the most important time markers for the late Holocene period. It is during this time period that general land use patterns have been thought of as more or less continuous from the middle Archaic times (Lebow et al. 1990), but Ames (1988) has suggested that there is evidence that shows that there were significant shifts in settlement types and population densities that have occurred throughout the last 2000 years. Jenkins found that in the nearby Fort Rock

Basin there were intermittent large settlements found on or around predictable upland root grounds, which is in total contrast to the earlier patterns found with lowland occupations. This pattern suggests that there was a shift from a reliance on hunting to one of root gathering and hunting as the opportunities presented.

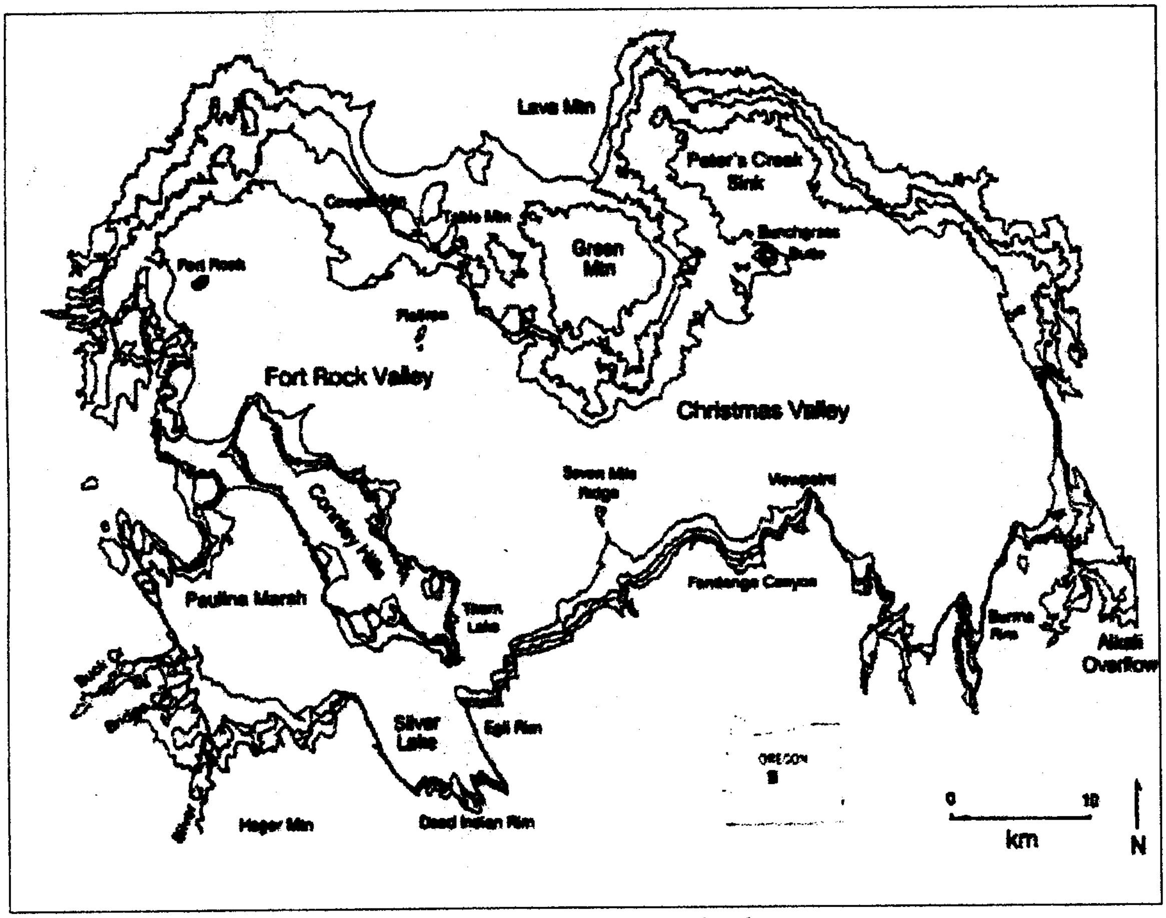


Figure 2.3 Map of four major shorelines in Fort Rock basin.
(Adapted from Figure 1, page 22, in Aikens, C.M., and Jenkins, D. L. 1994. Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman University of Oregon Anthropological Papers 50, Eugene.)

2.1 Ethnographic Lifeways of the Northern Great Basin

The Quartz Mountain area was used by a number of ethnic groups during late prehistoric times. Research has found that the Tenino, Northern Paiute, Molala, and Klamath groups were known to use this area. Historic records show that the Northern Paiute were in the area at the time of contact (Connolly 1995). According to these records, only the Northern Paiute had winter settlements on the Deschutes River near the city of Bend. Connolly's research has found that the Wadichitikas (Juniper-Deer Eaters) were located on the upper Deschutes just north of Bend and from there north to about the Wasco County line. The group that was located south of Bend was identified as the Yapatika (Yapa Eaters). Although this latter group has been associated with some of the Klamath subgroups know as the Yahuskin, Connolly's research has the Yahuskin's activities associated in the Silver, Summer, and Albert Lakes area, and ranging as far north to the Paulina, East Lake area.

My research places the Northern Paiute in my project area in late prehistoric times. The linguistic evidence (Connolly 1995; Hopkins 1965; Lamb 1958; Miller 1986) indicates that the historic distribution of the Numic languages, with which the Northern Paiute language is classified, is the end result of expansion north throughout the Great Basin during the last millennium. With this evidence, the presence of the Numic dialect in the Northern Great Basin is thought to be relatively recent. Therefore, given the current absence of a comprehensive prehistoric record, land-use models based on ethnographic sources provide the most accurate context for interpreting the archaeological record.

The archaeological and the ethnographic records show that the Northern Pauite wintered in multifamily groups at sheltered low elevation sites near the Deschutes River, and along the still present lakes such as Summer, Silver and Albert Lakes (Connolly 1995; Blyth 1938). During the winter months they lived off stored foods that were collected and cached during other seasons. These food stores were supplemented with fresh foods derived from opportunistic winter hunting and fishing. Starting in early spring family groups would go to different resource areas for root gathering, fishing and obsidian collecting. As the summer progressed they moved into the mountain areas for hunting and root digging. In the fall they would move again to gather berries. Other upland areas were visited by even smaller family groups.

The day-to-day tasks and annual cycle are exemplified by the Northern Pauite year (Figure 2.4). Gathering activities are found in the archaeological record represented by the presence of digging sticks, carrying baskets, milling stones; hunting is represented by atlatl and lanceolate points, the bow and arrow with both stone and metal projectile points, and various types of knives and scrapers used for various hide types. Extensive foot travel by those groups is represented by the rich finds of sagebrush sandals found at Fort Rock cave by Bedwell and Cressman in the 1960's (Aikens 1993). Among the thousands of known sites are a variety of winter village types. They range from well-built pit houses, caves near a major water source, to simple brush wickiups. Although there are some differences between other prehistoric peoples life ways and that of the people of the Northern Great Basin, archaeological evidence is not complete, nor exact, but it does indicate that it was very similar with a few exceptions (Aikens 1993).

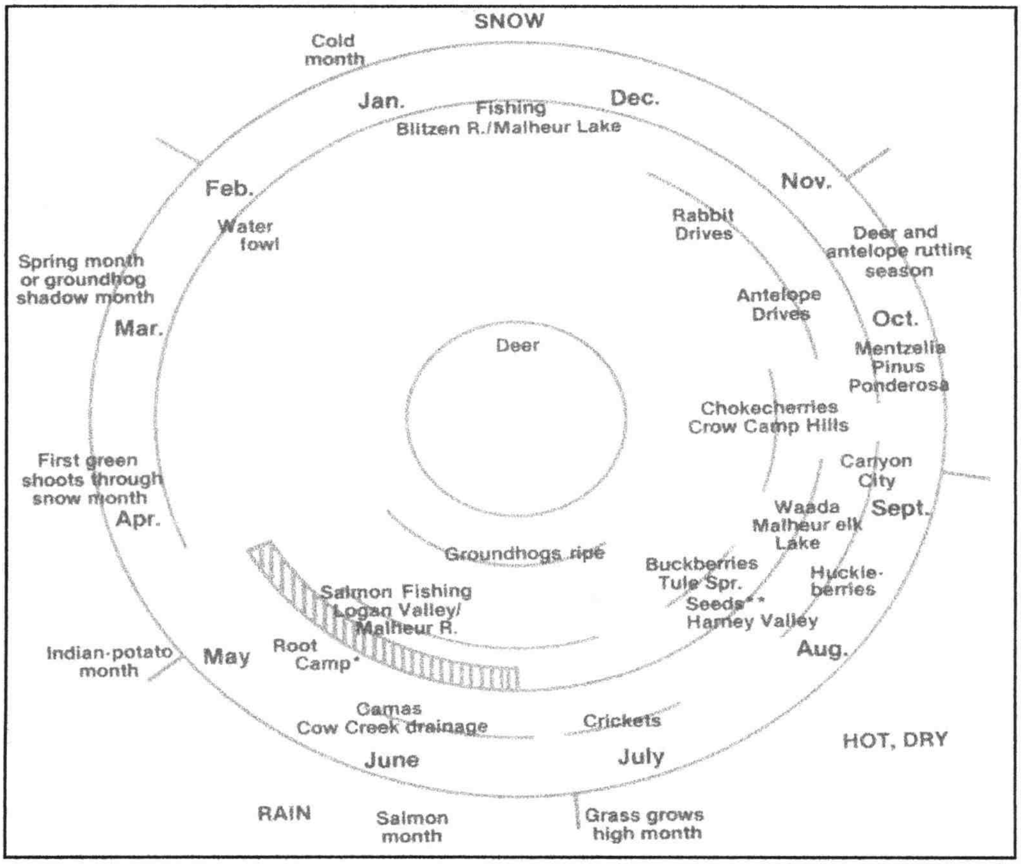


Figure 2.4 Seasonal Round (Image adapted from Fig.2.23 Harney Valley Paiute seasonal round. P.36, in Aikens, C. M. 1993, Archaeology of Oregon. U.S. Department of the Interior Bureau of Land Management, Oregon State Office, 1300 N.E. Ave., Portland, OR.)

2.2 Time/Environmental Change in the Northern Great Basin

If humans first ventured into the Northern Great Basin about 13,000 B.P. or sometime thereafter as the archaeological evidence for Fort Rock Cave, Cougar Mountain Cave #2, (Figure 2.2) and the nearby Connley Caves (Bedwell 1973; Cressman 1940) now suggest, they would have encountered a world of climate changes. This is a period of great change, one from the cold of the last glacial age to the warmth of the post-glacial. The geological record for this time period shows that glaciers in the nearby Cascades, Steens, and Blue mountains were starting to melt and disappear. During this same time period Fort Rock Lake, Silver Lake, and Summer Lake start to dry up. In addition many pluvial lakes, such as Millican Lake, vanish completely. In other areas such as in the Catlow Valley in southeastern Oregon all that is left are broad level plains (Cressman 1940). Travel in these areas reveals the remains of these lakes high on the hills and around the valley basins, evidenced by three or more beach terraces that that can still be seen (Figure 2.5). In some parts of eastern Oregon, beach lines occur as much as 350 feet above the basin floors (Summer Lake); this evidence indicates that these lakes were not only vast, but deep (personal observations).

It was during this time period that large animals such as mammoth (*Mammuthus columbi),* ground sloth (*Megalonychidae)*, giant bison (*Bison antiquus),* camel (*Campelops),* and the horse (*Equus)* became extinct (Aikens 1993). Not all of the animals of the time died off at the end of the Pleistocene. Some of the species that survived include deer, antelope, mountain sheep, bear, migratory and upland birds, rabbits and other small mammals. Along with these animals, predators such as cougar, bobcat, coyote, and wolves survived. Pollen records indicate that plant species of the late glacial times were much like what we have in the area today, the only exception being that boreal trees such as spruce, white pine, and fir were more abundant (Aikins 1993: 19). Another difference is that the timber lines were lower, and alpine species such as willow, and alder were more widely distributed. At the same time, the sagebrush-grassland communities found at the lower elevations were thicker in grass cover and covered a wider area than what is present today.

Starting around 9,000 B.P. the pollen evidence for central Oregon indicates that cold-tolerant trees were present in high terrain previously covered by tundra vegetation

(Aikens 1993: 19). Shortly thereafter we start seeing juniper and sagebrush follow the trees into the higher elevations as temperatures continued to rise. Between 7,000 to 4,500 years ago we see a period of general aridity, where a large percentage of the basin lakes dried up. As a result of this aridity, the areas left by the now dry lakes created extensive sand dunes were created along modern shorelines. These areas remained dry until about 4,500 years ago (Neopluvial) when a period of global cooling brought traces of Neoglaciation back into the area. This regime of cooler and moister has continued to the present time (Aikens 1993: 19; Connolly 1995: 15-16; Cressman 1977:46; Willing 1988).

The time periods that I feel have shaped the landscape and how early humans used it can be summarized as the time periods starting after the last great glaciation. These intervals, starting with the Anathermal, which was a period cooler and moister than today, lasted from 9,000-7,000 B.P. This was followed by the Altithermal which was a period warmer and dryer than today, lasting from 7,000-4,500 B.P. This was followed by the Medithermal. The conditions during this time period were much like the conditions that we have today. But, like most interpretations there are exceptions to the rules. Research has found that the detailed paleoclimatic evidence indicates that temperature and moisture fluctuated quite evenly within these periods.

This evidence shows that in the midst of what was considered dry times, there were periods of wet phases, but these wet periods were not enough to change the overall dry periods. And in return the reverse was true; during the wet periods there were periods of more arid times (Aikens 1993; Mehringer 1977,1986), but not dry enough to change the overall period.

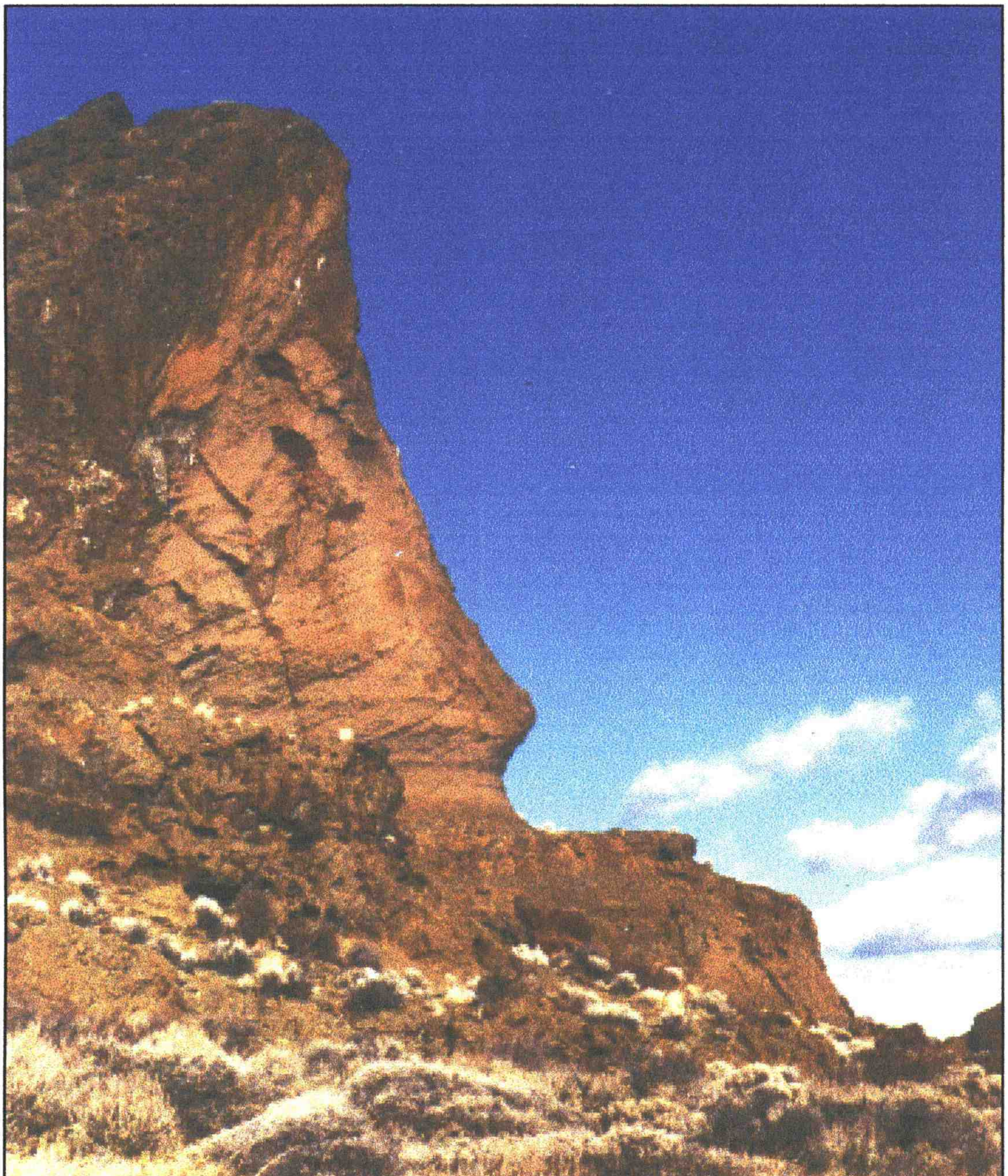


Figure 2.5 High Water Marks at Fort Rock showing 3 terraces.

Research has shown that the degree to which large scale climatic changes may affect local occurrences of certain plants and animals is of direct importance to human use of the landscape (Aikens 1993). In retrospect, the topographic and biotic diversity of an area is critical to how humans used a given area. Therefore, it has been found that a global or a regional shift in temperature is less likely to cause major changes in species availability within a topographically diverse area than in more uniform terrain. In comparison it has been found that when precipitation and evaporation of moisture is affected by temperature, it varies with altitude. Thus when there is a rise in temperature, it could have adverse effects on plants and animals from a biotic community over a large area, but could effect species distribution much less dramatically in an altitudinally varied landscape. With these changes, a given plant species might have to shift its range only a few hundred feet in elevation in order to acquire enough moister to survive, and likewise the animals that feed off it could shift as well. Thus, if these changes last long enough, it could affect the long-term human settlement pattern, drastically changing the placement of hunting and gathering and habitation sites over a landscape. The archaeological evidence has shown that the environment and its changes are of great importance to prehistoric Northern Great Basin communities (Aikens 1993;Connolly 1995;Cressman 1977:46).

3. Site Data

3.1 Prehistoric Overview of the Deschutes National Forest

Over the past two decades numerous archaeological surveys have been done in the Deschutes River drainage and on the high desert that is in close proximity. On the Deschutes Forest there are well over 500 sites; of these sites 12 sites have been excavated. The data have yet to be analyzed or synthesized into a prehistoric cultural chronology for central Oregon. As a result, archaeological sites are commonly interpreted within the framework of established prehistoric chronologies of the Great Basin and Columbia Plateau areas.

Great Basin Chronologies show that prehistoric people have inhabited this region for the last 13,200 years (Bedwell 1973). On the southern Columbia Plateau, a lengthy sequence of prehistoric occupation is also represented (Aikens 1993; Cressman 1977; Ross 1963). For the purpose of this thesis I will use data specific to the Deschutes National Forest and the Upper Deschutes River basin. The area's prehistory can be summarized in conjunction with a discussion of the archaeological investigations completed to date, since they are closely interrelated.

The first archaeological research on the Deschutes National Forest was conducted on the Crescent District in 1934 by Luther S. Cressman of the University of Oregon. The research involved the examination of two bifacially flaked obsidian artifacts which were found beneath Mount Mazama ash (6,700 B.P.) during a construction project near Wickiup Reservoir (Cressman 1937). Test excavations were subsequently undertaken at the location and two bifaces were found, but no other prehistoric materials were recovered. Cressman (1977) believed these tools provided evidence of the initial (pre-6,700 B.P.) human occupation of central Oregon.

Archaeological research was continued on the Crescent District by Cressman (1948) in 1946 at the Odell Lake Resort site. The site was found during a construction project which involved excavations beneath Mount Mazama ash. Cressman's subsequent archaeological excavations yielded several lanceolate-shaped obsidian bifaces, chipped stone debitage, and ground stone tools below the layer of Mount Mazama ash. Unfortunately only limited excavation work was undertaken at the site but it proved to be one of the first documented "Paleo Indian" sites in central Oregon. Cressman (1948) tentatively noted the similarities between the site assemblage and artifacts found in the Klamath Basin to the south.

In 1948, an archaeological survey of the proposed Benham Falls Reservoir was undertaken by the Smithsonian River Basin Survey crew (Osborn 1950). The project area is located 3.2 km south of Benham Falls and extended upstream for about 22.5 km. A total of 32 prehistoric sites were recorded during the survey. Nearly all were discovered on the first gravel terrace above the Deschutes River flood plain (Osborn 1950: 115). Although no test excavations were undertaken, all 32 sites were assumed to be surface manifestations. Projectile points, "knives," "blades," "choppers," ground stone tools, and lithic debitage were collected during the 1948 survey. Many of the projectile points were found to be similar to type found in the Great Basin and represent a time span of 5,550 to 230 years B.P. (Heizer and Hester 1978: 3-9). Based on the survey data, Osborn has hypothesized that prehistoric sites in the area were occupied on a seasonal and intermittent basis.

In 1961 archaeological excavations were conducted at the Lava Butte site (35DS33), located 5.6 km southeast of Benham Falls (Ice 1962). The Lava Butte excavations were undertaken in order to mitigate negative impacts caused by the construction of a Pacific Gas transmission line (first of two lines). The site proved to be archaeologically rich and yielded an extensive inventory of prehistoric tools, chipped stone flakes, and ground stone processing equipment. Data from the site indicates that the prehistoric inhabitants focused on hunting, plant processing, and the production and maintenance of stone tools. The site was originally believed to have been occupied during the last 200 to 500 years (Ice 1962: 49) but a later analysis of the artifact assemblage (Figure 3.1) indicates the site may have been used by prehistoric people as early as 4,000 years ago or earlier (Davis and Scott 1984).

During the early 1960's, a several archaeological investigations were undertaken in areas surrounding the Deschutes National Forest. Research by University of Oregon archaeologists in the Round Butte Dam Reservoir area at the confluence of the Metolius, Crooked, and the Deschutes Rivers, resulted in the location of 48 prehistoric sites (all under water at present time). Thirty-two of the sites were tested or surface collected (Ross 1963). Based on evidence from the study, Ross (1963) suggested that rock shelters along the Deschutes River were preferred by earlier prehistoric inhabitants while later aboriginal groups camped closer to the open flood plain (Ross 1963: 114-116).

The study concluded that sites on the west side of the Deschutes River were inhabited by groups affiliated with the Klamath and Great Basin areas, while on the east side of the Deschutes sites showed cultural affinities with the Columbia Plateau. At present time this hypothesis has yet to be tested in other areas along the river (Scott 1986).

By the mid-1960s and early 1970s, strengthened environmental and historic preservation legislation resulted in an increase in the number of small-scale archaeological survey and excavation projects throughout the region. One of the first-small scale excavation projects on the Deschutes National Forest was undertaken in 1976 and involved the test excavation of two sites near Sunriver, Oregon.

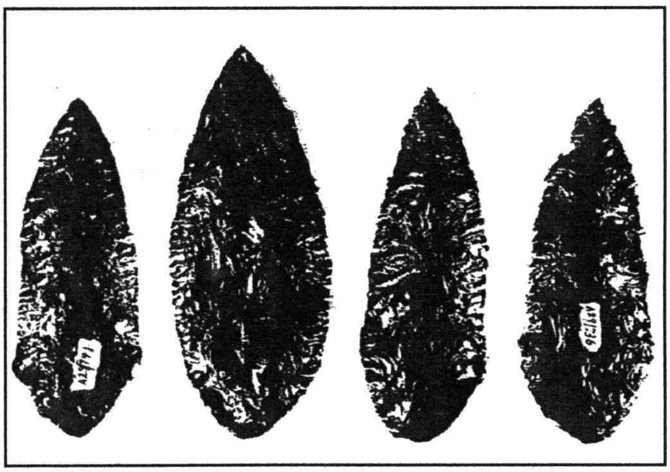


Figure 3.1 Haskett Points. Haskett style points found at Lava Butte site (Ice 1960).This point style dates from 7,240-11,200 (Beck and Jones 1997:196).

The project was conducted in advance of a land exchange project involving the Deschutes National Forest and Sunriver Properties (Cole 1977). One of the sites was found to contain very little archaeological evidence, but the other site (35DS39), which is located on a bluff adjacent to the flood plain, yielded numerous prehistoric tools and an abundance of chipped stone flakes. By cross-dating the various projectile point types, Cole has estimated that the sites were occupied prior to 600 years A.D. (Cole 1977: 19).

By 1981 a major archaeological excavation on the Deschutes Forest was undertaken at Lava Island Rockshelter (Minor and Toepal 1982,1983). Excavations were initiated because the rockshelter was in the land exchange between the Inn of the Seventh Mountain and the Deschutes National Forest. The rockshelter is situated on a steep, rocky slope above the Deschutes River approximately 8 km southwest of Bend, Oregon.

Excavations revealed a bark-lined storage pit, numerous lanceolate shaped bifaces (Figure 3.2) and thousands of chipped stone flakes. The lanceolate bifaces were suggested to be similar to Haskett projectile points which were commonly used 8,000 to 10,000 years ago on the Sank River Plain, indicating that the rockshelter (and the Deschutes River valley) were inhabited at a very early time period (Scott and Davis 1984). A more recent examination of the Lava Island bifaces, however, that suggests the points may have been of a more recent origin and lack the technological traits typical of the Haskett point type (Scott and Davis 1984). The excavations did provide reliable evidence of an Archaic "Elko" period (found above the cache of lanceolate bifaces) occupation (ca. 4000-1000 B.P.) and late prehistoric habitation (ca. A.D. 1840), presumably by Northern Paiute Indians.

In 1982 test excavations were conducted at the Sand Springs site on the southeastern edge of the Deschutes National Forest. The excavations revealed two prehistoric components separated by a thick layer of Newberry pumice deposited some 1600 years ago (Scott 1985). The artifact assemblage from the pre-Newberry component (the post-Newberry component was badly disturbed) contained few formal tools and an abundance of chipped stone obsidian bifaces (Figure 3.3 and 3.4) and debitage, suggesting that the site was used as a lithic workshop. A radiocarbon date of 2750 B.P. was obtained from this component. X-Ray Fluorescence Sourcing showed that the obsidian from the site was obtained from the nearby Quartz Mountain Quarry. Use of the Sand Springs site apparently decreased considerably after the 1600 B.P. eruption of nearby Newberry volcano (Scott 1985). The prehistoric habitation of Sand Springs spans the last 4000 years and highlights the importance of local volcanology and lithic technology for understanding regional prehistory.

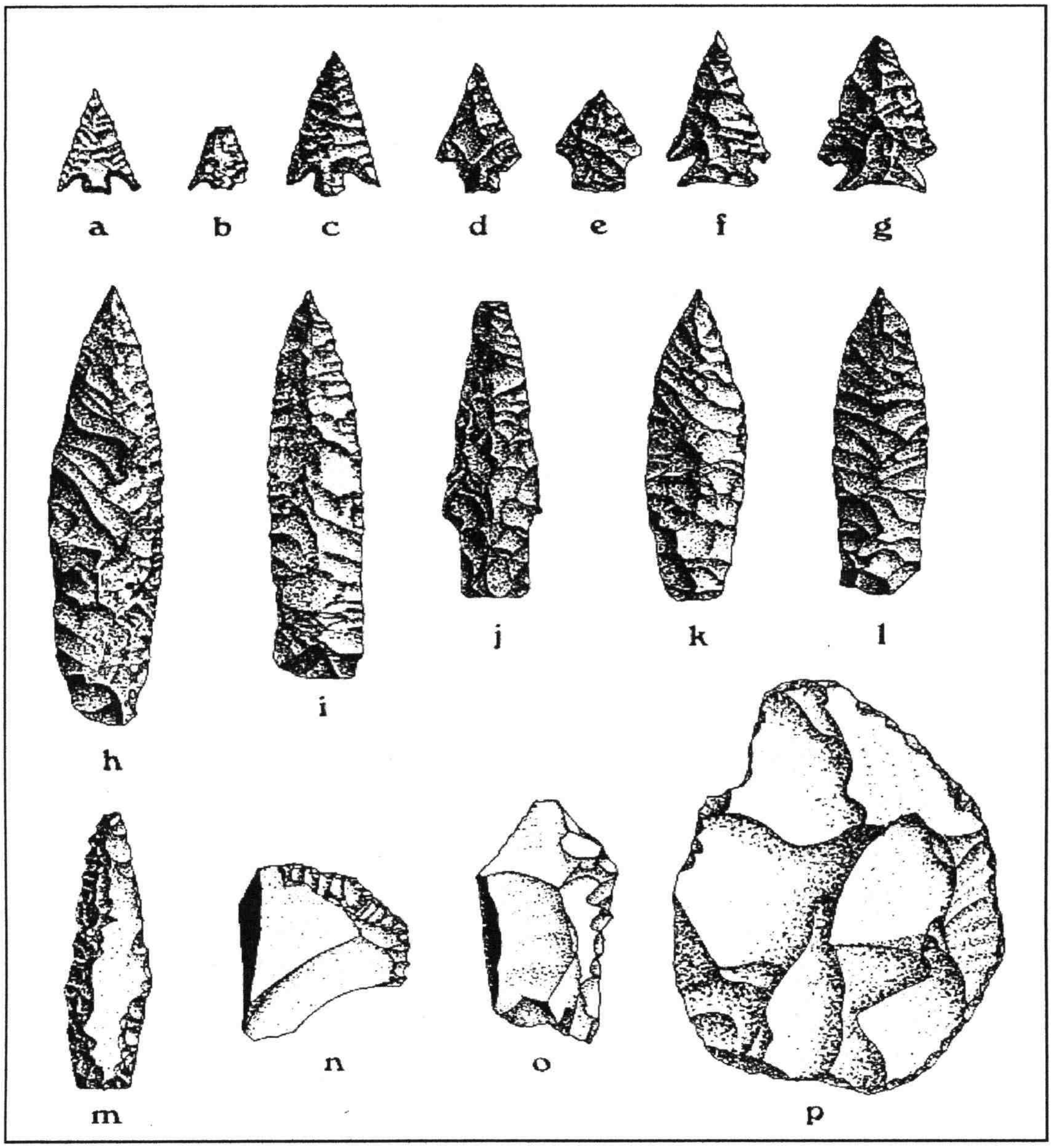


Figure 3.2 Lava Island Artifacts. Chipped stone artifacts recovered during excavations at Lava Island Rockshelter: a-d, narrow-necked projectile points; e-g, broad-neck points; h-l, lanceolate points; m, knife; n, scraper; o-p, retouched flakes (shown actual size) (Minor and Toepel 1981).

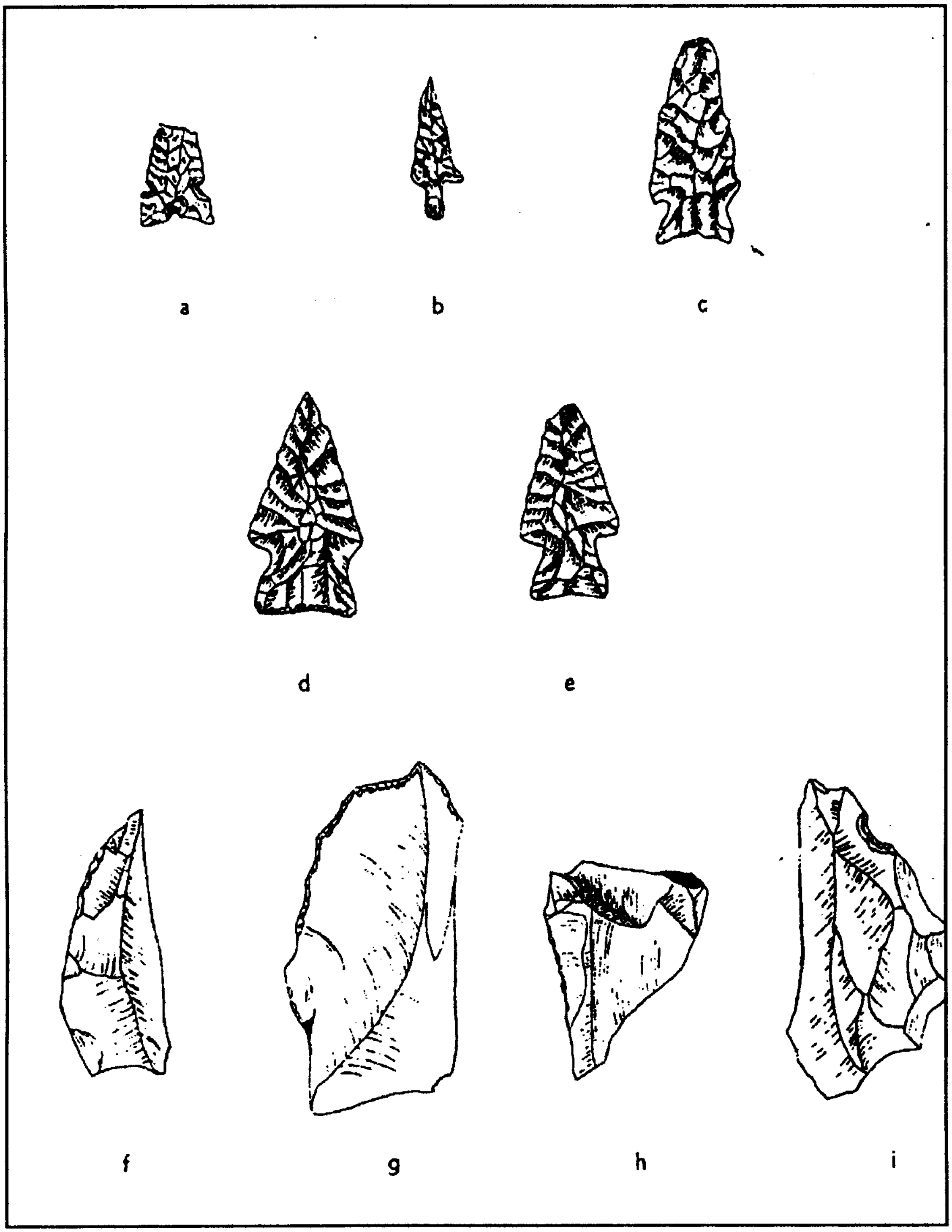


Figure 3.3 Sand Springs Artifacts: Projectile Points and Unifacial Tools. a) Desert Side-notched; b) Rose Spring; c-e) Elko; f-g) Type 3 unifaces; h) Type 2 uniface; i) Type 7 uniface. (To scale) (Scott, 1985)

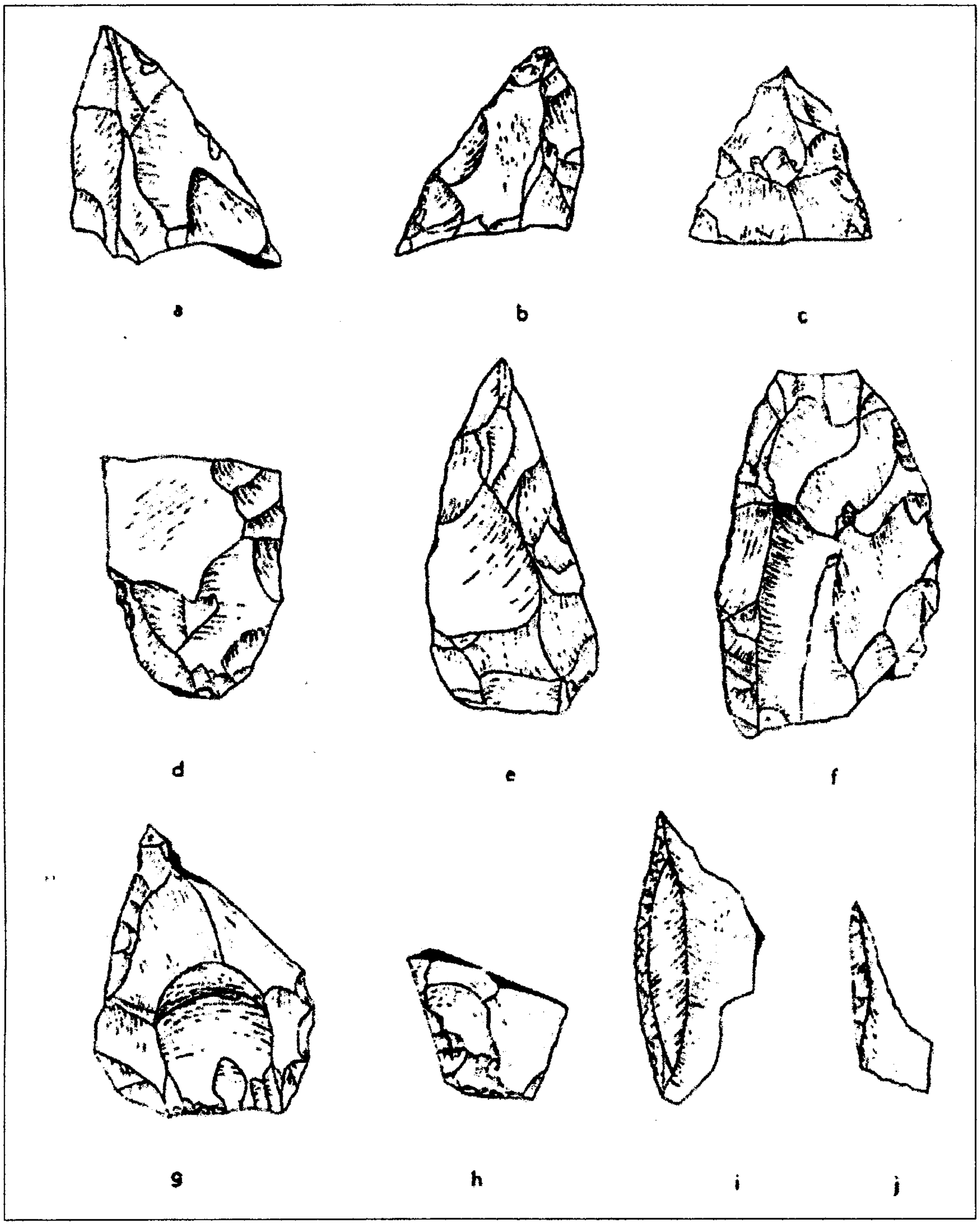


Figure 3.4 Sand Springs Artifacts: Bifacially Flaked Tools and Trimming Flakes. (a-b) biface blanks with perverse fractures; c-d) blanks with lateral snap fractures; e-f) whole biface specimens; g) base fragment; h) midsection; i-j) bifacial trimming flakes. (To scale) (Scott 1985)

In 1982, a cultural resource survey of a land exchange project involving the Deschutes National Forest and the Inn of the Seventh Mountain Resort located 12 archaeological sites on the west side of the Deschutes River near Bend (Connolly 1983). All of the sites consisted of small clusters of chipped stone flakes located above several intermittent drainages on a large broad terrace above the Deschutes River. One previously recorded archaeological site (35DS57) in the land exchange was test excavated in 1980 for a Cascade Lakes Highway project (Pettigrew and Spear 1984). Although the site revealed only minimal surface evidence, the test excavations produced more abundant subsurface archaeological deposits including flaking debris and small quantities of bone (Connolly 1983; Minor and Toepel 1983). Five projectile points, typologically similar to both Great Basin and Columbia Plateau point styles, were recovered. These points place the occupation of the sites somewhere between 6800 and 1000 B.P. On the basis of the test excavation data, the sites are believed to represent intermittently occupied hunting camps (Minor and Toepel 1983: 61). Full scale data recovery work was conducted during the summer of 1984 at four of the largest prehistoric sites in the land exchange. A detailed report is said to be forthcoming.

In 1984 two large caches of obsidian bifaces were recovered from Bend and Fort Rock Ranger Districts (Scott and Davis 1984). Both caches are excellent examples of the morphological variability inherent in a stone tool assemblage and provide insight into local stone tool technologies. Hydration dating suggests the cached bifaces date comparatively late in time, perhaps within the last 2000 to 3000 years.

From 1990 to 1992 the State Museum of Anthropology at the University of Oregon has conducted archaeological investigations in the caldera of Newberry Volcano. The research was done in connection with proposed reconstruction of the approximately 5 mile long section of highway between Paulina Lake and East Lake within the caldera. The work involved two seasons of testing at about a dozen sites, and formal data recovery excavations during the summer of 1992 at four sites.

The caldera is important because of the Early Holocene cultural record. In addition to volcanic deposits from caldera vents, Newberry Volcano is within 50 cm isopach zone of Mt. Mazama airfall pumice. Pre-Mazama age surfaces were located at a number of locations during the fieldwork in the crater, but associated cultural deposits were found to be very extensive, and closest to the modern ground surface at the Paulina Lake site (35DS34), which is crossed by the highway entrance to the crater. The bulk of the 1992 field season was focused on the excavation within the pre-Mazama component at this site. The work was limited to areas that would be directly affected by the proposed highway reconstruction project, with significant changes to the construction design which were made to minimize impacts to the site and extensive portions of this important pre-Mazama site were left intact.

Preliminary analysis of cultural patterns in the pre-Mazama component at the Paulina Lake site reveal a high degree of compatibility with subsistence settlement patterns observed regionally. Between 10,000 and 7750 radiocarbon years ago, there appears to be evidence for a broad range of extractive activities pursued from a relatively stable residential base, a function consistent with the regional pattern. This pattern shifts at the Paulina Lake site between 7750 radiocarbon years ago and the Mazama eruption to one of more focused activities pursued from a less permanent base camp (Connolly 1992).

In summary the general chronological guidelines of aboriginal cultures have long been established for the Columbia Plateau (e.g., Leonhardy and Rice 1970) and the Northern Great Basin (e.g., Bedwell 1973) for at least three decades. Dumond and Minor's (1983) cultural history for the Wildcat Canyon, located on the Columbia River upstream for the mouth of the John Day River, is considered one of the most relevant for that part of northeast Oregon. My research has found that there is no comparable archaeological record from the Deschutes River Basin (Connolly 1995: 24). This is due in part to the simple fact that scientific research has not been done on any of the rockshelters in the Deschutes Basin other than what Cressman and Bedwell have carried out in the early 40's (Cressman) and early 70's (Bedwell) at Fort Rock Cave and Cougar Mountain. At these site there was not enough data gathered to establish a good chronological record for the region. For the Fort Rock Basin, the generalized record made by Bedwell (1973) and later by Toepel (1980) still remains as the only work done on the Fort Rock Basin culture history (Connolly 1995: 24), even though evidence relating to the last 3000 years of prehistory is still lacking. In short, the existing chronological models remain elementary and generalized outlines, lacking critical detail for the immediate project vicinity.

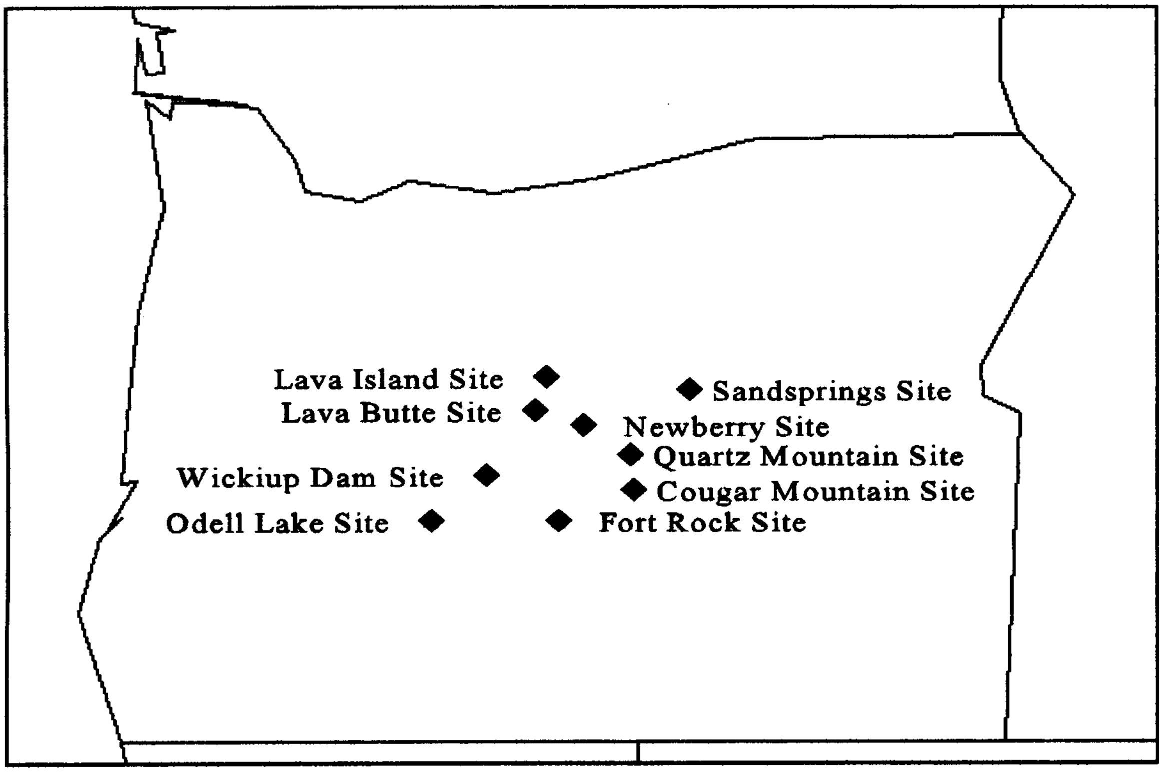


Figure 3.5 Known significant early sites in Oregon.

3.2 Geology and Soils

Deschutes and Lake counties contain geological features such as fault systems, cinder cones, lava flows, lava tubes and ash deposits. The High Lava Plains are described as a youthful tract of late Cenozoic lavas, ranging from 4,000 to 5,000 feet (Baldwin 1981). Extinct and dormant volcanoes are abundant throughout Deschutes and Lake Counties. Among these is Newberry Volcano, which is a primary source of obsidian raw materials in the region. The regional geologic structures have determined the soil composition, altitude, microclimate pattern, water sources, vegetation zones, and wildlife habitat. These geological and environmental features directly influence how humans have lived in the two counties during the last 12,000 years. Of great significance to human populations is the presence of numerous obsidian flows associated with past volcanic activities. Among the more significant cultural toolstone resources are: Obsidian Cliffs, Newberry Volcano (which includes McKay Butte), Glass Butte, Quartz Mountain, Cougar Mountain, and Sycan Marsh. Lava tubes were also important to prehistoric populations. They provide shelter and access to water usually in the form of perennial ice or springs. Most of the lava tubes within Deschutes county are part of the Horse Ridge and Arnold systems.

The geologic environment has also been changing over this period, requiring alterations to human settlement patterns. The most devastating geologic events were volcanic eruptions of Mt. Mazama in 6,700 B.P., Newberry Crater in 6,700, 3,500 and 1,400 B.P. and Lava Butte at 6,150 B.P. (INFOTEC 1990).

The High Lava Plains, in which most of the two counties are situated, are composed of middle-and late-Cenozoic volcanic uplands which maintain a moderate topographic relief with an elevation range between 3,000 and 8,000 feet. These High Lava Plains are marked structurally by the Brothers Fault Zone which trends west-northwest for the length of the province (Lyman 1983:5). This *en echelon* normal fault zone acts as a fundamental structural boundary between the Blue Mountains and the Great Basin's north-south faulted volcanic terrain. These uplands are overlaid by the Deschutes Formation, which is different in structure from Clarno Formation on the other side of the Crooked River. The Deschutes Formation is composed of tufaceous sedimentary rock throughout the upper-and middle-Deschutes Valleys (INFOTEC 1990: 2-39).

Soil tests conducted in the past several decades have numerous inconsistent references to soil types within the region (Lyman 1983:9). Numerous soil-type distribution maps created for land use purposes have also been produced throughout the years using various scales and resolutions. Generally soils within the counties belong to the Metolius, Houstake, Laidlaw, and Statz series: all sandy loams of similar composition. Soils in the northern part of the county are predominately of the Houstake and Statz series. The former series is a loamy sand formed in alluvium of ash materials eroded from lava, and typically found in depressions on lava plains with slopes from 0 to 5 percent (INFOTEC 1990: 2-43). These soils are taxonomically classified as course-loamy, mixed, mesic and aridic. The Statz series is composed of shallow, well-drained sandy loam soils located on the lava plains with 1 to 15 percent slopes (INFOTEC 1990:2-43). Its taxonomy is very similar to the Houstake series.

From Terrebonne to La Pine, post-glacial erosion in the small valleys has created sediments consisting primarily of: stratified diatomaceous silts, sands, and fine gravels derived from the erosion of nearby basalt shield volcanoes of the Pliocene and Pleistocene age, as well as volcanic air fall deposits of basaltic to rhyolite composition. Lacustrine and fluvial sediments of the Late Pleistocene age in the area of La Pine occupy a basin between the axis of the Cascade Range and Newberry Volcano to the east (Chitwood 1976).

4. Research Design for Quartz Mountain

Located on the Fort Rock Ranger District of the Deschutes National Forest, Quartz Mountain offers the opportunity to record a raw material source before collectors remove the undisturbed remnants of early human use of this obsidian source.

My research has found that Forest Service policy only requires that 20 percent of low probability areas be surveyed (Claeyssens 1992: 29). A review of a USGS map places most of Quartz Mountain in this category (L2, slopes greater than 20%). Having worked for the Forest Service for several years using these guidelines to set up surveys, I was well aware that much of Quartz Mountain had not been surveyed. With this in mind I set up my survey to look at those areas that I felt had not been surveyed, but had the potential to yield information on prehistoric use of the mountain's raw material source.

The survey of the mountain was conducted June 1997 through August 1997 by John Hatch, Theresa Miller, Alan Greenfield and Kim Hatch. Two or more surveyors covered the mountain using north-south transects spaced 10-20 m apart. When the topography did not permit this strategy, the transects were done according to the topography.

The survey revealed that in the area located on the NW slope (T23S, R15E , Sec. 5 NE, NE) of Dry Butte, just off the 2269 road, fist-sized nodules of red/black and black obsidian are present in large numbers. Large veins of predominately red obsidian with small amounts of black obsidian were present in the same location. These veins of red obsidian were mined out of the rhyolite to the extent that large overhangs were created, with extensive lithic debris scattered downhill from these locations. On the south side of Quartz mountain, another area of rhyolite outcrops have veins of red and red/black obsidian, but this area was not used as extensively. Lower down the south slope there is a very large area of large blocks of black obsidian that shows extensive use. On the north slope there are areas of very large boulders of black obsidian with some small areas of rhyolite with veins of red/black obsidian. This area also shows extensive use. The only area on the mountain that I found that did not have any obsidian was the northeast side. Based on the distribution of materials on Quartz Mountain, I addressed two major research questions:

1. Why was the red/black obsidian in the large veins extensively mined, whereas the same material, which can be found in nodules on the hill side in the same area, appears to have not been utilized as much or at all? I attempted to answer this question by designing a collection strategy that sampled workshop areas and by taking samples of both materials. I also used the same tools available to the early peoples and conducted lithic reduction experiments to see which material had the best physical properties. These experiments were done to determine if the nodules have structural flaws that made them less desirable over the material found in the large veins.

2. The survey of the area found that at least two different lithic reduction strategies, blade core reduction and biface reduction, were used to reduce the materials found on Quartz Mountain. In order to learn which reduction strategy was used the most, I used a collection strategy designed to obtain a good sample of both reduction methods within the same given area. The surface collection

gave me a better understanding of the lithic reduction strategies used on Quartz Mountain. This information and the survey of the area can establish the prehistoric use of the area so the U.S. Forest Service can better maintain the resource in the future.

The areas on Quartz mountain that I thought could best answer these questions are located in the NW 1/4, of the NW 1/4 of Section 4 and the NE 1/4 of the NE 1/4 of Section 5, Township 23 South, Range 15 east (see Figures 4.1 and 4.2). These areas were chosen to answer these questions, because they represent at least one or more types of obsidian (red/black obsidian found in veins with nodules or black obsidian) and both reduction methods of ore reduction were present.

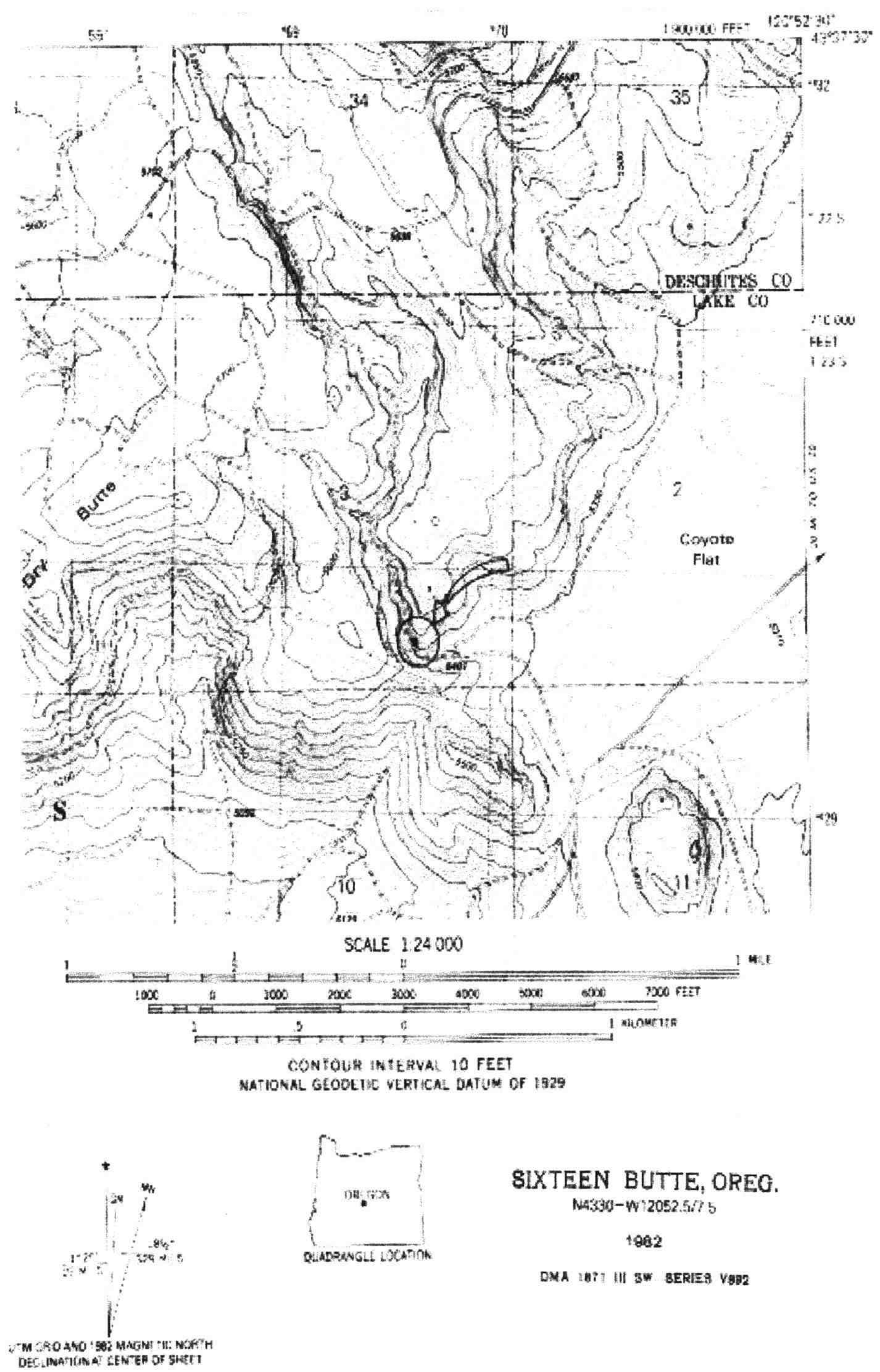


Figure 4.1 Location Map of Collection Unit A (block type obsidian).

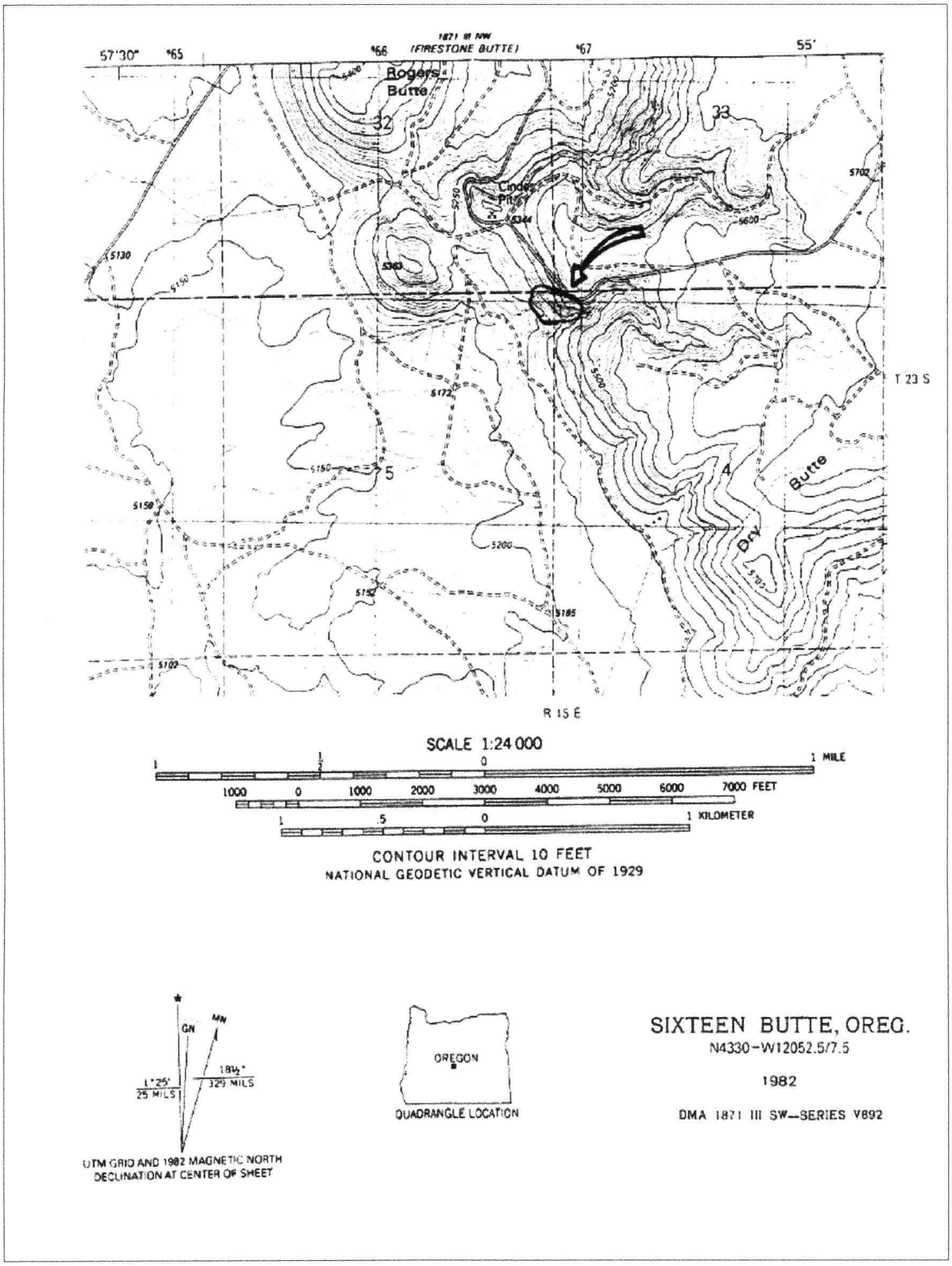


Figure 4.2 Location Map of Collection Units B and C
(red nodules and mined red obsidian)

4.1 Lithic Production Systems (The Problem)

Traditional approaches to stone tool analysis have been inadequate when it comes to considering that the structure of assemblages is related not only to the set of activities in which they are directly employed (Shott 1986:16), but also to other components of cultural systems. What is needed is an expanded view of the role of tool assemblages within cultural systems, one which takes into account how these assemblages are adapted to constraints imposed by aspects of cultural systems such as settlement mobility (Binford 1980; Kelly 1980, 1983; Shott 1986:16), the maintenance of social boundaries, and the properties of resources such as their predictability, stability, and mobility (Shott 1986:16).

For the purpose of my research a lithic production system can be defined as total synchronous activities and locations involved in the procurement and modification of a single source-specific lithic material for stone tool manufacture and use in a larger cultural system (Ericson 1982, 1984). Production is seen as a process of material modification with intent to form a particular object. During the course of many stages of production of the material, debitage will be created at the sites of production, which will be indicative of the stages of production (Crabtree 1972). Debitage analysis is a basic technique used in the reconstruction of a lithic production system.

In the context of this thesis, the reconstruction of lithic production systems is fully justified from a phenomenological point of view. The structure of a lithic production system will reveal a great deal about the investment of human energy involved in production and decision making, having economic value. The nature and internal organization of these systems are important to further our understanding of production and resource utilization in the context of procurement, exchange, technology, and social organization.

Reconstruction of a lithic production system can be achieved by adopting the techniques used in reconstructing an exchange system. Production indices are calculated and used like an exchange index to reconstruct a synchronous lithic production system in space (Ericson 1982). For this thesis, I looked at several different locations on Quartz Mountain and formulated the results in three tables (Table 7.2, 7.3, 7.4). Each index has a particular function in reconstructing the amount and location of different stages of production of a specific lithic material.

Past research has found that the morphology and the internal structure of these systems will vary a great deal. Some types of systems are immediately apparent. In some stages production will be restricted to a particular zone. More frequently, reduction is taken to a particular stage in one area and then completed in other areas of the system where the final production is completed at or near the site of consumption and use (Ericson 1984:4). Production can also be quite irregular and dispersed throughout a region. The zone of production can also vary. Some production systems will be centered and restricted to the source; a quarry-based lithic production system. Other systems will extend out into the local area surrounding the source, a local lithic production system. These differences are probably related to quarry ownership and the supply of labor involved in production. Production will frequently occur throughout the entire region, a regional lithic production system. The types of production form a continuum, from terminal to sequential to irregular. Each requiring different energy budgets and varying numbers of producers. The sites of production can occur at the quarry, within the local area, or within the region.

The quarry and its associated workshops are the most important components of a lithic production system. With this in mind, most of the remaining chapters in this thesis will demonstrate the importance of the quarry in understanding lithic production. Past research has found that a number of important activities and associated behavior patterns can be studied directly on the quarry site (Singer and Ericson 1977).

The changes in lithic technology on the quarry workshop can also be studied (Singer & Ericson, 1977). While working at the Bodie Hill quarry in eastern California, Singer and Ericson have been able to link changes in production rates with changes in reduction technology. These changes in production and technology also have been found to occur simultaneously at other quarry workshops in central and eastern California (Ericson 1981, 1982, 1984).

The analysis of the quarry and its associated workshops can provide primary data for determining extraction technology, raw material selection processes, knapping behavior, reduction technology, material products, production rates, changes in technology, and the dynamic stability of production, exchange, and technology over time (Brauner, personal communication, 1996).

4.2 Analysis of Lithic Production Systems

Analysis of a lithic production system cannot begin until an understanding of what is expected to be found at a material source is known. Current research reveals that certain types of artifacts can be found at quarry sites, such as hammerstones, picks, sledges, and wedges. Comparative studies of several assemblages show evidence of quarrying activities containing large amounts of primary reduction debris along with various stages of core reduction (Dibble and Roth 1998).

There will be a large number of cortical flakes, although the amounts of cortex will vary with nodule mass (Butler and May 1984). A large quantity of debris will also be found, along with "rejected" pieces such as broken tools, and thick blades (Dibble and Roth 1998). These sites may also contain worn or broken tools made from non-local materials (Gramly 1980).

With the knowledge of the artifacts that have been found at quarry sites a wide variety of categories have been employed in the analysis of the debitage presumed to have been produced by primary core reduction (Crabtree 1982; Flenniken 1993; Sullivan 1985:756). Many of these non-tool debitage categories are well defined, but they all have something in common; the three basic categories of primary, secondary, and tertiary flakes. They are also frequently accompanied by a residual category called shatter, chunks, or debris (Flenniken 1993; Sullivan 1985:756). Progressively decreasing amounts of cortex distinguish the three categories, with primary flakes having the greatest amount of cortex and tertiary flakes the least. According to some analysts, the categories reflect a very specific sequence of flake removal (Crabtree 1982; Flenniken

1993; McDonald 1985; 63; Muto 1976; Whittaker 1994): primary flakes were removed before secondary and tertiary flakes, and secondary flakes before tertiary flakes. These categories are so unquestioningly accepted that often they are not accompanied by attribute definitions (Stafford 1978:20-22; Sullivan 1985:756-757).

The assumption that these categories represent an invariant sequence of flake removal is imprecise because there is no technological dependency between them and core reduction. For example, primary flakes (flakes that have substantial cortex), may be removed at any point during the reduction sequence. Cortical variation, which is the basis for distinguishing between the non-tool debitage categories, is only indirectly related to technology. The proportion of cortical debitage in an assemblage results from: (1) raw material type and availability; (2) nodule or core size; (3) intensity of reduction; (4) the nature of regional raw material procurement and reduction systems; and (5) stylistic and functional factors (Sullivan, 1985:756). Sullivan (1985:756) and Stafford (1979:111) have come to the conclusion that "primary and secondary flakes were more similar to each other than either was to tertiary flakes" because a variety of independent technological and non-technological factors influence cortical variation. It is misleading to use cortical variation exclusively to describe prehistoric technology from what is found in workshops because we do not know exactly what was taken away and used elsewhere (Sullivan, 1985:756: Brauner, personal communications, 1997).

Debitage analysis that employ categories based on the arbitrary division of cortex are compromised by the consequences of two major operational problems. First, no currently available procedure can reliably replicate the partition of varying expressions of cortex on debitage. Second, because the proportion of cortex that defines a specific debitage category is unstandardized, primary or secondary flakes of one study would be classified as secondary or tertiary flakes in another (Sullivan 1985: 756). This lack of standardization produces a substantial lack of comparability between studies.

Research has also found that non-tool stage typologies cannot accommodate the known range of debitage variation. Their categories are restricted to complete specimens exclusively, but in the real world the majority of the material found is just the opposite. Non-cortical proximal or distal flake fragments, for example, cannot be classified as tertiary flakes because missing portions may well have been cortical. Furthermore, the three debitage categories discussed above do not incorporate criteria that allow classification of proximal flakes (flakes that are broken, but still having platforms), debris (chips or shatter, broken flakes not having platforms), and other types of debitage (Crabtree 1982:9-10).

For this reason I focused on looking at the percentage of bifaces versus cores and core fragments, the types of flakes and, the amount of debris in the analyzing the assemblages obtained during surface collections. The distinction between blade cores and flake cores (biface) was made by looking for scars on possible cores which were the result of removing blades or flakes by applying force from two directions. For bifacial reduction I looked for artifacts bearing flake scars on both faces that were not derived from blade core technology. Color of obsidian was also included in the analysis to determine if red obsidian was used over black obsidian when both were readily available in the same area.

4.3 Experimental Data: Examining Lithic Production Systems

Because production strategies involve complex motor skills easily imparted outside an apprentice-type situation, they are more diagnostic of specific cultural traditions than stylistic phenomena such as design and shape which are easily imitated and disseminated. For this reason, a classification system based on technological considerations is particularly useful to the prehistorian faced with the problem of locating people in time and space on the basis of their artifacts.

In order to bridge the gap between living craftsmen and their prehistoric counterparts, the link between the production process and the resulting artifact morphology must be established. By using controlled experiments with the same tools that were used by early flintknappers, it will be possible to specify how particular technological decisions on the part of a craftsman are recorded in the combination of individual attributes (such as flake scars) and in the sequencing of attributes on the finished experimental artifact. With this type of information I can make educated inferences concerning how prehistoric artifacts were made. Finally, it is possible to use various kinds of information derived from prehistoric artifacts and the environmental data with which they are associated to formulate hypotheses about how the artifacts were used. These inferences about how prehistoric artifacts were made and used can be tested experimentally, and this experimental data fed back into the overall interpretation of the assemblage.

4.4 Lithic Raw-Material Availability

The availability of lithic raw materials has been considered by some researchers to be the most important factor in the organization of technology (Andrefsky 1994:23). The ethnographic record has shown that the availability of lithic raw materials plays a primary role in the amount of effort expended to produce various types of tools. O'Connell's work with the central Australian aborigines has found that variations in the lithic assemblage is primarily due to the availability of lithic raw materials (O'Connell 1977:280; Andrefsky 1994:23).

The archaeological record indicates that prehistoric populations discarded formal tools made of high-quality lithic raw materials when new material sources were found (Andrefsky 1994:23). Gramly (1983) reported what appears to be "dumping" behavior at a small habitation site located just outside of Mount Jasper prehistoric quarry in New Hampshire. What he has found in this situation is that it appears that a prehistoric group traveling from a distant location retooled at the quarry and moved on. In the process, they discarded formal tools, which may have been transported from as far away as northern Maine and New Brunswick (Gramly 1983:826). At this time period it is not known what the circumstances of travel were for the prehistoric population that retooled at Mount Jasper. But, Gramly notes that there wasn't any evidence showing extended periods of habitation. The visit appears to have been primarily for the acquisition of lithic raw material from the nearby quarry (Gramly 1983:825).

One of the outstanding attributes of the ethnographically known desert Aborigines of Australia was their willingness to make long trips for the primary purpose of visiting sacred sites and meeting with members of the patrilineages controlling those sites (Berndt and Berndt 1964:107). It was noted that all-male groups made these trips. Some of these trips covered several hundred kilometers from their home areas. These special, long distance trips were called "panalipi" (translated literally: "all over the earth") and the tracks followed on such trips were a favorite theme for depiction in rock and cave art. Travelers on these trips camped together in distinct, all-male enclaves within the main concentration of campsites occupied by the locally resident population. Such trips established the introductions necessary for later use of the resources of these distinct areas by the visitors with their families, and lithic materials were often obtained and transported over long distances during the course of such trips. These trips were also important for arranging betrothals (Berndt and Berndt 1964:107; Gould and Saggers 1985:122), which in due course would mean that one was also establishing in-law relationships over these same long distances. Such in-law connections involved obligatory sharing of food and access to other resources. This relationship was considered the most strictly observed in their society.

Long-distance trips were therefore of adaptive significance, since they were instrumental in establishing social networks over wide areas of the desert. Lithic procurement occurred not only in the context of day-to-day foraging and resource procurement activities, but also in relation to these special, long-distance trips (Gould and Saggers 1985:122).

While Binford was working with the Nunamiut Eskimo's, he found just the opposite in that raw materials used in the manufacture of implements were normally obtained incidentally to the execution of basic subsistence (Binford 1979), put simply, procurement of raw materials was embedded in the basic subsistence schedules. "*Very rarely, and then only when things have gone wrong, does one go out into the environment for the express and exclusive purpose of obtaining raw material for tools*" (Binford 1979:274).

Binford gives this example:

> A fishing party moves into a camp at Natvatrauk Lake. The days are very warm and the fishing is slow, so some of the men leave the others at the lake fishing while they visit a quarry on Nassaurak Mountain, 3.75 miles to the southeast. They gather some material there and take it up on top of the mountain to reduce it to transportable cores. While making cores they watch over a vast area of the Anaktuvuk Valley for game. If no game is sighted they return to the fishing camp with the cores. If fishing remains poor, they return to the residential camp from which the party originated, carrying the cores. Regardless of the distance of Nassaurak Mountain from the residential camp, what was the procurement cost of the cores? Essentially nothing, since the party carried the lithics in lieu of the fish that they did not catch. They had transport potential, so they made the best use of it; the Eskimo say that only a fool comes home empty handed! (Binford 1979:274).

With increasing environmental changes we would expect to find increased diversity within a group's mobility strategy, such that the seasonal use of a given region could be accomplished through one form of mobility, and the use of another region through a different form (*i.e.* root gathering in the high desert and salmon fishing in the river areas) (Binford 1982: Kelly 1988:301).

Reliance upon plant resources requires not only high residential mobility, but thorough coverage of an area as well, since there is a rapid drop in the utility of commuting long distances for plant foods. Reliance upon fauna allows for a greater expenditure of energy in traveling these great distances; however, it also means that a foraging area will become rapidly depleted of resources. Consequently, residential mobility must also be high, unless storable resources are present. Reduced residential mobility can occur as a response to the need for maintaining extensive mobility or to the need for maintaining continuous observation of a resource (Kelly 1988:301). This would require small groups of individuals to be constantly on the move in order to know when these resource were ready to be harvested (Hunn 1989).

In general, among groups with high residential and low logistical mobility, consumers (family or extended family members) are brought to the location of the food resources. Thus daily food-searching forays are generalized search-and-encounter hunting and gathering forays with a simple structure, involving a limited set of activities (Kelly 1983,1988). Ethnographic data indicate that in systems of high residential and low logistical mobility (Binford 1980) there are few bifacial tools (Kelly 1988:719), and tool needs often are fulfilled expediently. This information suggests that the type and distribution of local raw material is the primary factor affecting the lithic technology of foragers. When raw material is abundant and of adequate edge holding quality there is no temporal or spatial difference in the location of raw material and the location of stone use; in effect, stone tools have no role to play, and we can expect groups living under such conditions to employ an expedient flake technology, with little use of bifaces as cores. For example, Binford (1986) found that among the Alyawara of central Australia many morphological tool types were determined by the locally available material, either chert found in cobbles from stream or outcrops of quartzite (Bedwell 1986:548).

4.5 *Bifacial Core Reduction*

In simple terms a biface is a large flake or core blank that has been reduced on both faces from two parallel but opposing axes through percussion and pressure flaking, and is shaped into a specific form (Crabtree 1982: 16; Kelly 1988: 718: Muto 1976: 55; Whittaker 1994:19). The relatively high-energy investment in a bifacial tool indicates that it is not to be discarded quickly and that its sharpness is important to its role. But what is the specific role of a biface? Binford (1986) found that the Australian Aborigines made almost no use of bifacially flaked implements; in fact it is difficult to find ethnographic accounts of the use of bifaces among hunter-gathers (Kelly 1988:718). The position that I am taking here is that while all bifacial tools are shaped for a deliberate reason, there may have been several different reasons to do so; in other words, bifaces can play one or more of three different organizational roles in a technology.

First, large bifaces can be used as cores as well as tools (Andrefsky 1994: Bedwell 1980; Kelly 1988:718). The flakes driven off a biface are thin and sharp, and, depending on the size of the biface, may be small but still useful. More usable flake edge can be produced from a biface than from a percussion core of similar weight because each flake from a biface has a high edge-to weight ratio (Brauner, personal communication, 1997). The use of bifaces as cores indicates that hunter-gatherers need to be prepared for a variety of tasks requiring stone tools, but can anticipate not knowing exactly how many such tasks will be conducted in the future and that raw material may not be available where the group or individual intends to go. Using large bifaces as cores maximizes the amount of tool edge carried while minimizing the amount of stone, and, by carrying all tools as one solid biface, one can assure that flakes struck from it will have sharp, undamaged edges (Brauner and D.J. Rogers, personal communication, 1997: Kelly 1988:718)

Second, biface tools may be manufactured for their long use life (Kelly 1988:718; Shott 1986). A bifacially flaked edge can have a fair amount of cutting power, the less acute angle of a biface's edge makes it more durable than a non-retouched flake. A completely flaked bifacial tool has a similar micro topography along all its edges; should the tool edge break or become dulled, it can be resharpened relatively easily and continue to be useful. Within limits set by the raw material, a bifacial form simultaneously gives a tool sharpness, durability, and potential to be resharpened. Additionally, the generalized form of a biface allows it to be modified into other tools, such as scrapers (Kelly 1988:718; D.J. Rogers, personal communication, 1997).

Lastly, a tool may become bifacial largely as a by-product of stylistic or sharping concerns, an epiphenomenon of creating a tool which is distinctive to its manufacturer or its manufacturer's social group. Such tools could include projectile points, and may be produced by specialists (Kelly 1988:718). Similarly, a stone may be worked bifacially in order to fit it to a preexisting haft (Whittaker 1994:288). Kelly (1988) notes that most hafts were made from organic materials, that were more difficult and time consuming to manufacture than the stone tools which they hold; consequently, the tool must fit to the haft rather than vice versa. Not all hafted stone tools are bifacial (Flenniken 1981, 1991: Kelly 1988), but for those stone tools which have become bifacial as a function of their having been shaped to fit a haft, bifacial flaking is not as necessary to their intrinsic function as it is for the other two types of bifaces.

4.6 Blade Core Reduction

Blade core reduction is the processes of developing a ridge system for the blades to follow. Blades made from blade cores are parallel-sided flakes that are twice as long as they are wide with one face being smooth and the other faceted with a few long surfaces. These flakes were subsequently used as knives or made into blanks from which many different specialized tools could be made Once the first blade is successfully detached, the edges of its flake scar form ridges that other blades can follow, and if the core is of good quality and the knapper is skilled, it is possible to work around and around a core, removing blades (Figure 4.3). This is a very efficient use of material; more edge per pound can be made by blades than by any other method (Brauner, personal communication, 1996; Muto 1972; Whittaker 1994).

With the blades that are produced from this technique a variety of tools can be made ranging from finished projectile points to steep end scrapers. The only drawback to this technology is that blades tend to break easier than points made from the biface methodology and they tend to dull much more easily and require re-sharpening (Brauner and D.J. Rogers, personal communication, 1997). Blade cores are usually made from flint or obsidian.

There is currently a debate going on among archaeologists concerning the relationship between mobility and technology. Bifacial tools or cores are generally associated with frequent movements between residential areas and/or lengthy logistical movements, while blade core flake tools are associated with longer residential periods and/or infrequent residential moves (Kelly 1992).

Blade core technology has been associated with early sites throughout North America. This early tool technology has been found in association with big game hunting and the use of the atlatl or spear throwers. The peoples who used this technology were likely only traveling short distances and using the tools as needed (Parry and Kelly 1987).

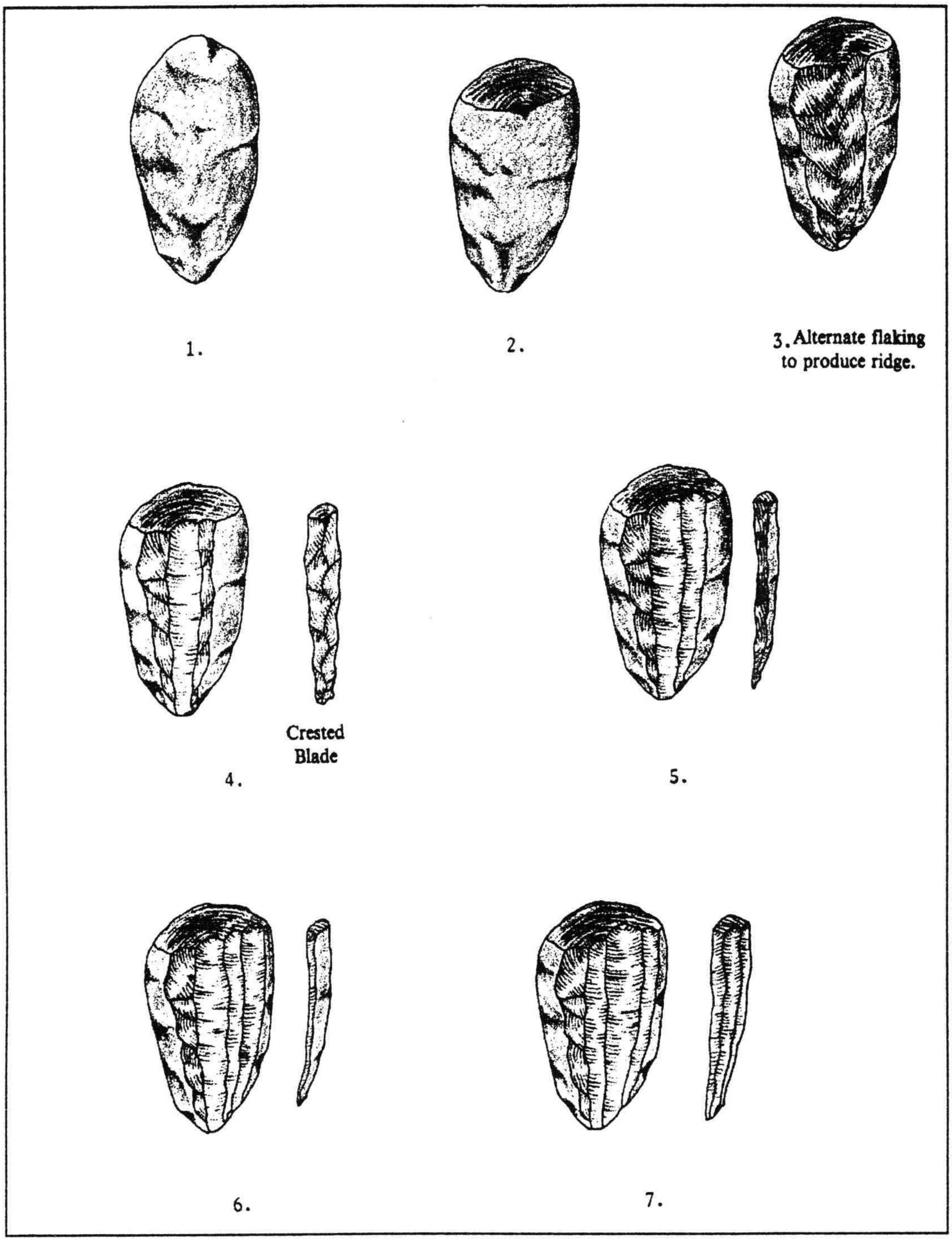


Figure 4.3 Blade Core Methodology. Blade core reduction methodology found on Quartz Mountain. Sequence of core and blade manufacture (adapted from Crabtree 1982).

5. The Regional Lithic Resource Base of the Central Oregon Area

An important factor in trying to understand procurement and production is to understand the regional lithic resource base (Figure 5.1). For the most part, researchers are only interested in the dominant lithic material at a site or those materials transported long distances as exchange items. For a stone-tool-using society it is important to understand the structure of the lithic resource base. Preliminary work done by Wright in 1974 found the need existed to consider alternative lithic materials in reconstructing prehistoric exchange systems. The location of and distance to alternative lithic resources affect the morphological characteristics of obsidian exchange systems (Ericson 1977, 1981, 1984). Reconstruction of the regional lithic resource base will allow researchers to account for this type of interaction and other processes that are involved in procurement.

Further research in lithic reduction methodology should also include variables related to technology and function. For example, different materials often appear in different categories of function and tool typology. This is particularly the case in areas where there is a great diversity of rock types. Since the physical properties of obsidian are quite variable, these properties most often play an important role in the processes of selection and tool function. Although the importance of physical properties on selection of stone tool material has been discussed (Goodman 1944, Ericson & Singer 1977, Ericson, 1984: 6), these relationships have not been adequately demonstrated. For this reason, one goal of my thesis is to sample the material mined at Quartz Mountain and try to reproduce usable tools from this material to see if the material can be worked and if differences between veins and cobbles may account for differences in use.

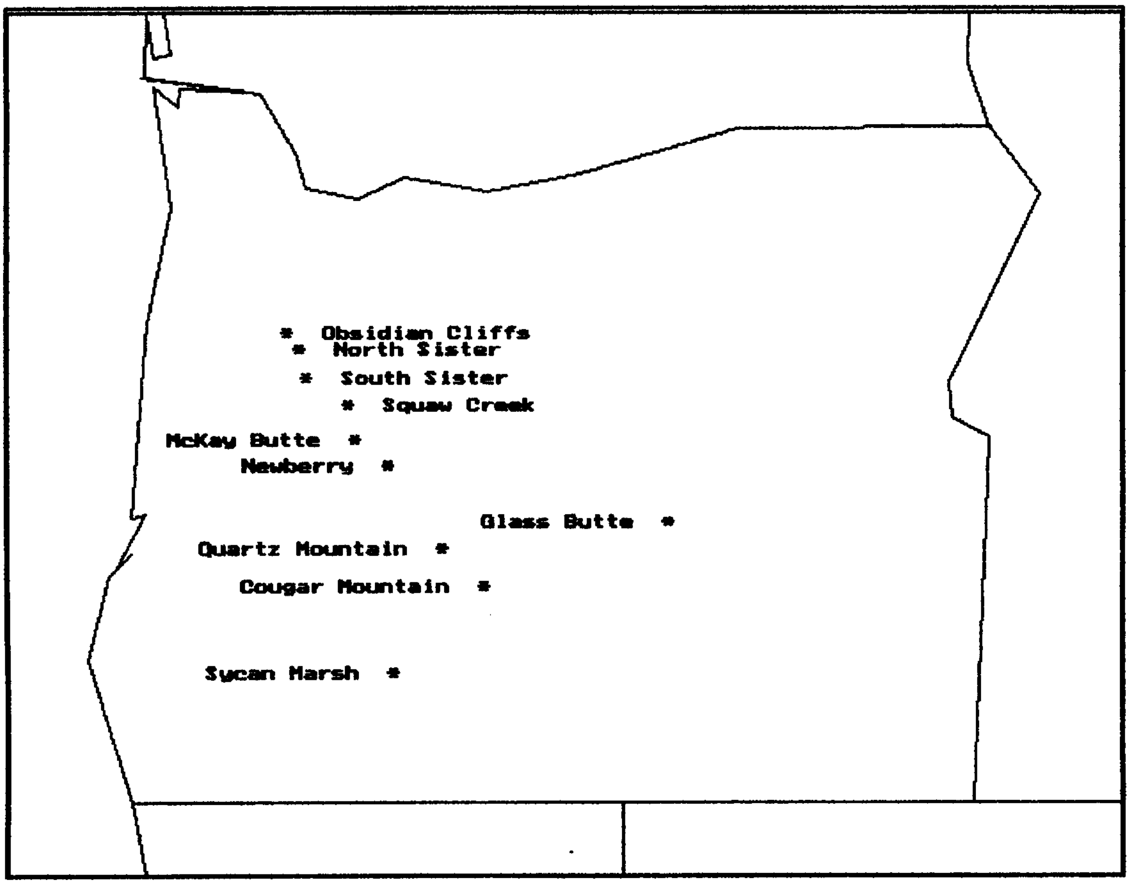


Figure 5.1 Material Sources. Map showing approximate locations of all known material sources in the Central Oregon area known by the author.

6. Research Methods

To address the production systems used on Quartz Mountain, I did surface collections and analyzed the recovered material using the indices mentioned earlier, and did an extensive literature search to see which reduction strategies applied to Quartz Mountain.

I found that archaeologists have traditionally resorted to the use of two types of analogs in classifying and interpreting flaked stone artifacts: (1) ethnographic and experimental analogs based on primary observations, and (2) analogs based on inferences made in modern and prehistoric contexts. For my research I will look at ethnographic and experimental analogs, as they provide the interpretive framework for reconstructing the prehistoric use of Quartz Mountain.

The cultural material recovered from the surface was acquired through controlled surface collection. Artifacts collected were labeled and later analyzed. The artifacts collected during the surface collection appear to be a representative sample of those observed during the initial survey.

To obtain a controlled surface collection, two metal spikes were first established as datums on one of the upper terraces of the site. This was done to establish semi-permanent reference points for the laser transit. The area surrounding these datums were then recorded, with special interest given to large debitage concentrations and the elevations of material mining areas. After the survey was completed and the resulting map was produced, two areas were selected for the surface collection. These areas were chosen after the survey was completed and all areas were examined and broken down into respective categories, (e.g. areas where obsidian was found mined out of the rhyolite with cobbles and large block cobbles eroding out the hillside). The areas were then reexamined on the ground and the collections units were then chosen by their ability to answer the research questions.

Three one-by-one meter units were collected. These collection units were randomly chosen by a lottery method (all workshop areas were given numbers and placed into a box and randomly drawn in this method). After the reduction areas were chosen, the area was broken down again into one-by-one meter collection units. All the material that was collected from the three collections units were placed into paper bags with GPS locations and site specific information on them.

Figure 6.1 Collection Unit A. This area is predominately black obsidian reduced from the large cobbles eroding out of the hillside.

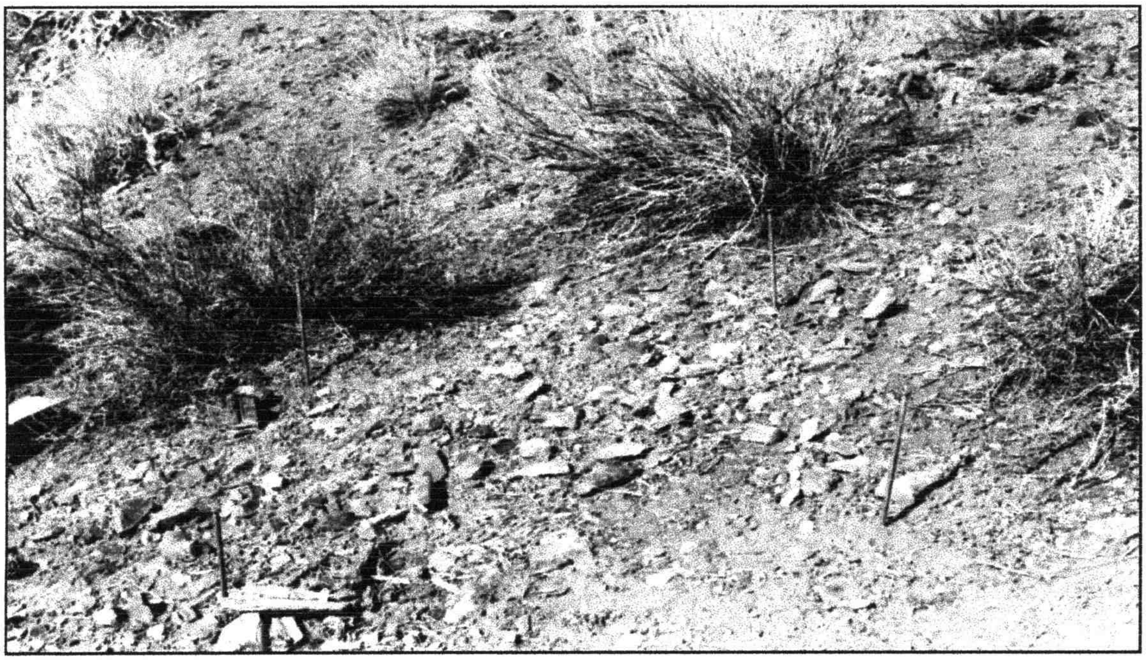


Figure 6.2 Collection unit B. This site is predominately red/black obsidian.

Figure 6.3 Collection unit C. This area is primarily red/black obsidian, although some of the red/cobbles were utilized.

Collection unit A (Figure 6.1) was located in the site area 2002 A, GPS location 43 degrees 36 minutes 23 seconds north, 120 degrees 53 minutes 95 seconds west . This area I felt best represented the material (large block) and technology that was typical of the lower portion of Quartz Mountain. A datum was established and a one-by-one meter collection unit was laid out, and all the material was collected from the surface.

Collection units B and C were located in an area which contained several lithic reduction areas. Collection unit B (Figure 6.2) was located (GPS location) 43 degrees 36 minutes 90 seconds north, 120 degrees 55 minutes 94 seconds west. Collection unit C (Figure 6.3) was located (GPS location) 43 degrees 36 minutes 90 seconds north, 120 degrees 55 minutes 91 seconds west.

The raw material that was collected for the lithic reduction experiment was collected in such a matter as to not disturb the sites' integrity. The cobbles were collected from the material displaced by the construction of the 2269 road. The material that was taken from the rhyolite veins was also collected in such a manor as to not disturb the surrounding veins. The tools used were the same tools available to the Native Americans: rock hammers, antler hammers, and antler chisels. After several attempts to remove obsidian from the veins failed, another method was tried. This method involved taking a hammer stone and tapping the obsidian close to natural flaws. This method worked well, and several large pieces were removed without any damage to the surrounding obsidian.

7. Results

7.1 Survey Results

My survey of Quartz Mountain identified five extensive areas of quarrying which I have broken down into four sites (35DS2001-35DS2004). These sites cover vast amounts of surface area (Figure 7.1) and consist of large amounts of raw obsidian and extensive amounts of lithic debris. The amount of debris ranges from 500+ flakes per square meter to 10+ flakes per square meter on the fringes of the sites.

The survey also found that Quartz Mountain has been logged at least three times in the past; the most recent is ongoing. The damage to the sites is extensive and can no longer be tolerated. Skid trails made by bulldozers have caused extensive damage to several sites and large slash piles that have burned have caused the obsidian to turn frothy in some cases.

7.2 Surface Collection

The material that was collected was broken down into separate categories as follows: Blade cores (cores that were used to produce blades) blade core fragments (cores or fragments of a core, but not usable), complete tools (usable tools), proximal end flakes (flake that have the platform but is broken), complete flakes (flakes that are twice as long as they are wide), Bifaces (large flakes or long flat cobble that have flakes taken off both sides), and debris (chunks that are too badly broken to tell exactly what they were).

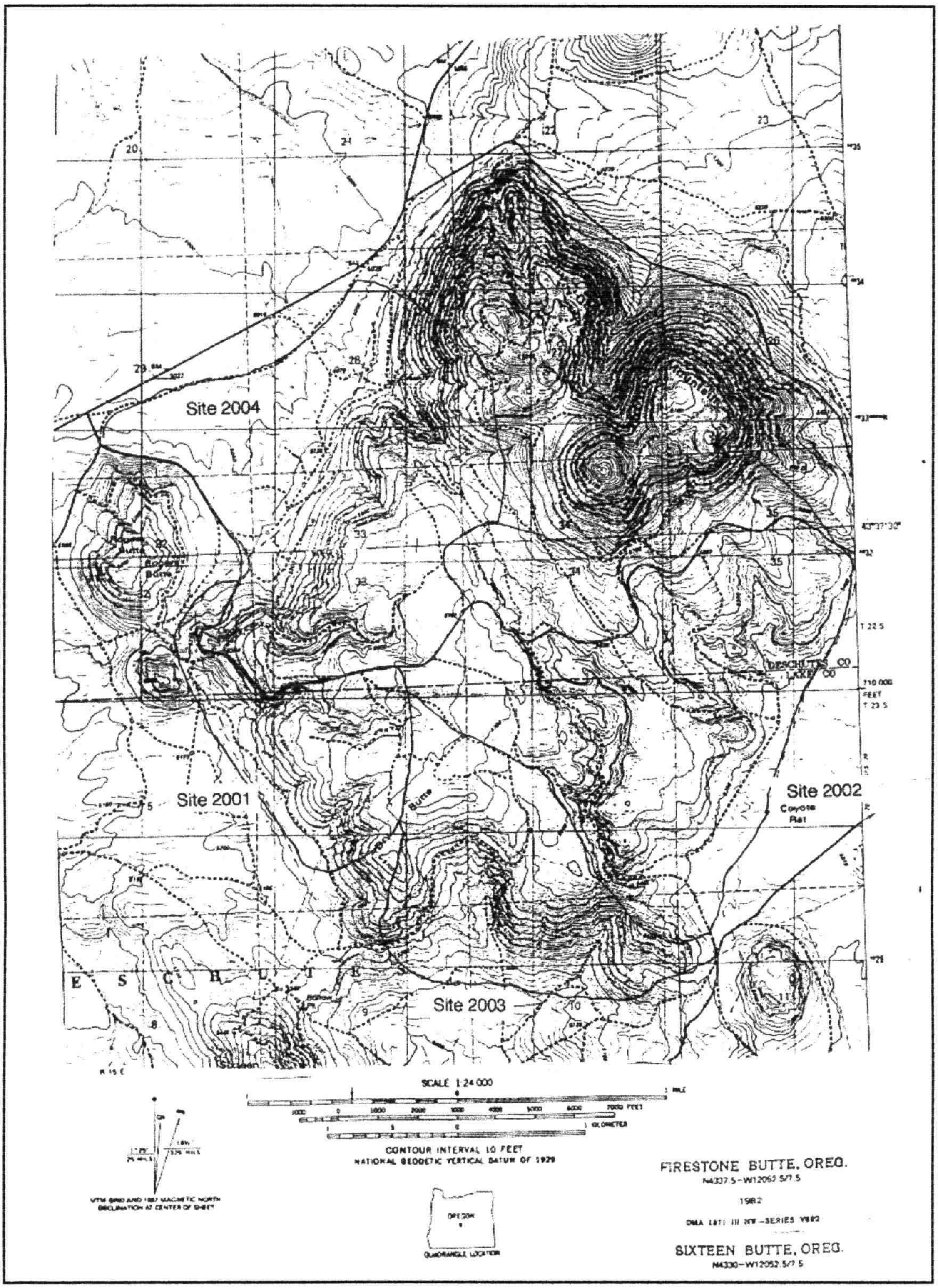
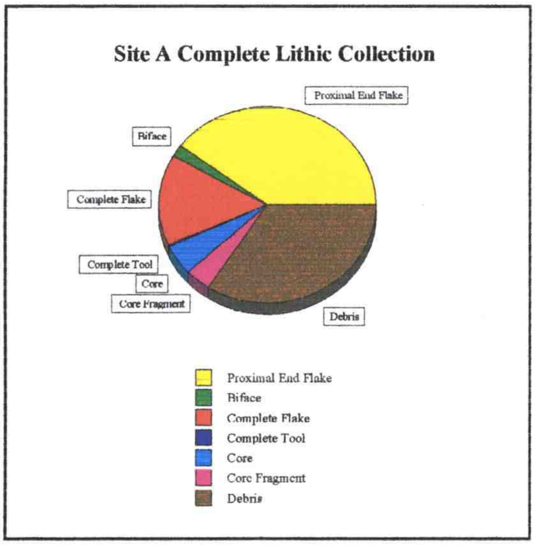


Figure 7.1 Site Map. Map showing site distribution on Quartz Mountain



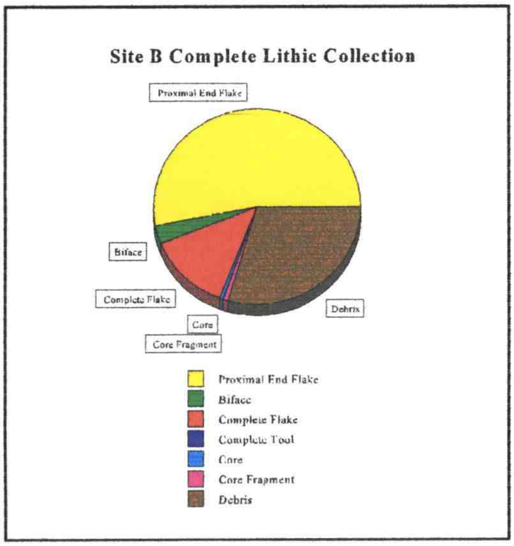
Artifacts for Site A:	**No.**	
Proximal End Flake	214	40%
Biface	11	2%
Complete Flake	78	15%
Complete Tool	1	.2%
Blade Core	25	5%
Blade Core Fragment	21	4%
Debris	181	34%

Figure 7.2 Quartz Mountain Site A Collection

The material collected from Collection Unit A (1 x 1m) consisted of one complete blade artifact (.2%), 11 bifaces (2%), 78 complete flakes (15%), 214 proximal end flakes (40%), 25 blade cores (5%), 21 blade core fragments (4%), and 181 pieces of debris (34%).

The material gathered at Collection Unit A indicates that two distinct tool reduction methods are taking place within this area: blade core and biface. The high percentage of proximal end flakes and complete flakes could be produced by both reduction methods. The cores and core fragments both indicate that blade core reduction was taking place as well as bifacial reduction. The debris is also a byproduct of both technologies. The presence of 25 blade cores and 21 blade core fragments compared to 11 bifaces suggest that blade core reduction was being used more extensively then bifacial reduction. However, the lower percentage of rejected bifaces and rejected biface does not mean that bifacial reduction methodology was used less. At this time we have know way of knowing what was taken away and reduced in to tools.

Collection Unit A contained predominately black (54%) and red/black (46%) obsidian. This is not surprising, as this area contains predominately black obsidian found in large blocks with some areas of red/black obsidian found in rhyolite outcrops.



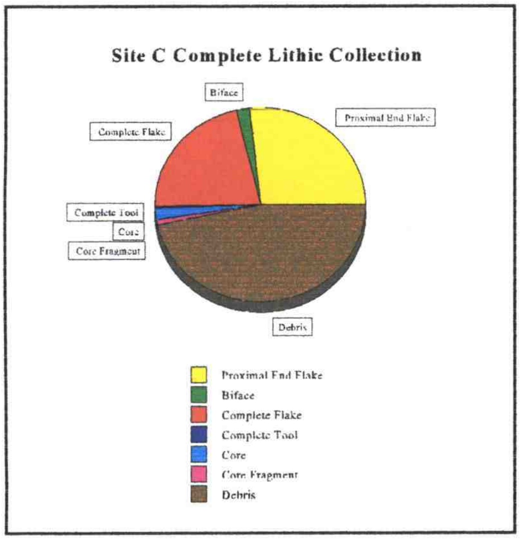
Artifacts for Site B:	No.	Percent
Proximal End Flake	150	53%
Biface	9	3%
Complete Flake	38	13%
Complete Tool	0	
Blade Core	1	.4%
Blade Core Fragment	4	1%
Debris	81	29%

Figure 7.3 Quartz Mountain Site B Collection

The material collected from Collection Unit B consists of no complete tools, 9 bifaces (3%), 1 blade core (.4), 4 blade core fragments (1%), 38 complete flakes (13%), 150 proximal end flakes (53%), and 81 pieces of debris (29%).

The material collected in Collection Unit B is a little different than Unit A, but with the presence of bifaces, blade cores, and blade core fragments, both technologies were being done within the same space. Here again the high percentage of proximal end flakes as well as complete flakes (53% and 13% respectively) could be produced with both technologies.

For Collection Unit B the flake evidence shows a higher percentage of red/black obsidian (88%), with less black obsidian (12%). This area also has a large amount of black obsidian that occurs in fist-sized and larger cobbles covered with cortex. The higher percent of red/black flaking debris indicates that the red/black obsidian was preferred over the black cobbles.



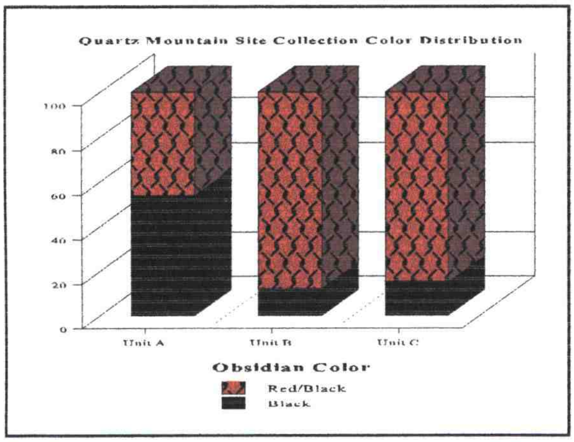
Artifacts for Site C:	No.	Percent
Proximal End Flake	69	27%
Biface	5	2%
Complete Flake	55	22%
Complete Tool	1	.4%
Blade Core	4	2%
Blade Core Fragment	2	.8%
Debris	120	47%

Figure 7.4 Quartz Mountain Site C Collection

The material collected from Collection Unit C (Figure 7.4) consisted of 1 complete tool (.4%), 5 bifaces (2%), 4 blade cores (2%), 2 blade core fragments (.8%), 55 complete flakes (22%), 69 proximal end flakes (27%), and 120 pieces of debris (47%).

The material found at collection unit C is similar to collection unit A and B in that bifaces, blade cores and blade core fragments are present indicating both technologies were again taking place in the same space.

For Collection Unit C the flake evidence shows a higher percentage of red/black obsidian (85%), with less black obsidian (15%). This area like that of Collection Unit B has a large amount of fist-sized and larger cobbles covered with cortex. The higher percent of red/black flaking debris indicates that the red/black obsidian was preferred over the black cobbles.



Site	Color	No.	Percent
A	Black	285	54%
A	Red/Black	246	46%
B	Black	34	12%
B	Red/Black	249	88%
C	Black	39	15%
C	Red/Black	217	85%

Figure 7.5 Quartz Mountain Collection Color Distribution

In summary, the color distribution (Figure 7.5) indicates that the material on hand is being used. The area around Collection Units B and C has a higher percentage of red/black obsidian than that of Collection Unit A, in that high grade red/black obsidian was obtainable in the rhyolite outcrops. The high amounts of mining back this up, whereas collection unit A indicates that the large black obsidian was preferred over the smaller red/black rhyolite outcrops.

7.3 Blade Core Replication Experiment

In an attempt to gain further understanding of the aboriginal blade core reduction methodology, a replication experiment was conducted. The experiment was preformed by Alan Greenfield and myself. This experiment involved the replication of a blade core and blades to see if there were differences (or if what was produced was similar) in the material that was recovered from the three collections areas. Afterwards the blades were reduced down into usable bifaces to see how they compared with the discarded bifaces found in the collection areas. This was done to determine the workability of the raw material from these locations.

The artifacts from the lithic experiment were compared to the other three collection artifacts to see if there was any correlation between what was observed at the collection sites and what was produced, during blade core reduction.

The experiment, although lacking in respect that I did not attempt to produce any bifaces or preforms from blade flakes, has several areas where similarities do exist and that is in the area of proximal end flakes and debris. Since I was only using blade core reduction methodology the numbers are similar in that respect (the percentage should be similar). But here again it must be noted that I was not trying to produce a biface or a blade preform, and we have no idea how much material was actually taken away from the source by the early craftsmen.

Method of manufacture: Flake reduction using direct freehand percussion.

Stages of manufacture: The core reduction experiment was conducted by myself by reducing two cobbles of average size. The material was collected and analyzed using the same methodology used to analyze the material collected from the three collection units. The second part of this experiment was carried out by Alan Greenfield and myself. This involved using material gathered at the site that best represented the materials that were being utilized by the aboriginal knappers. Both cobbles and material from the veins were collected.

Two blade cores were reduced to the approximate size that were found on Quartz Mountain. A total of 20 proximal end flakes (40%), 2 complete flakes (.4%), 2 blade cores (.4%), 10 blade core fragments (20%), and 16 pieces of debris (30%) were collected after this core reduction was done. Some differences between these remains and the collection units were found, primarily in the amount of cortex. This could be explained by the fact that my experiment consisted of only the decortication process and no further reduction was conducted, whereas the aboriginal knapper was doing more than just making blades; he was reducing his material into workable preforms or blanks that would later be reduced into finished tools at another location other than the quarry (Muto 1976:136). One other possibility for the difference in the amount of cortex is that the aboriginal knapper may have taken the first blades struck from the core to reduce them into preforms or tools.

The results of the raw material experiment was that the red/black obsidian found in nodule form was workable, but had some limitations. It pressure-flaked like pie crust, meaning it was hard to make nice long pressure flakes. The material found in the veins was of somewhat better quality, but like the nodules was hard to finish and was found to not have as sharp a cutting edge. The predominant black obsidian found at other places on the mountain is a higher quality obsidian and works down into finely finished tools that have very sharp cutting edges.

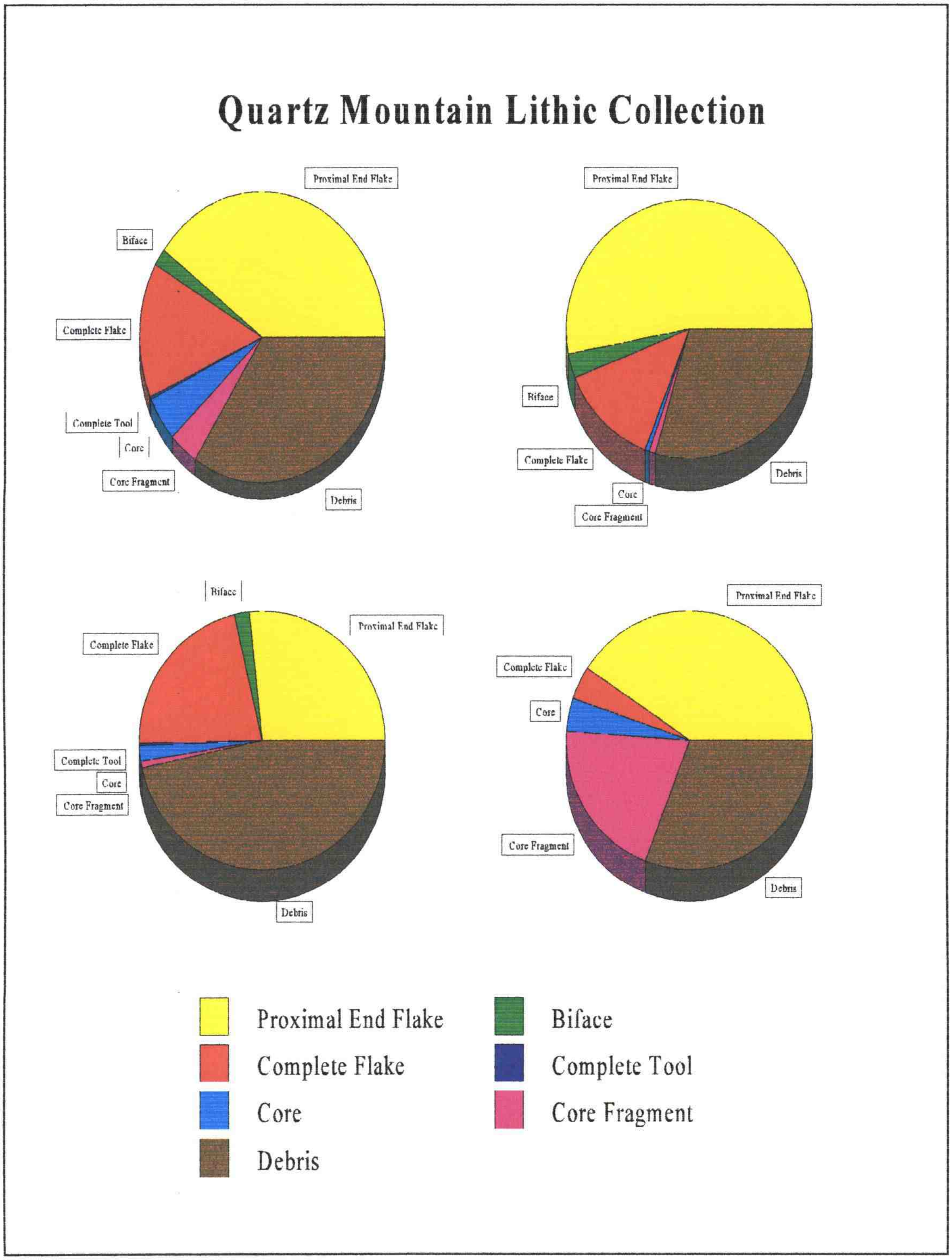


Figure 7.7 Lithic Collection Comparison Chart

7.6 Summary

The results of my surface collection indicate that there were two different reduction systems taking place on Quartz Mountain: blade core (Figure 7.2) and bifacial reduction (Figure 7.3). Both of these reduction processes were taking place in the same areas, but it is impossible to tell if they were done at the same or different time periods. The lithic evidence suggests that hard hammer percussion flaking and soft hammer billet were the only activities taking place.

The evidence for this is that a close examination of all the artifacts show pronounced bulbs and diffused force rings, both of which indicate that some degree of force was being applied. If finish work was being done at these sites, we would see smaller complete flakes with less pronounced bulbs of force and evidence of platform preparation.

None of this was found in my analysis of Quartz Mountain material, although the presence of broken bifacial preforms show that edge grinding was done to strengthen the edges for the next set of flakes. Due to the lack of finished tools or finish flakes recovered during the surface collections, the evidence suggests that the knappers were taking bifacial preforms and blades to other locations and doing finish work there as needed. This evidence has been found at occupation sites on the Deschutes and Ochoco National Forests, where finished artifacts as well as finish flakes are present.

The illustrations in this chapter (Figure 7.8 through 7.42) are typical of the reduction materials found over the Quartz Mountain complex. Certain inferences about the technological function and path position in the reduction processes can be made from this evidence. These initial inferences are combined with verbal descriptions in the second part of this chapter.

This pictorial presentation was chosen as the best form of verifiable data in a published paper form, although all of these artifacts were not collected, but all were represented in the materials that were collected. The catalog numbers and other pertinent information are included in the figure captions.

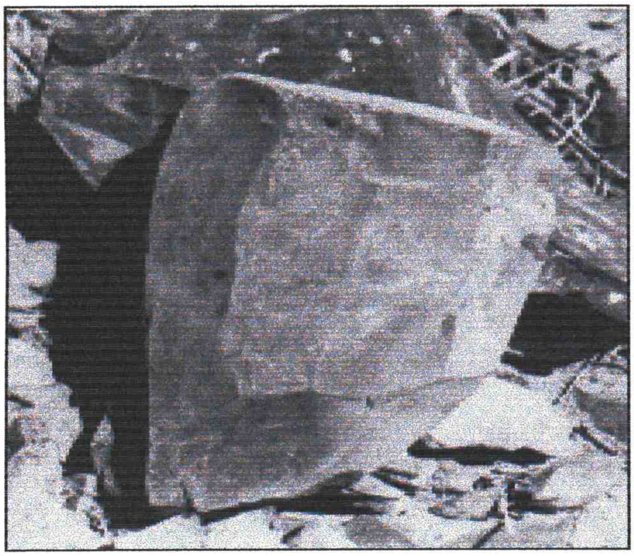


Figure 7.8 Black Obsidian Core. Blade core reduction method of reducing material on Quartz Mountain. (No scale)

Figure 7.9 Rare Large Biface. Large biface found on Quartz Mountain.

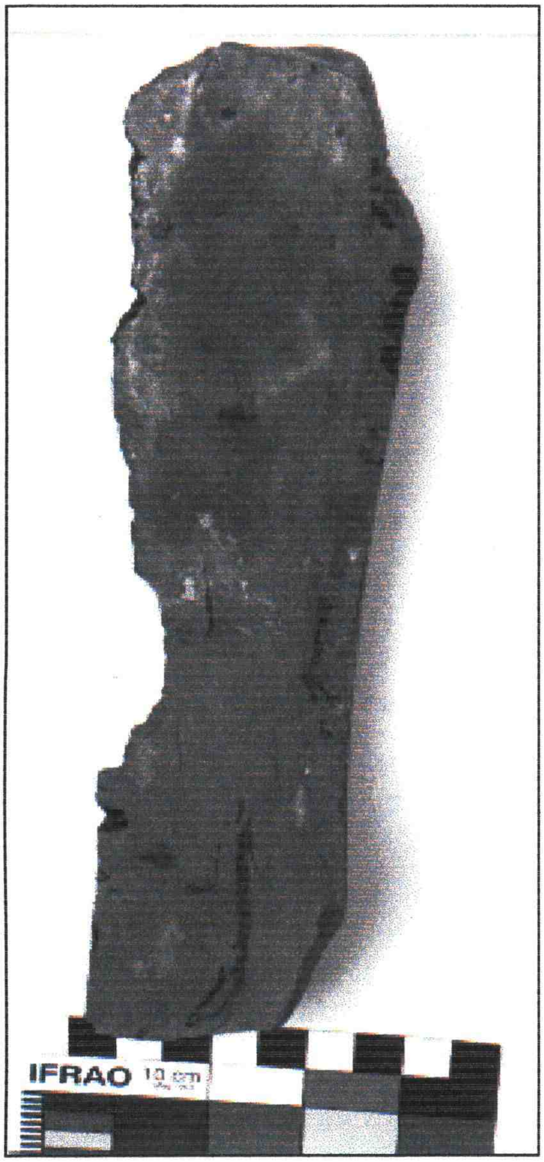


Figure 7.10 (a) Blade Flake Ventral Side. Both sides of this large blade flake are heavily weathering (Not collected).

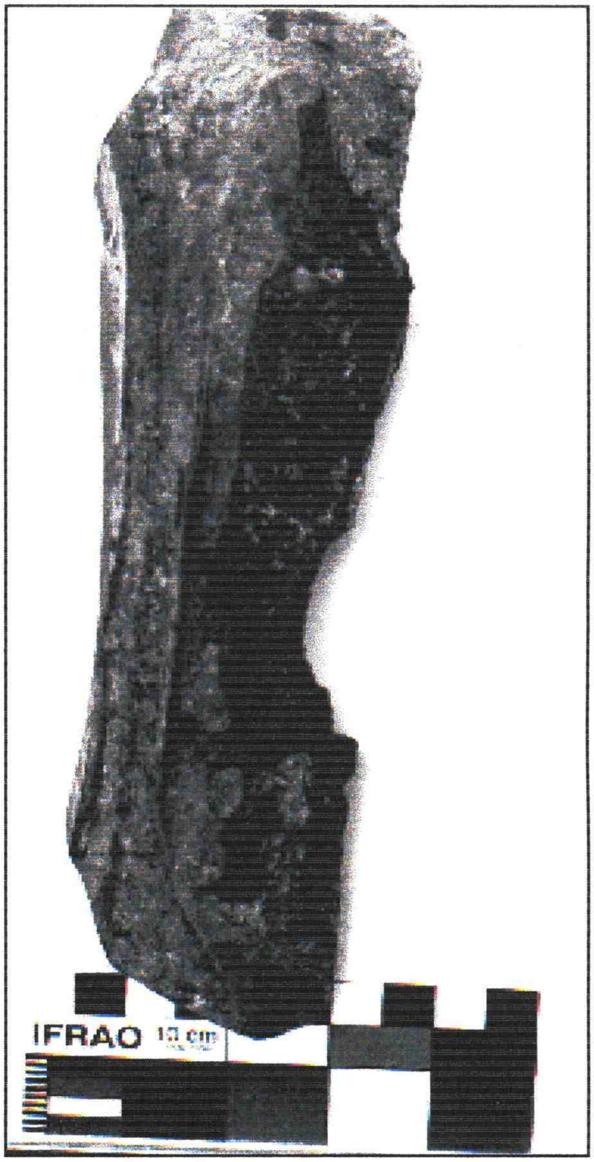


Figure 7.10 (b) Blade Flake Dorsal Side. Both sides of this large blade flake are heavily weathering (Not collected).

Figure 7.11 (a) Black Obsidian Reject. Blade biface. Dorsal side.

Figure 7.11 (b) Black Obsidian Reject. Blade biface. Ventral side

Figure 7.11 (c) Reject Platform. Platform of rejected blade flake showing several failed attempts at basal thinning.

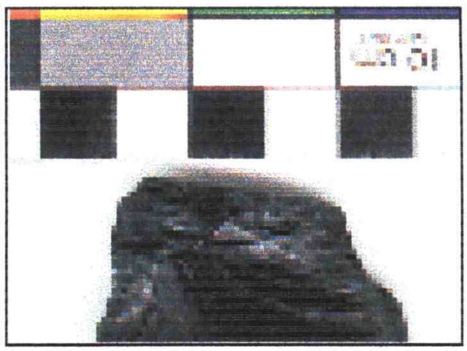


Figure 7.11 (d) Reject Platform. Platform of rejected blade biface showing edge preparation.

Figure 7.12 (a) Red Blade Flake. Dorsal side of large blade flake, with cortex.

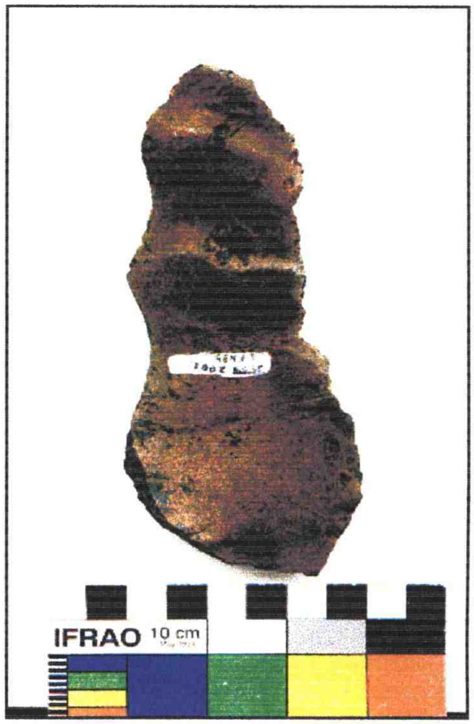


Figure 7.12 (b) Red Blade Flake. Ventral side of large red obsidian blade flake.

Figure 7.12 (c) Red Blade Platform. Platform showing edge preparation.

Figure 7.13 (a) Black Obsidian Knife. Dorsal side of large utilized knife showing heavy hydration. Found at collection site A.

Figure 7.13 (b) Ventral side of finished knife.

Figure 7.13 (c) Black Obsidian Knife Platform. Platform shows signs of edge grinding.

Figure 7.14 (a) Blade Biface Ventral Side. Large blade style biface found at collection site A.

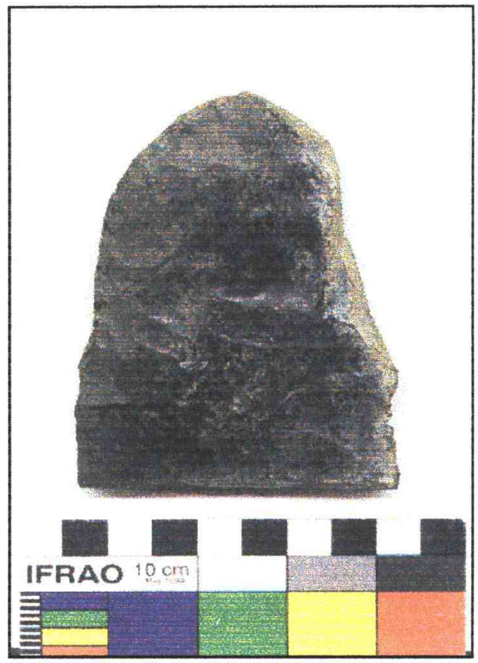


Figure 7.14 (b) Blade Biface Dorsal Side. Blade style biface. Note heavy hydration.

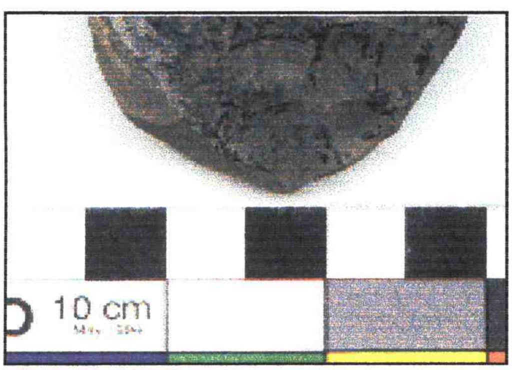


Figure 7.14 (c) Strike Off Platform. This enlarged area shows the striking platform of the blade style flake.

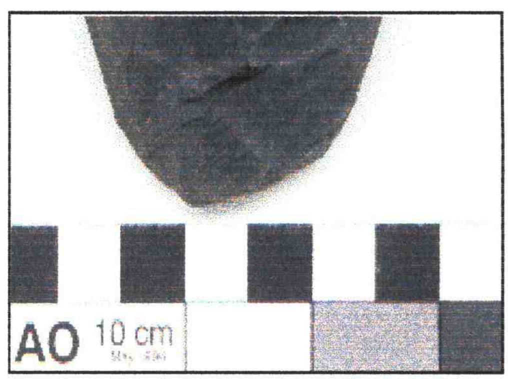


Figure 7.14 (d) Edge preparation.

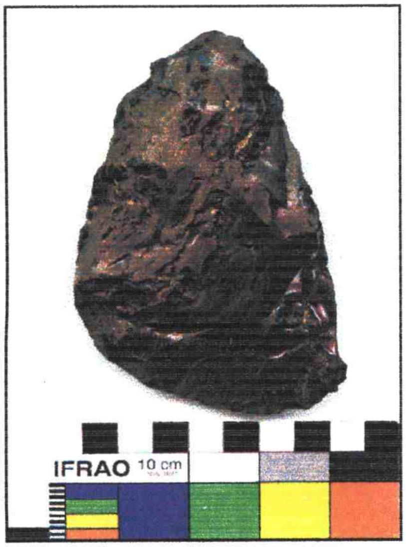


Figure 7.17 (a) Red Biface. The craftsman started making this biface out of the small cortex covered nodule found in the same area as the red/black obsidian that was heavily mined.

Figure 7.17 (b) Red Biface. Reverse side of large red biface.

Figure 7.17 (c) Red Biface. This enlarged view shows the cortex exterior of the nodule. This biface indicates that nodules were being used as well as the material that was mined.

Figure 7.18 (a) Bifacial Thinning Flake. Dorsal side of large bifacial thinning flake. Found at collection site A.

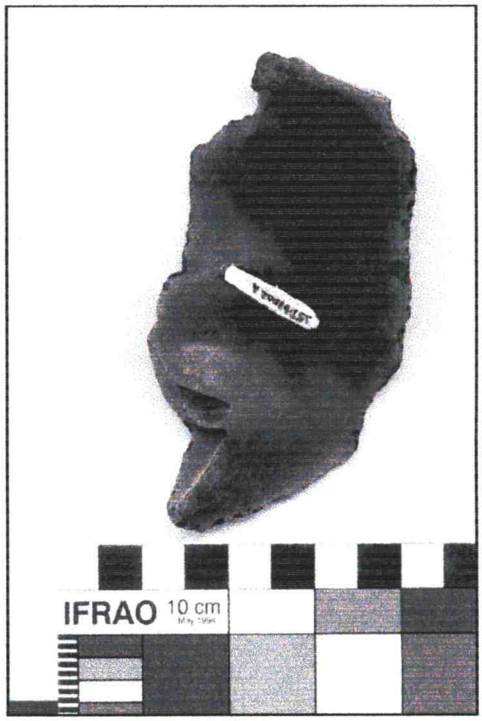


Figure 7.18 (b) Bifacial Thinning Flake. Ventral side of large bifacial thinning flake

Figure 7.18 (c) Ventral side showing platform and edge grinding.

Figure 7.19 Basalt Hammerstone. This hammerstone was found at the base of the rhyolite red/black outcropping. The stone is made of water rounded basalt. This hammerstone shows extensive use. (Not collected)

Figure 7.20 Basalt Hammerstone. This hammerstone was found in the area were the red/black obsidian was mined. The stone was made out of water rounded basalt, which is not found locally. (Not collected)

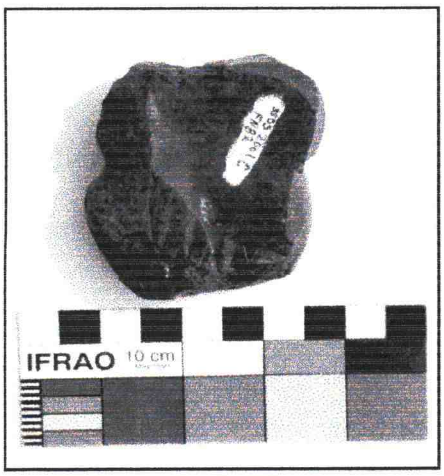


Figure 7.21 (a) Red Obsidian Hammerstone. Small red obsidian hammerstone. Both ends show signs of battering.

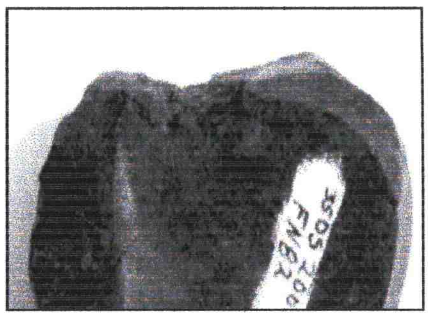


Figure 7.21 (b) Red Obsidian Hammerstone. Red obsidian hammerstone enlarged to show battering.

8 Conclusion

8.1 Discussion

Given the previously cited studies on blade cores and bifacial cores, blade cores should be associated with less residentially mobile sites, and bifacial cores should be associated with more mobile sites. Bifacial cores do not include hafted bifaces (projectile points) or bifacial drills, but all other forms of bifaces such as preforms are included in the bifacial core group.

My research has found that for many years, archaeologists have measured the size of prehistoric foraging territories and thus the degree of mobility through the distribution of stone tools relative to the geologic sources of their raw material (Kelly 1992:55). Clovis and Folsom projectile points, for example, have been found 100-300 km from their sources. Some archaeologists postulate that this indicates high residential mobility. Such information provides a rough indicator only of range, rather than mobility, since the raw material could have been acquired through residential or logistical movements or trade (Hunn 1989:224; Kelly 1992,55).

My research has also found that some archaeologists have tried to reconstruct mobility by examining the organization of stone tool technologies (Ammerman 1974; Andrefsky 1994; Bamforth 1986,1991; Binford 1979, 1980; Nelson 1991; Shott 1986; *et al.*). The organization of technology refers to the selection and integration of stages for making, using, transporting, and discarding tools and materials needed for their maintenance. Many factors affect tool production, use, and discard, but currently the relationship between availability of raw material, technology and mobility takes precedence in this research.

Among some archaeologists there is an ongoing debate on the relationship between mobility and technology. Bifacial tools or cores are generally associated with frequent and or lengthy residential or logistical movements (Kelly 1988, 1992:55), while expedient (blade core reduction) flake tools and bipolar reduction are associated with infrequent residential moves (Kelly 1992:55). However, the distribution of lithic raw material could alter these associations significantly (Andrefsky 1994; Bamforth 1986). Other researchers focus on the statistical relationship between tool assemblage size and diversity (Shott 1986). Shott suggest that collectors produce assemblages with no correlation while foragers produce assemblages with a strong positive correlation (tool designed for a specific task), and he also suggests that there should be an inverse relationship between technological diversity and residential mobility (Shott 1986). Torrence (1989) argues that technological diversity relates directly to the degree of risk involved in prey capture rather than mobility per se.

My research has found that trying to reconstruct mobility strategies from prehistoric technologies is hampered by several difficulties. One of these is that there is no simple relationship between mobility and tool manufacture. Many other variables intervene, such as tool function, raw material type, raw material workability, and distribution of sources. Another is the reconstruction of different tool manufacturing methods from debitage (which I have done with the three collection sites) which is overwhelmed with interpretive difficulties. Lastly, stone tools are not routinely used to a significant extent by any living foragers, making it difficult to test ideas relating stone tools to mobility. Analyses of ethnographic data often make the unverified assumption that as the total technology goes (including its organic parts, usually absent) so goes the stone tool component (Kelly 1992:56). What I see from my research is that at present anyway, many interpretations of stone tool assemblages as indicators of mobility are subjective, intuitive, and most of the time contradictory. What I see at Quartz Mountain and in other site reports from the Deschutes and Ochoco National Forests is that blade core technology was being used by highly mobile groups for many years, as was bifacial core reduction. Both methods were used at the same time in the same site. There is no real way to determine from the lithic evidence wether blade core reduction or bifacial core reduction was going on first or whether the same craftsman was making biface cores for himself and then producing blade preforms for trade, as was found at Lava Island (Minor and Toepel 1982) and the China Hat cache.

I feel that Binford sums it up the best with his statement:

> There is a generic relation between archaeologists' observations on living systems and the interpretative tools they use for inferring the character of past dynamics. If we bring these interpretative tools to bear in a test case, a situation in which both patterning archaeologists might see and the causes of patterning we would infer are known, then we clearly have the opportunity to test the validity of the principles standing behind our inferential arguments. This is very different from a cautionary tale, which frequently takes the form of an object lesson to archaeologists suggesting that the archaeological record is limited and not capable of yielding information about one or another form of "ethnographic reality" (Binford, 1986:555). I have suggested many times (Binford 1984b) that the testing of the validity of our interpretive principles must be made in actual situations in which the dynamic (causal) and static (derivative) effects are both observable, if our inferential techniques and conventions lead to false interpretations when applied to a test case, then we learn something of the limitations of these techniques, and concepts (Binford, 1986:555).

8.2 Summary

In order to understand what was occurring at Quartz Mountain, one must look at the Fort Rock Basin as a whole. By looking at the climatic conditions for the whole area a clearer picture comes to mind of the different lithic strategies due to different mobility strategies.

In review of the different periods, the following climatic picture is from around 13,000 to 3,000 B.P. Initially, the Fort Rock Basin contained a single lake with the shoreline elevation at 4,386 feet (Bedwell 1973:67). From all indications the lake was probably in a declining state during this time period (13,000 B.P.). The temperature was probably four to five degrees colder than present, and precipitation was much greater (present annual rainfall is sixteen inches per year). Lodgepole and western white pine were predominant in the area, existing at much lower elevations than at present. Animals were numerous in the area, and these would include now-extinct forms of herbivores, although some of these forms apparently were not as abundant in the area as in other parts of the continent (Bedwell 1973:67; Cressman 1942:17). The reason why there weren't as many large herbivores in the area is that previously the area might have been more heavily forested and provided less open grassland for grazing animals. In any event, this period was one of cool temperatures, abundant moisture, lakes, and forests.

Reduction of the Fort Rock Lake continued, and by 12,000-11,000 B.P., until some later time in that general period, the lake ceased to exist as a single body of water, having gradually reduced to a series of smaller bodies occupying the deeper depressions in the basin (Bedwell 1973:67: Cressman 1943:13). This occurred over many hundreds of years as temperatures gradually rose and more moderate temperature prevailed. Rainfall may have dropped to sixteen inches a year sometime around the middle of this period. It was during this period with its mild but warmer temperatures and numerous small lakes, marshes, and flowing streams that conditions may have been at an optimum for human hunters and gatherers. During this time period the forests was receding and open areas were increasing over the years. Occupation of the caves were more intense during this time and the butchered remains of waterfowl and many forms of land mammals (including bison) were found in large numbers (Bedwell 1973:67; Connolly 1995; Cressman 1942:144).

Because the temperature curve continued to rise over the centuries, more arid conditions appeared. This was a gradual process, which would be undetectable in any man's lifetime. Lakes and marshes very gradually become shallower and reduced in size, and rainfall lessened. These conditions were becoming more pronounced between 8000-7000 B.P., but true arid conditions did not develop until sometime after 7,000 B.P. (Bedwell 1973; Connolly 1995; Cressman 1943,1977; Willig 1988). If there is an abrupt end or lessening of occupation in the caves at 7,000 B.P., it was more likely due to the effects of the Mount Mazama eruption than any sudden shift in climate. Nonetheless, at some time in the period following the eruption, climatic conditions apparently did worsen and true arid conditions set in. During this time, the average annual temperatures probably rose to a high for the post-glacial period and precipitation was diminished (possibly to less than six inches). With the decrease in rainfall the fauna of the area was also reduced in numbers, although many forms, particularly the smaller ones, were not affected as badly. Ponds and marshes dried up and streams ceased to flow, or became intermittent. It is also quite possible that some springs still existed, but a large number dried up. With the few remaining springs the inhabitants of the area existed outside the lake bed during this warm period (almost all the springs in the basin are found in areas away from the caves). Life would have been possible for hunter gatherers even during this hot period, and some human occupation did continue, but greater mobility was required. At or some time after 5500 B.P. the climate began to improve and the area slowly returned to semi-arid conditions.

In summary of the climatic changes it can be said that the record in the Fort Rock Basin supports Bedwell's and Cressman's position over the reality of an Altithermal period. This is based on the intensity of occupation of the caves, as well as on floral and faunal evidence; there clearly were fluctuations in climate over several millennia, with one period of temperatures definitely indicated as higher than present day readings. The eruption of Mount Mazama certainly had effects on the whole region, (as well as Newberry Crater, but to an lesser extent) but these were limited in duration.

It has been shown that this area underwent environmental shifts potentially of great consequence to the human life-ways within it. From a cool, moist, forest and lake environment, the area gradually changed to lake and grassland. As the temperature curve continued upward the landscape was further modified into marshland and drying lake and, finally, to a dry lake bed and hot blowing pumice sand, punctuated only occasionally in certain places by small springs (e.g. Sand Springs). Then, with the passage of several millennia, these harsh conditions were modified. After a relatively short period of moderately renewed moisture, conditions similar to those of today's semi-desert environment were established.

My survey and analysis of the material collected from the three surface collection sites indicates that there were two lithic strategies being employed on and around Quartz Mountain. The archaeological record at nearby Fort Rock Cave and Cougar Cave show an increased population in this area when the lake would have provided all the floral and faunal needs for a fairly large population for many generations. This shows up in the lithic assemblage as a reliance on blade core technology. However, when the lake is no longer present and conditions require travel of greater distances to acquire food resources, we see in the archeological evidence a shift from blade core reduction to a bifacial reduction core methodology. This methodology shows up at Sand Springs (Scott 1982) and at Mud Springs, 35JE49 (INFOTEC 1995) This suggests that people were traveling great distances to acquire a resource for retooling or for trade items.

An alternative hypotheses is that some of the changes in technology may have come about because of changing hunting strategies as well as in changes of mobility. The changes in the large fauna would mean a reduction in the weight needed to penetrate the hide in order to reach vital organs. These changes would mean a smaller projectile point. A good example of this is when the large mammals such as the mammoth and Bison antiquus became extinct, the Clovis technology changed to a thinner and smaller Western Stemmed projectile point. This type of point style remained until a change in the environment to a warmer and drier regime. When the fauna are forced into different ecosystems (following the water), this caused a different hunting technique and still another shift in weapons. With the production of still smaller projectile points (*i.e.* Desert Side Notched and Desert Corner Notched points). The latter two are made from thick wide flakes from bifacial core reduction. Thus, it is possible that shifts in technology was in response to changes in hunting strategies.

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Appendices

	A	B	C	D	E	F
1	ARTIFACT	PLATFORM	SPLIT FLAKE	HYDRATION	P.LIPPING	PLAT.PREP.
2	BIFACE					
3	BIFACE					
4	BIFACE					
5	BIFACE					
6	BIFACE					
7	BIFACE					
8	BIFACE					
9	DEBRIS					
10	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
11	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
12	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
13	DEBRIS					
14	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
15	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
16	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
17	COREFRAG					
18	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
19	BIFACE					
20	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
21	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
22	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
23	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
24	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
25	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
26	DEBRIS					
27	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
28	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
29	DEBRIS					
30	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
31	DEBRIS					
32	DEBRIS					
33	COMPFLAKE	PLAIN	YES	HEAVY	NO	
34	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
35	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
36	COMPFLAKE	PLAIN	YES	HEAVY	NO	
37	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
38	DEBRIS					
39	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
40	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
41	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
42	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
43	DEBRIS					
44	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
45	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
46	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
47	COMPFLAKE	PLAIN	YES	HEAVY	NO	
48	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND

	A	B	C	D	E	F
49	COMPFLAKE	PLAIN	YES	HEAVY	NO	
50	COMPFLAKE	PLAIN	YES	HEAVY	NO	
51	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
52	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
53	DEBRIS					
54	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
55	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
56	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
57	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
58	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
59	DEBRIS					
60	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
61	DEBRIS					
62	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
63	COMPFLAKE	PLAIN	YES	HEAVY	NO	
64	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
65	COMPFLAKE	PLAIN	YES	MEDIUM	NO	
66	DEBRIS					
67	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
68	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
69	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
70	COMPFLAKE	FACETED	YES	MEDIUM	NO	
71	PROXFLAKE	PLAIN	YES	MEDIUM	NO	GRIND
72	PROXFLAKE	FACETED	YES	MEDIUM	NO	TRIM
73	PROXFLAKE	FACETED	YES	HEAVY	NO	TRIM
74	PROXFLAKE	PLAIN	YES	HEAVY	YES	TRIM
75	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
76	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
77	COMPFLAKE	FACETED	YES	HEAVY	NO	
78	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
79	DEBRIS					
80	DEBRIS					
81	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
82	COMPFLAKE	PLAIN	YES	MEDIUM	NO	
83	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
84	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
85	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
86	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
87	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
88	DEBRIS					
89	COMPFLAKE	FACETED	YES	MEDIUM	NO	
90	DEBRIS					
91	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
92	DEBRIS					
93	DEBRIS					
94	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
95	DEBRIS					
96	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND

	A	B	C	D	E	F
97	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
98	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
99	DEBRIS					
100	DEBRIS					
101	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
102	DEBRIS					
103	DEBRIS					
104	DEBRIS					
105	DEBRIS					
106	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
107	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
108	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
109	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
110	DEBRIS					
111	DEBRIS					
112	DEBRIS					
113	DEBRIS					
114	DEBRIS					
115	COREFRAG					
116	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
117	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
118	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
119	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
120	DEBRIS					
121	DEBRIS					
122	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
123	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
124	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
125	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
126	DEBRIS					
127	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
128	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
129	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
130	DEBRIS					
131	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
132	PROXFLAKE	PLAIN	NO	MEDIUM	NO	TRIM
133	DEBRIS					
134	DEBRIS					
135	DEBRIS					
136	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
137	COMPFLAKE	FACETED	YES	MEDIUM	NO	
138	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
139	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
140	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
141	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
142	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
143	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
144	DEBRIS					

	A	B	C	D	E	F
145	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
146	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
147	COMPFLAKE	PLAIN	YES	HEAVY	NO	
148	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
149	COMPFLAKE	FACETED	YES	MEDIUM	NO	
150	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
151	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
152	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
153	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
154	COMPFLAKE	FACETED	YES	MEDIUM	NO	
155	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
156	DEBRIS					
157	DEBRIS					
158	DEBRIS					
159	DEBRIS					
160	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
161	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
162	DEBRIS					
163	DEBRIS					
164	DEBRIS					
165	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
166	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
167	PROXFLAKE	FACETED	NO	HEAVY	NO	GRIND
168	DEBRIS					
169	DEBRIS					
170	DEBRIS					
171	DEBRIS					
172	DEBRIS					
173	DEBRIS					
174	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
175	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
176	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
177	DEBRIS					
178	COMPFLAKE	FACETED	YES	HEAVY	NO	
179	PROXFLAKE	PLAIN	YES	MEDIUM	YES	TRIM
180	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
181	DEBRIS					
182	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
183	DEBRIS					
184	PROXFLAKE	FACETED	NO	HEAVY	NO	GRIND
185	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
186	DEBRIS					
187	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
188	DEBRIS					
189	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
190	DEBRIS					
191	DEBRIS					
192	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM

	A	B	C	D	E	F
193	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
194	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
195	DEBRIS					
196	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
197	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
198	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
199	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
200	DEBRIS					
201	DEBRIS					
202	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
203	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
204	DEBRIS					
205	DEBRIS					
206	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
207	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
208	DEBRIS					
209	DEBRIS					
210	DEBRIS					
211	CORE					
212	COREFRAG					
213	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
214	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
215	PROXFLAKE	CORTICAL	NO	MEDIUM	NO	TRIM
216	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
217	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
218	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
219	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
220	DEBRIS					
221	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
222	DEBRIS					
223	DEBRIS					
224	COMPFLAKE	PLAIN	YES	HEAVY	NO	
225	DEBRIS					
226	DEBRIS					
227	DEBRIS					
228	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
229	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
230	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
231	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
232	DEBRIS					
233	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
234	DEBRIS					
235	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
236	DEBRIS					
237	COMPFLAKE	FACETED	YES	MEDIUM	NO	
238	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
239	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
240	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND

	A	B	C	D	E	F
241	DEBRIS					
242	DEBRIS					
243	DEBRIS					
244	COREFRAG					
245	COMPFLAKE	FACETED	YES	MEDIUM	NO	
246	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
247	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
248	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
249	PROXFLAKE	CORTICAL	NO	HEAVY	NO	TRIM
250	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
251	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
252	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
253	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
254	COMPFLAKE	FACETED	YES	HEAVY	NO	
255	COMPFLAKE	FACETED	YES	MEDIUM	NO	
256	COMPFLAKE	FACETED	YES	HEAVY	NO	
257	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
258	COMPFLAKE	FACETED	YES	MEDIUM	NO	
259	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
260	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
261	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
262	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
263	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
264	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
265	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
266	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
267	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
268	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
269	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
270	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
271	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
272	DEBRIS					
273	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
274	DEBRIS					
275	DEBRIS					
276	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
277	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
278	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
279	COMPFLAKE	FACETED	YES	HEAVY	NO	
280	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
281	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
282	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
283	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
284	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
285	COREFRAG					
286	CORE					
287	CORE					
288	BIFACE					

	A	B	C	D	E	F
289	CORE					
290	COREFRAG					
291	BIFACE					
292	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
293	CORE					
294	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
295	COREFRAG					
296	COREFRAG					
297	DEBRIS					
298	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
299	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
300	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
301	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
302	DEBRIS					
303	DEBRIS					
304	DEBRIS					
305	DEBRIS					
306	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
307	DEBRIS					
308	DEBRIS					
309	DEBRIS					
310	CORE					
311	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
312	DEBRIS					
313	DEBRIS					
314	COREFRAG					
315	DEBRIS					
316	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
317	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
318	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
319	DEBRIS					
320	DEBRIS					
321	DEBRIS					
322	DEBRIS					
323	DEBRIS					
324	CORE					
325	COREFRAG					
326	COREFRAG					
327	CORE					
328	CORE					
329	COREFRAG					
330	CORE					
331	DEBRIS					
332	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
333	COREFRAG					
334	COREFRAG					
335	DEBRIS					
336	DEBRIS					

	A	B	C	D	E	F
337	DEBRIS					
338	CORE					
339	COMPTOOL					
340	BIFACE					
341	CORE					
342	CORE					
343	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
344	DEBRIS					
345	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
346	DEBRIS					
347	DEBRIS					
348	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
349	DEBRIS					
350	COMPFLAKE	PLAIN	YES	HEAVY	NO	
351	DEBRIS					
352	DEBRIS					
353	DEBRIS					
354	DEBRIS					
355	DEBRIS					
356	DEBRIS					
357	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
358	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
359	COMPFLAKE	PLAIN	YES	HEAVY	NO	
360	DEBRIS					
361	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
362	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
363	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
364	COMPFLAKE	PLAIN	NO	HEAVY	NO	
365	DEBRIS					
366	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
367	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
368	DEBRIS					
369	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
370	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
371	DEBRIS					
372	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
373	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
374	PROXFLAKE	PLAIN	NO	HEAVY	NO	GRIND
375	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
376	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
377	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
378	COMPFLAKE	PLAIN	YES	HEAVY	NO	
379	DEBRIS					
380	DEBRIS					
381	DEBRIS					
382	PROXFLAKE	CORTICAL	NO	HEAVY	NO	TRIM
383	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
384	DEBRIS					

	A	B	C	D	E	F
385	DEBRIS					
386	DEBRIS					
387	DEBRIS					
388	DEBRIS					
389	DEBRIS					
390	DEBRIS					
391	DEBRIS					
392	DEBRIS					
393	DEBRIS					
394	DEBRIS					
395	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
396	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
397	DEBRIS					
398	DEBRIS					
399	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
400	COMPFLAKE	PLAIN	YES	HEAVY	NO	
401	DEBRIS					
402	DEBRIS					
403	DEBRIS					
404	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
405	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
406	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
407	DEBRIS					
408	DEBRIS					
409	PROXFLAKE	PLAIN	NO	HEAVY	NO	GRIND
410	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
411	DEBRIS					
412	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
413	COMPFLAKE	PLAIN	YES	HEAVY	NO	
414	COMPFLAKE	PLAIN	YES	HEAVY	NO	
415	COMPFLAKE	PLAIN	YES	HEAVY	NO	
416	DEBRIS					
417	DEBRIS					
418	DEBRIS					
419	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
420	DEBRIS					
421	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
422	DEBRIS					
423	COREFRAG					
424	CORE					
425	COREFRAG					
426	COREFRAG					
427	CORE					
428	CORE					
429	COREFRAG					
430	CORE					
431	CORE					
432	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM

	A	B	C	D	E	F
433	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
434	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
435	DEBRIS					
436	COMPFLAKE	PLAIN	YES	HEAVY	NO	
437	COMPFLAKE	PLAIN	YES	HEAVY	NO	
438	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
439	DEBRIS					
440	DEBRIS					
441	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
442	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
443	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
444	DEBRIS					
445	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
446	COMPFLAKE	PLAIN	YES	HEAVY	NO	
447	COMPFLAKE	PLAIN	YES	HEAVY	NO	
448	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
449	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
450	DEBRIS					
451	DEBRIS					
452	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
453	DEBRIS					
454	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
455	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
456	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
457	DEBRIS					
458	DEBRIS					
459	DEBRIS					
460	DEBRIS					
461	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
462	DEBRIS					
463	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
464	DEBRIS					
465	DEBRIS					
466	DEBRIS					
467	DEBRIS					
468	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
469	DEBRIS					
470	DEBRIS					
471	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
472	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
473	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
474	DEBRIS					
475	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
476	COMPFLAKE	PLAIN	YES	HEAVY	NO	
477	DEBRIS					
478	DEBRIS					
479	DEBRIS					
480	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM

	A	B	C	D	E	F
481	DEBRIS					
482	DEBRIS					
483	DEBRIS					
484	DEBRIS					
485	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
486	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
487	DEBRIS					
488	DEBRIS					
489	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
490	DEBRIS					
491	DEBRIS					
492	DEBRIS					
493	DEBRIS					
494	DEBRIS					
495	DEBRIS					
496	DEBRIS					
497	DEBRIS					
498	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
499	DEBRIS					
500	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
501	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
502	CORE					
503	CORE					
504	CORE					
505	CORE					
506	CORE					
507	CORE					
508	CORE					
509	COREFRAG					
510	COREFRAG					
511	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
512	DEBRIS					
513	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
514	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
515	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
516	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
517	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
518	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
519	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
520	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
521	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
522	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
523	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
524	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
525	COMPFLAKE	PLAIN	YES	HEAVY	NO	
526	COMPFLAKE	PLAIN	YES	HEAVY	NO	
527	COMPFLAKE	PLAIN	YES	HEAVY	NO	
528	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM

	A	B	C	D	E	F
529	COMPFLAKE	PLAIN	YES	HEAVY	NO	
530	DEBRIS					
531	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
532	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
533						
534						
535	**Artifact**	**Total**	**Average**			
536	**BIFACE**	**11**	**0.021**			
537	**COREFRAG**	**21**	**0.040**			
538	**CORE**	**25**	**0.047**			
539	**PROXFLAKE**	**214**	**0.403**			
540	**COMPFLAKI**	**78**	**0.147**			
541	**COMPTOOL**	**1**	**0.002**			
542	**DEBRIS**	**181**	**0.341**			
543		**531**				
544						

	G	H	I	J	K	L
1	MATERIAL	SURFACE	LEVEL	% CORTEX	COLOR	TERM. TYPE.
2	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
3	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
4	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
5	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
6	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
7	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
8	OBSIDIAN	YES	SURFACE	1	BLACK	
9	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
10	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
11	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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17	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
18	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
19	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
20	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
21	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
22	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
23	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
24	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
25	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
26	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
27	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
28	OBSIDIAN	YES	SURFACE	3	BLACK	
29	OBSIDIAN	YES	SURFACE	3	BLACK	
30	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
31	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
32	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
33	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
34	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
35	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
36	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
37	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
38	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
39	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
40	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
41	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
42	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
43	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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46	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
47	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
48	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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49	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
50	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
51	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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60	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
61	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
62	OBSIDIAN	YES	SURFACE	3	RED/BLACK	NORMAL
63	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
64	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
65	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
66	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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68	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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70	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
71	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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73	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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75	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
76	OBSIDIAN	YES	SURFACE	1	BLACK	
77	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
78	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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81	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
82	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
83	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
84	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
85	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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87	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
88	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
89	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
90	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
91	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
92	OBSIDIAN	YES	SURFACE	2	BLACK	
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94	OBSIDIAN	YES	SURFACE	1	BLACK	
95	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
96	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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98	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
99	OBSIDIAN	YES	SURFACE	1	BLACK	
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115	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
116	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
117	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
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121	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
122	OBSIDIAN	YES	SURFACE	3	BLACK	
123	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
124	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
125	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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128	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
129	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
130	OBSIDIAN	YES	SURFACE	2	BLACK	
131	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
132	OBSIDIAN	YES	SURFACE	2	BLACK	
133	OBSIDIAN	YES	SURFACE	3	BLACK	
134	OBSIDIAN	YES	SURFACE	3	BLACK	
135	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
136	OBSIDIAN	YES	SURFACE	1	BLACK	
137	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
138	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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143	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
144	OBSIDIAN	YES	SURFACE	2	RED/BLACK	

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145	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
146	OBSIDIAN	YES	SURFACE	1	BLACK	
147	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
148	OBSIDIAN	YES	SURFACE	1	BLACK	
149	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
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154	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
155	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
156	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
157	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
158	OBSIDIAN	YES	SURFACE	2	BLACK	
159	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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161	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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172	OBSIDIAN	YES	SURFACE	1	BLACK	
173	OBSIDIAN	YES	SURFACE	1	BLACK	
174	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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176	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
177	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
178	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
179	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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184	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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187	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
188	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
189	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
190	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
191	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
192	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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194	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
195	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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204	OBSIDIAN	YES	SURFACE	1	BLACK	
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211	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
212	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
213	OBSIDIAN	YES	SURFACE	2	RED/BLACK	HINGE
214	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
215	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
216	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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218	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
219	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
220	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
221	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
222	OBSIDIAN	YES	SURFACE	4	RED/BLACK	
223	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
224	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
225	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
226	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
227	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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236	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
237	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
238	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
239	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
240	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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241	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
242	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
243	OBSIDIAN	YES	SURFACE	1	BLACK	
244	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
245	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
246	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
247	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
248	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
249	OBSIDIAN	NO	SURFACE	4	RED/BLACK	
250	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
251	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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253	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
254	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
255	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
256	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
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265	OBSIDIAN	NO	SURFACE	3	RED/BLACK	
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275	OBSIDIAN	YES	SURFACE	2	BLACK	
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278	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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280	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
281	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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284	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
285	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
286	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
287	OBSIDIAN	YES	SURFACE	2	BLACK	
288	OBSIDIAN	YES	SURFACE	1	BLACK	

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290	OBSIDIAN	YES	SURFACE	1	BLACK	
291	OBSIDIAN	YES	SURFACE	1	BLACK	
292	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
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312	OBSIDIAN	YES	SURFACE	4	BLACK	
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314	OBSIDIAN	YES	SURFACE	3	BLACK	
315	OBSIDIAN	YES	SURFACE	2	BLACK	
316	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
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332	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
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334	OBSIDIAN	YES	SURFACE	2	BLACK	
335	OBSIDIAN	YES	SURFACE	1	BLACK	
336	OBSIDIAN	YES	SURFACE	1	BLACK	

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338	OBSIDIAN	YES	SURFACE	1	BLACK	
339	OBSIDIAN	YES	SURFACE	1	BLACK	
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343	OBSIDIAN	YES	SURFACE	1	BLACK	
344	OBSIDIAN	YES	SURFACE	3	BLACK	
345	OBSIDIAN	YES	SURFACE	3	BLACK	NORMAL
346	OBSIDIAN	YES	SURFACE	2	BLACK	
347	OBSIDIAN	YES	SURFACE	3	BLACK	
348	OBSIDIAN	YES	SURFACE	3	BLACK	OVERSHOT
349	OBSIDIAN	YES	SURFACE	3	BLACK	
350	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
351	OBSIDIAN	YES	SURFACE	3	BLACK	
352	OBSIDIAN	YES	SURFACE	2	BLACK	
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356	OBSIDIAN	YES	SURFACE	2	BLACK	
357	OBSIDIAN	YES	SURFACE	1	BLACK	HINGE
358	OBSIDIAN	YES	SURFACE	1	BLACK	
359	OBSIDIAN	YES	SURFACE	1	BLACK	OVERSHOT
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362	OBSIDIAN	YES	SURFACE	2	BLACK	NORMAL
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366	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
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371	OBSIDIAN	YES	SURFACE	1	BLACK	
372	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
373	OBSIDIAN	YES	SURFACE	2	BLACK	
374	OBSIDIAN	YES	SURFACE	3	BLACK	
375	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
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378	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
379	OBSIDIAN	YES	SURFACE	1	BLACK	
380	OBSIDIAN	YES	SURFACE	3	BLACK	
381	OBSIDIAN	YES	SURFACE	3	BLACK	
382	OBSIDIAN	YES	SURFACE	1	BLACK	
383	OBSIDIAN	YES	SURFACE	1	BLACK	
384	OBSIDIAN	YES	SURFACE	2	BLACK	

	G	H	I	J	K	L
385	OBSIDIAN	YES	SURFACE	4	BLACK	
386	OBSIDIAN	YES	SURFACE	2	BLACK	
387	OBSIDIAN	YES	SURFACE	3	BLACK	
388	OBSIDIAN	YES	SURFACE	1	BLACK	
389	OBSIDIAN	YES	SURFACE	2	BLACK	
390	OBSIDIAN	YES	SURFACE	3	BLACK	
391	OBSIDIAN	YES	SURFACE	3	BLACK	
392	OBSIDIAN	YES	SURFACE	5	BLACK	
393	OBSIDIAN	YES	SURFACE	3	BLACK	
394	OBSIDIAN	YES	SURFACE	2	BLACK	
395	OBSIDIAN	YES	SURFACE	2	BLACK	
396	OBSIDIAN	YES	SURFACE	1	BLACK	
397	OBSIDIAN	YES	SURFACE	3	BLACK	
398	OBSIDIAN	YES	SURFACE	1	BLACK	
399	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
400	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
401	OBSIDIAN	YES	SURFACE	2	BLACK	
402	OBSIDIAN	YES	SURFACE	2	BLACK	
403	OBSIDIAN	YES	SURFACE	1	BLACK	
404	OBSIDIAN	YES	SURFACE	3	BLACK	
405	OBSIDIAN	YES	SURFACE	2	BLACK	
406	OBSIDIAN	YES	SURFACE	1	BLACK	
407	OBSIDIAN	YES	SURFACE	3	BLACK	
408	OBSIDIAN	YES	SURFACE	3	BLACK	
409	OBSIDIAN	YES	SURFACE	2	BLACK	
410	OBSIDIAN	YES	SURFACE	1	BLACK	
411	OBSIDIAN	YES	SURFACE	1	BLACK	
412	OBSIDIAN	YES	SURFACE	1	BLACK	
413	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
414	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
415	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
416	OBSIDIAN	YES	SURFACE	1	BLACK	
417	OBSIDIAN	YES	SURFACE	1	BLACK	
418	OBSIDIAN	YES	SURFACE	3	BLACK	
419	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
420	OBSIDIAN	YES	SURFACE	2	BLACK	
421	OBSIDIAN	YES	SURFACE	1	BLACK	
422	OBSIDIAN	YES	SURFACE	1	BLACK	
423	OBSIDIAN	YES	SURFACE	1	BLACK	
424	OBSIDIAN	YES	SURFACE	2	BLACK	
425	OBSIDIAN	YES	SURFACE	2	BLACK	
426	OBSIDIAN	YES	SURFACE	2	BLACK	
427	OBSIDIAN	YES	SURFACE	2	BLACK	
428	OBSIDIAN	YES	SURFACE	2	BLACK	
429	OBSIDIAN	YES	SURFACE	2	BLACK	
430	OBSIDIAN	YES	SURFACE	2	BLACK	
431	OBSIDIAN	YES	SURFACE	3	BLACK	
432	OBSIDIAN	YES	SURFACE	1	BLACK	

	G	H	I	J	K	L
433	OBSIDIAN	YES	SURFACE	1	BLACK	
434	OBSIDIAN	YES	SURFACE	1	BLACK	
435	OBSIDIAN	YES	SURFACE	1	BLACK	
436	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
437	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
438	OBSIDIAN	YES	SURFACE	1	BLACK	
439	OBSIDIAN	YES	SURFACE	1	BLACK	
440	OBSIDIAN	YES	SURFACE	1	BLACK	
441	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
442	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
443	OBSIDIAN	YES	SURFACE	1	BLACK	
444	OBSIDIAN	YES	SURFACE	1	BLACK	
445	OBSIDIAN	YES	SURFACE	1	BLACK	
446	OBSIDIAN	YES	SURFACE	1	BLACK	HINGE
447	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
448	OBSIDIAN	YES	SURFACE	1	BLACK	
449	OBSIDIAN	YES	SURFACE	1	BLACK	
450	OBSIDIAN	YES	SURFACE	1	BLACK	
451	OBSIDIAN	YES	SURFACE	1	BLACK	
452	OBSIDIAN	YES	SURFACE	3	BLACK	OVERSHOT
453	OBSIDIAN	YES	SURFACE	3	BLACK	
454	OBSIDIAN	YES	SURFACE	2	BLACK	
455	OBSIDIAN	YES	SURFACE	1	BLACK	
456	OBSIDIAN	YES	SURFACE	1	BLACK	OVERSHOT
457	OBSIDIAN	YES	SURFACE	2	BLACK	
458	OBSIDIAN	YES	SURFACE	3	BLACK	
459	OBSIDIAN	YES	SURFACE	2	BLACK	
460	OBSIDIAN	YES	SURFACE	2	BLACK	
461	OBSIDIAN	YES	SURFACE	2	BLACK	
462	OBSIDIAN	YES	SURFACE	2	BLACK	
463	OBSIDIAN	YES	SURFACE	1	BLACK	
464	OBSIDIAN	YES	SURFACE	1	BLACK	
465	OBSIDIAN	YES	SURFACE	1	BLACK	
466	OBSIDIAN	YES	SURFACE	2	BLACK	
467	OBSIDIAN	YES	SURFACE	2	BLACK	
468	OBSIDIAN	YES	SURFACE	2	BLACK	
469	OBSIDIAN	YES	SURFACE	2	BLACK	
470	OBSIDIAN	YES	SURFACE	2	BLACK	
471	OBSIDIAN	YES	SURFACE	2	BLACK	
472	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
473	OBSIDIAN	YES	SURFACE	1	BLACK	
474	OBSIDIAN	YES	SURFACE	1	BLACK	
475	OBSIDIAN	YES	SURFACE	4	BLACK	
476	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
477	OBSIDIAN	YES	SURFACE	2	BLACK	
478	OBSIDIAN	YES	SURFACE	2	BLACK	
479	OBSIDIAN	YES	SURFACE	3	BLACK	
480	OBSIDIAN	YES	SURFACE	1	BLACK	

	G	H	I	J	K	L
481	OBSIDIAN	YES	SURFACE	1	BLACK	
482	OBSIDIAN	YES	SURFACE	1	BLACK	
483	OBSIDIAN	YES	SURFACE	1	BLACK	
484	OBSIDIAN	YES	SURFACE	3	BLACK	
485	OBSIDIAN	YES	SURFACE	1	BLACK	
486	OBSIDIAN	YES	SURFACE	1	BLACK	
487	OBSIDIAN	YES	SURFACE	1	BLACK	
488	OBSIDIAN	YES	SURFACE	2	BLACK	
489	OBSIDIAN	YES	SURFACE	2	BLACK	
490	OBSIDIAN	YES	SURFACE	1	BLACK	
491	OBSIDIAN	YES	SURFACE	2	BLACK	
492	OBSIDIAN	YES	SURFACE	1	BLACK	
493	OBSIDIAN	YES	SURFACE	2	BLACK	
494	OBSIDIAN	YES	SURFACE	1	BLACK	
495	OBSIDIAN	YES	SURFACE	1	BLACK	
496	OBSIDIAN	YES	SURFACE	1	BLACK	
497	OBSIDIAN	YES	SURFACE	2	BLACK	
498	OBSIDIAN	YES	SURFACE	1	BLACK	
499	OBSIDIAN	YES	SURFACE	2	BLACK	
500	OBSIDIAN	YES	SURFACE	2	BLACK	OVERSHOT
501	OBSIDIAN	YES	SURFACE	2	BLACK	HINGE
502	OBSIDIAN	YES	SURFACE	2	BLACK	
503	OBSIDIAN	YES	SURFACE	2	BLACK	
504	OBSIDIAN	YES	SURFACE	2	BLACK	
505	OBSIDIAN	YES	SURFACE	1	BLACK	
506	OBSIDIAN	YES	SURFACE	2	BLACK	
507	OBSIDIAN	YES	SURFACE	2	BLACK	
508	OBSIDIAN	YES	SURFACE	3	BLACK	
509	OBSIDIAN	YES	SURFACE	2	BLACK	
510	OBSIDIAN	YES	SURFACE	2	BLACK	
511	OBSIDIAN	YES	SURFACE	1	BLACK	
512	OBSIDIAN	YES	SURFACE	1	BLACK	
513	OBSIDIAN	YES	SURFACE	1	BLACK	
514	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
515	OBSIDIAN	YES	SURFACE	2	BLACK	
516	OBSIDIAN	YES	SURFACE	2	BLACK	NORMAL
517	OBSIDIAN	YES	SURFACE	1	BLACK	
518	OBSIDIAN	YES	SURFACE	1	BLACK	
519	OBSIDIAN	YES	SURFACE	1	BLACK	
520	OBSIDIAN	YES	SURFACE	1	BLACK	
521	OBSIDIAN	YES	SURFACE	1	BLACK	
522	OBSIDIAN	YES	SURFACE	1	BLACK	
523	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
524	OBSIDIAN	YES	SURFACE	1	BLACK	HINGE
525	OBSIDIAN	YES	SURFACE	2	BLACK	OVERSHOT
526	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
527	OBSIDIAN	YES	SURFACE	1	BLACK	HINGE
528	OBSIDIAN	YES	SURFACE	1	BLACK	

	G	H	I	J	K	L
529	OBSIDIAN	YES	SURFACE	1	BLACK	OVERSHOT
530	OBSIDIAN	YES	SURFACE	1	BLACK	
531	OBSIDIAN	YES	SURFACE	1	BLACK	
532	OBSIDIAN	YES	SURFACE	1	BLACK	
533					TOTAL	
534					AVERAGE	
535						
536						
537	COLOR	TOTAL	AVERAGE	% CORTEX	TOTAL	AVERAGE
538	BLACK	285	0.537	O%	367	0.691
539	RED/BLACK	246	0.463	0-10%	97	0.183
540		531		10-40%	60	0.113
541				40-60%	6	0.011
542				60-90%	1	0.002
543				90-100%	0	0.000
544					531	

	M	N	O	P	Q	R
1	BORDIAN	#RET.EDGE	RET.INTENS.	F. LENGTH	F. WIDTH	F. THICKNSS
2	BLADE	2		8.21	5.84	1.28
3	BIFACE	2		11.47	6.79	2.32
4	BIFACE	0		13.51	7.66	3.39
5	BLADE	2		11.89	5.68	1.80
6	BLADE	2		7.68	7.83	2.70
7	BIFACE	2		8.78	5.97	3.07
8	BLADE	2		9.98	6.50	1.46
9		0		3.16	1.16	1.08
10		0		2.25	1.65	0.19
11		0		2.62	2.36	0.38
12		0		1.75	1.74	0.40
13		0		2.62	1.20	0.37
14		0		5.07	2.47	1.37
15		0		1.67	1.77	0.31
16		0		9.71	6.18	1.25
17		0		9.59	7.84	2.69
18		0		6.93	6.07	1.67
19	BIFACE	0		5.60	6.41	3.55
20		0		11.22	3.38	1.62
21		0		7.28	4.26	1.75
22		0		3.93	2.89	0.36
23		0		4.22	3.10	1.04
24		0		3.17	2.20	0.52
25		0		4.30	2.83	0.93
26		0		5.46	3.09	2.35
27		0		2.90	2.22	0.30
28		0		3.67	2.04	1.10
29		0		2.31	1.45	0.71
30		0		3.06	2.59	0.27
31		0		2.23	1.87	0.78
32		0		5.19	1.49	0.52
33		0		3.42	1.67	0.30
34		0		2.72	1.98	0.29
35		0		2.21	1.68	0.18
36		0		3.06	1.71	0.37
37		0		1.92	2.31	0.17
38		0		2.08	1.59	0.73
39		0		2.37	1.89	0.52
40		0		2.24	1.76	0.27
41		0		1.54	1.90	0.63
42		0		3.33	1.33	0.32
43		0		1.74	1.55	0.63
44		0		2.17	1.28	0.19
45		0		2.45	1.04	0.61
46		0		2.68	2.17	0.40
47		0		3.17	2.00	0.24
48		0		1.57	2.57	0.37

	M	N	O	P	Q	R
49		0		2.52	1.60	0.25
50		0		3.01	1.58	0.33
51		0		1.59	1.29	0.23
52		0		2.14	2.09	0.35
53		0		1.97	1.17	0.66
54		0		1.24	1.82	0.43
55		0		1.48	1.36	0.34
56		0		1.26	2.16	0.23
57		0		1.29	0.96	0.30
58		0		2.11	1.50	0.32
59		0		1.32	0.68	0.15
60		0		1.08	1.81	0.21
61		0		6.17	4.52	3.18
62		0		9.33	5.04	1.40
63		0		5.94	7.05	0.74
64		0		5.24	7.63	1.73
65		0		4.65	2.99	0.64
66		0		7.60	5.74	2.12
67		0		8.90	3.73	1.22
68		0		5.76	4.43	1.54
69		0		4.74	4.29	0.60
70		0		4.91	2.75	0.88
71		0		2.62	4.91	0.54
72		0		5.18	2.18	1.19
73		0		4.34	2.99	0.59
74		0		4.09	5.07	1.22
75		0		2.07	3.16	0.57
76		0		4.32	1.35	0.62
77		0		3.99	3.35	0.21
78		0		2.32	2.66	0.46
79		0		4.16	3.31	1.52
80		0		3.16	0.86	0.76
81		0		2.65	3.79	0.79
82		0		3.72	2.49	0.44
83		0		4.27	2.14	1.06
84		0		2.25	2.61	0.28
85		0		3.12	2.43	1.01
86		0		1.32	2.19	0.17
87		0		2.07	2.90	0.22
88		0		2.63	2.73	1.30
89		0		2.42	1.56	0.48
90		0		2.85	1.94	0.93
91		0		1.28	2.78	0.44
92		0		1.62	1.32	0.47
93		0		1.75	1.48	0.60
94		0		1.17	2.13	0.30
95		0		2.08	2.08	0.48
96		0		2.61	1.34	58.00

	M	N	O	P	Q	R
97		0		2.13	0.87	0.53
98		0		1.59	1.10	0.23
99		0		1.68	1.28	0.61
100		0		1.85	1.10	0.58
101		0		1.39	1.61	0.44
102		0		2.49	1.48	0.19
103		0		1.32	0.94	0.07
104		0		2.02	1.90	0.18
105		0		1.84	1.38	0.13
106		0		1.23	1.12	0.15
107		0		1.42	2.22	0.36
108		0		1.60	1.48	0.15
109		0		1.13	1.27	0.29
110		0		1.51	0.84	0.16
111		0		1.67	0.94	0.24
112		0		1.67	0.65	0.21
113		0		1.35	0.65	0.11
114		0		1.09	0.75	0.16
115		0		6.69	5.45	3.17
116		0		8.06	5.40	1.61
117		0		8.67	3.36	1.27
118		0		6.32	5.31	2.69
119		0		6.20	4.78	2.13
120		0		5.73	4.35	2.14
121		0		4.70	3.04	2.46
122		0		2.57	4.47	1.79
123		0		3.69	3.76	0.92
124		0		3.64	2.61	0.95
125		0		3.01	2.96	0.66
126		0		3.05	1.44	0.38
127		0		2.40	2.92	0.96
128		0		2.31	3.01	0.78
129		0		3.01	2.38	0.57
130		0		2.56	2.41	0.43
131		0		2.22	2.57	0.39
132		0		3.27	0.20	1.29
133		0		2.96	2.65	1.88
134		0		3.44	2.08	1.40
135		0		3.02	2.58	0.31
136		0		2.64	1.37	0.69
137		0		3.36	1.52	0.47
138		0		2.87	2.52	0.50
139		0		2.78	0.73	0.33
140		0		2.09	1.88	0.40
141		0		3.09	1.37	0.28
142		0		2.54	2.08	0.52
143		0		1.92	2.42	0.27
144		0		3.64	1.98	1.62

	M	N	O	P	Q	R
145		0		3.00	1.83	0.67
146		0		2.34	1.67	0.25
147		0		2.50	1.45	0.24
148		0		1.65	2.21	0.18
149		0		3.33	1.57	0.45
150		0		2.43	0.98	0.35
151		0		2.48	1.14	0.28
152		0		2.28	2.53	0.37
153		0		3.17	1.46	0.54
154		0		1.54	1.43	0.21
155		0		2.07	1.82	0.55
156		0		4.66	1.92	1.11
157		0		1.72	1.31	0.13
158		0		3.17	1.52	0.98
159		0		2.67	1.11	0.64
160		0		3.74	1.75	0.26
161		0		2.86	1.99	0.29
162		0		2.66	1.52	0.33
163		0		2.43	1.43	0.62
164		0		2.01	1.68	0.27
165		0		3.09	1.94	0.23
166		0		2.09	1.17	0.41
167		0		2.45	1.58	0.25
168		0		2.48	1.95	0.27
169		0		2.85	0.77	0.60
170		0		2.42	0.42	0.27
171		0		2.82	1.18	0.74
172		0		1.60	1.70	0.72
173		0		1.05	0.98	0.75
174		0		2.51	1.42	0.82
175		0		1.71	0.94	0.13
176		0		1.11	1.67	0.13
177		0		1.89	1.19	0.41
178		0		2.46	0.83	0.25
179		0		2.18	1.28	0.41
180		0		2.09	1.61	0.13
181		0		2.21	1.54	0.24
182		0		1.35	2.03	0.21
183		0		2.71	1.68	0.25
184		0		1.91	1.75	0.24
185		0		1.36	1.27	0.18
186		0		2.06	1.15	0.14
187		0		2.04	1.10	0.44
188		0		1.96	1.71	0.36
189		0		2.41	1.56	0.17
190		0		1.73	1.14	0.46
191		0		1.83	1.43	0.77
192		0		2.04	0.92	0.23

	M	N	O	P	Q	R
193		0		1.02	1.60	0.18
194		0		1.26	1.95	0.12
195		0		2.05	0.92	0.39
196		0		1.59	0.92	0.19
197		0		1.47	1.30	0.21
198		0		1.69	1.06	0.34
199		0		1.10	0.79	0.13
200		0		1.78	1.52	0.20
201		0		1.69	1.01	0.11
202		0		1.13	1.70	0.26
203		0		1.05	1.22	0.19
204		0		1.20	0.72	0.07
205		0		1.75	1.30	0.44
206		0		1.01	1.87	0.17
207		0		0.99	1.37	0.26
208		0		2.01	0.98	0.40
209		0		1.46	0.77	0.20
210		0		1.35	0.71	0.09
211		0		14.27	5.87	4.41
212		0		7.31	5.31	3.57
213		0		10.94	5.92	2.73
214		0		4.79	2.97	0.63
215		0		4.08	3.67	0.55
216		0		6.49	2.91	1.74
217		0		4.65	2.90	1.04
218		0		4.86	3.51	0.75
219		0		4.39	2.30	0.67
220		0		4.39	2.19	1.10
221		0		3.25	1.68	0.79
222		0		6.03	3.52	1.88
223		0		7.26	3.57	2.36
224		0		4.48	2.92	1.10
225		0		2.49	1.63	1.23
226		0		44.55	3.46	1.04
227		0		3.16	2.18	1.20
228		0		2.73	2.24	0.50
229		0		1.60	1.85	0.37
230		0		2.21	1.90	0.40
231		0		3.90	1.71	0.41
232		0		3.26	0.82	0.76
233		0		1.94	3.04	0.45
234		0		3.83	2.57	1.09
235		0		2.41	2.02	0.44
236		0		2.76	1.07	0.53
237		0		1.89	1.25	0.39
238		0		1.00	1.20	0.23
239		0		1.85	1.29	0.14
240		0		1.91	1.17	0.23

	M	N	O	P	Q	R
241		0		2.29	1.71	0.90
242		0		1.89	0.88	0.15
243		0		1.28	0.50	0.23
244		0		9.11	6.44	3.15
245		0		6.06	4.68	1.30
246		0		2.99	4.91	1.05
247		0		3.62	4.99	1.35
248		0		5.57	3.41	0.52
249		0		4.68	3.54	1.65
250		0		3.36	3.74	7.10
251		0		3.74	2.71	1.43
252		0		1.80	3.61	0.86
253		0		3.40	3.67	0.98
254		0		4.32	1.74	0.39
255		0		4.32	2.48	0.55
256		0		4.57	1.39	0.76
257		0		1.77	1.63	0.20
258		0		3.29	1.59	0.28
259		0		2.66	3.04	0.49
260		0		3.07	4.16	0.77
261		0		5.66	3.34	1.97
262		0		2.55	2.31	0.65
263		0		3.80	2.97	0.43
264		0		8.86	5.51	2.08
265		0		4.71	3.64	1.14
266		0		5.10	3.70	1.35
267		0		3.78	2.30	0.58
268		0		6.15	3.99	1.66
269		0		3.36	4.41	1.18
270		0		2.91	2.74	0.36
271		0		3.39	1.28	0.50
272		0		3.70	2.26	0.75
273		0		3.95	3.70	1.13
274		0		3.48	2.61	1.43
275		0		3.18	2.48	1.58
276		0		1.79	3.74	1.09
277		0		2.10	2.35	0.75
278		0		3.26	2.74	0.34
279		0		3.33	2.74	0.59
280		0		2.93	1.58	0.88
281		0		2.57	2.33	0.59
282		0		2.33	2.18	0.48
283		0		5.08	3.76	0.48
284		0		10.75	5.79	1.11
285		0		4.41	4.95	2.76
286		0		18.71	6.04	3.94
287		0		11.46	7.78	7.39
288		0		11.07	7.32	2.02

	M	N	O	P	Q	R
289		0		11.07	10.30	3.78
290		0		5.87	8.59	1.95
291		2		10.11	6.49	1.40
292		0		9.39	4.62	1.66
293		0		6.35	5.33	1.50
294		0		3.89	3.79	1.54
295		0		5.98	5.31	2.89
296		0		6.31	6.44	2.76
297		0		5.98	3.95	2.68
298		0		3.98	4.65	2.12
299		0		3.31	3.96	1.50
300		0		5.54	4.41	1.07
301		0		6.66	5.05	1.22
302		0		7.74	3.87	2.49
303		0		6.46	3.99	2.21
304		0		7.35	5.63	2.93
305		0		5.78	4.51	3.20
306		0		3.91	4.88	1.31
307		0		6.12	5.65	3.00
308		0		5.96	4.26	2.53
309		0		7.55	5.36	1.62
310		0		4.99	1.44	0.65
311		0		2.51	4.67	0.79
312		0		7.00	4.52	3.30
313		0		5.88	2.32	2.14
314		0		6.21	4.95	3.54
315		0		3.51	1.79	1.61
316		0		5.30	2.38	1.31
317		0		3.62	3.90	1.08
318		0		4.18	2.15	0.65
319		0		4.40	2.63	1.63
320		0		4.17	2.91	2.40
321		0		6.28	5.76	2.47
322		0		5.72	3.04	1.12
323		0		5.26	3.94	2.64
324		0		8.50	5.65	4.39
325		0		7.29	3.71	3.45
326		0		6.93	4.69	2.83
327		0		13.75	6.56	4.16
328		0		5.98	2.23	2.10
329		0		5.15	4.70	4.02
330		0		6.02	3.03	2.42
331		0		4.75	4.13	1.93
332		0		7.96	6.13	2.04
333		0		6.68	4.04	2.23
334		0		6.34	5.56	3.30
335		0		6.49	5.36	4.10
336		0		6.09	4.06	3.34

	M	N	O	P	Q	R
337		0		6.22	4.19	2.67
338		0		6.38	7.98	4.86
339	knfe	2	NORMAL	14.27	6.78	1.21
340	knife	2		37.20	8.33	4.21
341		0		7.51	4.82	2.79
342		0		8.73	6.93	5.53
343		0		6.81	10.38	3.55
344		0		7.89	6.12	2.55
345		0		9.55	5.50	2.09
346		0		6.06	8.31	0.00
347		0		6.14	8.32	4.62
348		0		9.82	4.68	3.45
349		0		10.22	5.20	2.60
350		0		6.40	7.35	4.31
351		0		7.25	6.58	4.32
352		0		9.81	8.48	3.51
353		0		6.94	5.32	3.59
354		0		6.83	6.26	3.94
355		0		6.72	5.37	3.72
356		0		9.02	5.49	5.00
357		0		3.78	2.67	0.50
358		0		4.95	3.92	0.29
359		0		2.01	3.72	0.57
360		0		4.90	3.57	2.47
361		0		5.97	2.40	1.83
362		0		5.41	2.07	1.51
363		0		3.52	5.30	1.27
364		0		6.25	1.74	1.17
365		0		6.51	3.57	2.50
366		0		6.95	1.27	0.67
367		0		3.35	1.90	0.61
368		0		2.22	2.09	1.56
369		0		3.67	3.08	1.11
370		0		2.51	4.00	0.95
371		0		3.05	3.35	2.73
372		0		6.79	3.54	1.27
373		0		4.23	5.15	1.58
374		0		3.39	2.11	0.85
375		0		3.63	1.59	0.54
376		0		2.39	2.68	0.32
377		0		2.83	0.98	0.73
378		0		1.98	2.04	0.29
379		0		5.61	3.78	3.11
380		0		4.68	3.24	2.53
381		0		5.30	4.18	2.89
382		0		3.57	3.24	2.33
383		0		2.71	1.77	0.57
384		0		5.18	3.65	2.35

	M	N	O	P	Q	R
385		0		3.53	2.16	1.20
386		0		5.11	4.04	2.23
387		0		3.76	2.53	2.13
388		0		3.82	3.04	1.78
389		0		4.22	2.54	1.70
390		0		3.41	2.72	2.34
391		0		4.86	2.43	1.88
392		0		4.15	3.09	1.26
393		0		3.86	3.18	1.80
394		0		4.40	3.05	2.16
395		0		3.88	3.36	1.22
396		0		3.07	3.39	1.41
397		0		2.89	2.38	0.76
398		0		3.12	2.32	1.60
399		0		3.07	0.78	0.33
400		0		2.86	1.31	0.22
401		0		2.00	1.85	0.87
402		0		2.20	2.15	1.78
403		0		3.77	1.26	0.56
404		0		2.05	5.03	0.59
405		0		2.68	1.17	1.09
406		0		1.82	3.46	0.37
407		0		3.78	1.62	1.00
408		0		3.77	1.70	1.01
409		0		1.99	3.12	0.79
410		0		1.87	2.76	0.46
411		0		3.53	2.03	0.61
412		0		2.10	0.78	0.55
413		0		2.94	1.50	0.27
414		0		1.72	1.68	0.26
415		0		2.29	2.38	0.22
416		0		2.60	0.94	0.68
417		0		3.15	2.41	1.98
418		0		2.46	1.61	0.92
419		0		2.95	1.16	0.55
420		0		1.80	1.66	0.83
421		0		1.65	1.38	0.27
422		0		1.93	1.57	0.36
423		0		12.71	8.07	4.65
424		0		6.90	9.57	5.61
425		0		17.66	8.38	4.53
426		0		7.69	4.09	3.63
427		0		3.95	6.59	4.02
428		0		8.17	5.60	3.39
429		0		13.19	9.90	6.08
430		0		10.90	6.22	2.22
431		0		10.00	10.92	7.94
432		0		1.40	1.16	0.59

	M	N	O	P	Q	R
433		0		1.46	1.38	0.29
434		0		2.44	1.90	0.59
435		0		2.26	1.64	0.22
436		0		2.00	1.01	0.31
437		0		2.26	1.32	0.48
438		0		1.42	1.40	0.13
439		0		1.99	1.41	1.00
440		0		2.14	1.19	0.56
441		0		5.38	2.78	1.18
442		0		6.02	2.23	0.77
443		0		1.17	1.21	0.14
444		0		1.47	0.89	0.46
445		0		1.36	1.44	0.27
446		0		1.42	1.08	0.14
447		0		1.21	0.69	20.00
448		0		0.76	1.40	0.27
449		0		1.28	1.13	0.19
450		0		2.14	1.81	0.64
451		0		2.16	1.54	0.91
452		0		9.73	4.57	3.77
453		0		5.57	3.84	3.51
454		0		5.68	2.03	1.19
455		0		4.59	3.84	1.67
456		0		3.57	0.98	0.46
457		0		8.04	4.34	3.78
458		0		4.27	2.36	2.43
459		0		5.61	4.27	3.01
460		0		6.24	5.45	2.51
461		0		5.38	4.57	1.80
462		0		5.73	5.20	2.97
463		0		3.44	2.62	0.68
464		0		3.18	2.08	1.41
465		0		6.53	5.06	2.24
466		0		4.66	3.25	1.39
467		0		4.11	3.21	1.65
468		0		3.61	1.80	1.01
469		0		4.53	3.12	2.21
470		0		4.50	3.38	2.63
471		0		4.18	3.20	0.88
472		0		2.87	1.65	0.47
473		0		3.20	1.37	0.58
474		0		3.19	2.79	1.20
475		0		2.57	1.78	0.28
476		0		4.14	2.50	0.50
477		0		3.78	2.23	1.35
478		0		4.73	2.04	1.36
479		0		3.26	3.01	1.57
480		0		4.79	3.55	1.32

	M	N	O	P	Q	R
481		0		4.53	2.09	1.11
482		0		4.48	2.69	1.17
483		0		3.63	2.21	1.13
484		0		2.93	2.05	1.22
485		0		2.21	1.46	0.99
486		0		3.15	1.86	0.97
487		0		3.02	1.52	0.49
488		0		2.55	1.66	1.49
489		0		3.50	1.98	1.80
490		0		2.82	1.39	1.06
491		0		2.27	1.39	0.60
492		0		2.22	1.57	0.30
493		0		2.48	2.11	1.18
494		0		1.93	1.66	0.32
495		0		2.19	1.62	0.66
496		0		1.82	1.26	0.75
497		0		2.34	1.55	1.01
498		0		1.59	0.92	0.42
499		0		2.15	1.42	0.61
500		0		10.29	8.92	2.11
501		0		8.41	6.63	2.06
502		0		11.17	10.78	5.60
503		0		11.17	5.56	4.38
504		0		8.36	6.27	4.48
505		0		7.49	5.77	3.51
506		0		12.76	7.21	4.05
507		0		10.08	7.80	5.25
508		0		10.17	6.17	5.32
509		0		11.12	5.36	5.39
510		0		5.20	5.79	5.57
511		0		6.01	4.85	1.74
512		0		7.37	3.88	1.83
513		0		5.12	3.50	1.38
514		0		6.03	3.08	1.24
515		0		3.23	3.13	0.68
516		0		4.61	2.36	0.34
517		0		4.17	2.43	0.75
518		0		2.88	3.51	0.54
519		0		2.57	2.56	0.47
520		0		4.06	2.41	0.31
521		0		1.71	2.01	0.31
522		0		2.34	1.46	0.19
523		0		6.40	4.09	0.82
524		0		5.70	5.63	0.64
525		0		7.74	8.26	1.77
526		0		7.22	4.49	1.35
527		0		7.98	5.55	1.27
528		0		4.81	2.39	0.48

	M	N	O	P	Q	R
529		0		7.92	5.03	0.54
530		0		4.94	4.01	1.26
531		0		5.28	4.01	1.52
532		0		5.04	3.10	0.63
533		**18.00**		**2301.59**	**1607.88**	**762.01**
534		**0.03**		**4.33**	**3.03**	**1.44**
535						
536						
537						
538						
539						
540						
541						
542						
543						
544						

	S	T	U
1	**PLAT.THICK.**	**PLAT.WIDTH**	**FRAGMENT**
2	1.25	2.70	0
3	0.00	0.00	0
4	0.00	0.00	0
5	0.00	0.00	0
6	1.29	3.58	0
7	0.00	0.00	0
8	0.65	1.26	0
9	0.00	0.00	3
10	0.15	0.33	3
11	0.19	0.66	3
12	0.34	0.72	2
13	0.00	0.00	3
14	0.14	0.70	4
15	0.30	0.96	2
16	0.36	1.04	6
17	1.70	3.32	0
18	0.89	2.57	5
19	0.00	0.00	0
20	1.12	2.84	0
21	0.94	2.77	0
22	0.14	0.78	3
23	0.70	1.62	4
24	0.41	2.18	3
25	0.33	1.24	4
26	0.00	0.00	4
27	0.25	1.48	3
28	1.10	1.76	3
29	0.00	0.00	3
30	0.16	1.12	4
31	0.00	0.00	3
32	0.00	0.00	4
33	0.17	0.28	0
34	0.40	0.61	3
35	0.02	0.51	3
36	0.18	1.51	0
37	0.16	1.58	3
38	0.00	0.00	3
39	0.52	1.76	3
40	0.14	0.73	3
41	0.14	0.38	2
42	0.10	0.08	3
43	0.00	0.00	2
44	0.04	0.15	3
45	0.18	0.55	3
46	0.23	1.24	3
47	0.14	1.73	0
48	0.21	1.13	2

	S	T	U
49	0.21	0.71	0
50	0.06	0.75	0
51	0.06	0.21	2
52	0.18	1.98	3
53	0.00	0.00	2
54	0.32	0.86	2
55	0.34	1.38	2
56	0.23	0.78	2
57	0.29	0.92	2
58	0.09	0.21	3
59	0.00	0.00	2
60	0.21	0.56	2
61	0.00	0.00	5
62	0.88	3.16	0
63	0.66	1.67	0
64	0.87	4.41	4
65	0.13	1.01	0
66	0.00	0.00	5
67	0.88	3.02	0
68	0.59	2.41	4
69	0.45	2.98	4
70	0.18	0.46	0
71	0.54	2.12	3
72	0.19	0.33	4
73	0.14	0.93	4
74	0.19	3.33	4
75	0.54	1.40	3
76	0.18	0.35	4
77	0.26	1.43	0
78	0.25	1.38	3
79	0.00	0.00	4
80	0.00	0.00	3
81	0.41	1.73	3
82	0.20	1.79	0
83	0.79	1.30	4
84	0.28	2.66	3
85	0.29	0.60	3
86	0.16	0.49	2
87	0.17	1.05	3
88	0.00	0.00	3
89	0.13	0.56	0
90	0.00	0.00	3
91	0.28	0.85	2
92	0.00	0.00	2
93	0.00	0.00	2
94	0.21	0.83	2
95	0.00	0.00	3
96	0.58	0.77	3

	S	T	U
97	0.33	0.47	3
98	0.20	0.95	2
99	0.00	0.00	2
100	0.00	0.00	2
101	0.25	1.13	2
102	0.00	0.00	3
103	0.00	0.00	2
104	0.00	0.00	3
105	0.00	0.00	2
106	0.11	0.28	2
107	0.36	1.54	2
108	0.09	0.35	2
109	0.29	0.61	2
110	0.00	0.00	2
111	0.00	0.00	2
112	0.00	0.00	2
113	0.00	0.00	2
114	0.00	0.00	2
115	4.65	2.70	0
116	1.27	4.85	0
117	0.47	1.69	0
118	0.91	3.66	5
119	0.91	3.91	5
120	0.00	0.00	4
121	0.00	0.00	4
122	0.17	1.70	3
123	0.88	1.61	0
124	0.62	2.03	3
125	0.29	0.69	3
126	0.00	0.00	3
127	0.96	2.93	3
128	0.79	3.02	3
129	0.36	1.48	3
130	0.00	0.00	3
131	0.29	2.14	3
132	0.11	0.45	3
133	0.00	0.00	3
134	0.00	0.00	3
135	0.00	0.00	3
136	0.19	0.29	3
137	0.15	1.23	0
138	0.21	0.57	3
139	0.29	0.36	3
140	0.05	0.40	3
141	0.16	0.40	3
142	0.31	0.62	3
143	0.23	1.10	3
144	0.00	0.00	3

	S	T	U
145	0.29	0.64	3
146	0.05	0.39	3
147	0.14	1.25	0
148	0.13	0.41	2
149	0.15	0.54	0
150	0.22	0.41	3
151	0.18	0.60	3
152	0.22	0.63	3
153	0.03	0.42	3
154	0.10	0.37	0
155	0.27	0.67	3
156	0.00	0.00	4
157	0.00	0.00	2
158	0.00	0.00	3
159	0.00	0.00	3
160	0.27	1.29	3
161	0.07	0.48	3
162	0.00	0.00	3
163	0.00	0.00	3
164	0.00	0.00	2
165	0.18	1.15	3
166	0.33	0.56	3
167	0.03	0.69	3
168	0.00	0.00	3
169	0.00	0.00	3
170	0.00	0.00	3
171	0.00	0.00	3
172	0.00	0.00	2
173	0.00	0.00	2
174	0.08	0.33	3
175	0.09	0.20	2
176	0.14	0.55	2
177	0.00	0.00	2
178	0.23	0.70	0
179	0.17	1.25	3
180	0.10	0.47	3
181	0.00	0.00	3
182	0.08	0.38	2
183	0.00	0.00	3
184	0.16	0.34	2
185	0.17	0.54	2
186	0.00	0.00	3
187	0.11	0.63	3
188	0.00	0.00	2
189	0.05	0.59	3
190	0.00	0.00	2
191	0.00	0.00	2
192	0.08	0.20	2

	S	T	U
193	0.07	0.56	2
194	0.08	0.71	2
195	0.00	0.00	3
196	0.05	0.35	2
197	0.12	1.31	2
198	0.29	1.01	2
199	0.11	0.49	2
200	0.00	0.00	2
201	0.00	0.00	2
202	0.21	0.50	2
203	0.14	0.88	1
204	0.00	0.00	2
205	0.00	0.00	2
206	0.18	0.79	2
207	0.09	0.33	1
208	0.00	0.00	2
209	0.00	0.00	2
210	0.00	0.00	2
211	3.40	3.26	0
212	2.96	4.46	0
213	0.84	1.88	0
214	0.63	2.30	0
215	0.48	2.58	4
216	0.21	2.22	5
217	0.32	1.15	4
218	0.71	2.67	4
219	0.35	0.77	0
220	0.00	0.00	4
221	0.62	1.52	0
222	0.00	0.00	5
223	0.00	0.00	5
224	0.49	1.35	0
225	0.00	0.00	3
226	0.00	0.00	4
227	0.00	0.00	3
228	0.25	1.10	3
229	0.24	1.29	2
230	0.35	1.71	3
231	0.09	0.26	3
232	0.00	0.00	3
233	0.25	2.55	2
234	0.00	0.00	3
235	0.37	0.94	3
236	0.00	0.00	3
237	0.28	0.62	0
238	0.13	0.61	2
239	0.06	0.97	2
240	0.17	1.17	2

	S	T	U
241	0.00	0.00	3
242	0.00	0.00	2
243	0.00	0.00	2
244	2.03	2.21	0
245	0.38	2.04	0
246	0.45	3.53	3
247	0.30	3.58	3
248	0.46	1.49	0
249	0.89	1.87	4
250	0.22	1.40	0
251	0.56	1.45	3
252	0.20	0.67	2
253	0.85	1.88	3
254	0.38	1.24	0
255	0.51	1.37	0
256	0.30	0.71	0
257	0.21	1.28	3
258	0.21	0.84	0
259	0.35	1.13	5
260	0.66	2.64	3
261	1.67	3.38	4
262	0.45	1.36	3
263	0.21	1.41	3
264	0.54	2.11	6
265	0.92	2.71	4
266	0.45	1.19	4
267	0.22	2.09	3
268	1.54	3.56	5
269	1.18	2.98	3
270	0.30	1.53	3
271	0.24	1.10	4
272	0.00	0.00	3
273	0.62	1.51	4
274	0.00	0.00	3
275	0.00	0.00	3
276	0.38	1.24	2
277	0.75	1.03	2
278	0.26	1.24	3
279	0.40	1.47	0
280	0.15	0.29	0
281	0.45	1.22	3
282	0.17	0.75	3
283	0.15	1.61	4
284	0.28	1.10	0
285	2.20	3.26	0
286	1.06	2.02	0
287	7.36	6.89	0
288	0.85	2.43	0

	S	T	U
289	1.84	10.23	0
290	0.78	7.06	0
291	0.73	1.30	0
292	1.30	3.17	0
293	1.22	4.73	0
294	1.48	3.76	4
295	2.62	4.20	0
296	0.82	6.03	0
297	0.00	0.00	4
298	2.20	4.13	4
299	1.46	3.89	3
300	0.59	1.86	4
301	1.21	0.61	5
302	0.00	0.00	5
303	0.00	0.00	5
304	0.00	0.00	5
305	0.00	0.00	4
306	0.32	0.86	3
307	0.00	0.00	4
308	0.00	0.00	4
309	0.00	0.00	5
310	0.31	0.63	0
311	0.34	1.72	3
312	0.00	0.00	5
313	0.00	0.00	4
314	0.00	0.00	0
315	0.00	0.00	3
316	0.51	0.45	0
317	0.23	1.16	4
318	0.44	1.86	4
319	0.00	0.00	4
320	0.00	0.00	4
321	0.00	0.00	5
322	0.00	0.00	4
323	0.00	0.00	4
324	5.16	5.65	0
325	3.05	3.29	0
326	3.07	3.89	0
327	1.71	5.69	0
328	1.36	1.68	0
329	0.85	2.14	0
330	2.73	2.68	0
331	0.00	0.00	4
332	2.13	3.36	0
333	1.93	2.53	0
334	2.68	5.80	0
335	0.00	0.00	5
336	0.00	0.00	5

	S	T	U
337	0.00	0.00	5
338	3.34	5.04	0
339	1.07	2.83	0
340	0.00	0.00	0
341	2.76	3.68	0
342	3.32	5.45	0
343	0.33	2.73	5
344	0.00	0.00	5
345	1.96	4.78	0
346	0.00	0.00	5
347	0.00	0.00	5
348	0.76	3.42	0
349	0.00	0.00	5
350	1.08	3.02	0
351	0.00	0.00	5
352	0.00	0.00	6
353	0.00	0.00	5
354	0.00	0.00	5
355	0.00	0.00	5
356	0.00	0.00	5
357	0.33	0.61	0
358	0.20	3.69	4
359	0.26	0.72	0
360	0.00	0.00	4
361	0.26	0.99	4
362	0.48	1.63	0
363	0.40	2.10	3
364	0.34	1.03	0
365	0.00	0.00	4
366	0.52	0.62	0
367	0.58	1.55	3
368	0.00	0.00	3
369	1.11	3.13	4
370	0.95	1.97	3
371	0.00	0.00	3
372	0.98	2.72	0
373	0.13	1.37	4
374	0.16	0.58	3
375	0.21	0.68	0
376	0.27	1.20	3
377	0.45	0.68	3
378	0.22	1.31	0
379	0.00	0.00	4
380	0.00	0.00	3
381	0.00	0.00	4
382	0.16	1.78	3
383	0.15	0.73	3
384	0.00	0.00	4

	S	T	U
385	0.00	0.00	3
386	0.00	0.00	3
387	0.00	0.00	3
388	0.00	0.00	3
389	0.00	0.00	4
390	0.00	0.00	3
391	0.00	0.00	4
392	0.00	0.00	4
393	0.00	0.00	3
394	0.00	0.00	4
395	0.58	2.55	3
396	0.26	0.27	3
397	0.00	0.00	3
398	0.00	0.00	3
399	0.38	0.62	0
400	0.24	0.85	0
401	0.00	0.00	2
402	0.00	0.00	3
403	0.00	0.00	3
404	0.23	0.53	3
405	1.24	1.09	3
406	0.15	0.87	2
407	0.00	0.00	3
408	0.00	0.00	3
409	0.60	2.07	3
410	0.38	2.71	2
411	0.00	0.00	3
412	0.21	0.38	3
413	0.15	0.66	0
414	0.16	0.55	0
415	0.13	1.08	0
416	0.00	0.00	3
417	0.00	0.00	3
418	0.00	0.00	3
419	0.40	0.95	0
420	0.00	0.00	2
421	0.22	0.50	2
422	0.00	0.00	2
423	2.05	2.21	0
424	4.54	6.82	0
425	2.85	7.32	0
426	1.62	2.98	0
427	3.60	6.37	0
428	2.73	5.06	0
429	5.24	9.88	0
430	2.02	5.05	0
431	6.70	7.40	0
432	0.42	0.71	2

	S	T	U
433	0.43	0.90	2
434	0.30	0.69	3
435	0.00	0.00	3
436	0.32	1.00	0
437	0.45	0.68	0
438	0.13	0.67	2
439	0.00	0.00	2
440	0.00	0.00	3
441	1.23	1.19	0
442	0.14	0.59	0
443	0.20	0.81	2
444	0.00	0.00	2
445	0.19	1.28	2
446	0.02	0.21	0
447	0.14	0.36	0
448	0.06	0.32	2
449	0.18	0.27	2
450	0.00	0.00	3
451	0.00	0.00	3
452	2.19	2.22	0
453	0.00	0.00	4
454	0.96	1.88	4
455	0.30	0.52	4
456	0.22	0.43	0
457	0.00	0.00	5
458	0.00	0.00	4
459	0.00	0.00	4
460	0.00	0.00	4
461	1.17	3.43	4
462	0.00	0.00	4
463	0.37	1.36	3
464	0.00	0.00	3
465	0.00	0.00	5
466	0.00	0.00	4
467	0.00	0.00	3
468	0.18	0.71	2
469	0.00	0.00	4
470	0.00	0.00	4
471	0.09	0.76	4
472	1.03	0.43	3
473	0.40	0.62	3
474	0.00	0.00	3
475	0.25	1.61	3
476	0.30	0.56	0
477	0.00	0.00	3
478	0.00	0.00	4
479	0.00	0.00	3
480	1.33	3.36	3

	S	T	U
481	0.00	0.00	4
482	0.00	0.00	4
483	0.00	0.00	3
484	0.00	0.00	3
485	1.02	1.20	3
486	0.80	1.16	3
487	0.00	0.00	3
488	0.00	0.00	3
489	0.19	0.58	3
490	0.00	0.00	3
491	0.00	0.00	3
492	0.00	0.00	3
493	0.00	0.00	3
494	0.00	0.00	2
495	0.00	0.00	3
496	0.00	0.00	2
497	0.00	0.00	3
498	0.14	0.27	2
499	0.00	0.00	3
500	1.95	4.87	0
501	1.62	4.42	0
502	5.20	7.28	0
503	3.58	4.95	0
504	2.25	6.11	0
505	2.03	4.39	0
506	2.72	3.79	0
507	4.03	5.44	0
508	2.61	6.42	0
509	1.10	2.09	0
510	5.77	5.74	0
511	2.09	4.10	4
512	0.00	0.00	5
513	2.63	0.68	4
514	0.53	1.74	0
515	0.73	1.39	3
516	0.39	1.12	0
517	0.26	1.29	4
518	0.35	0.77	3
519	0.17	0.44	3
520	0.12	0.70	4
521	0.80	0.82	2
522	0.09	0.27	3
523	0.38	1.03	0
524	0.52	0.82	0
525	0.61	2.95	0
526	1.23	3.58	0
527	0.31	1.35	0
528	0.50	1.36	4

	S	T	U
529	0.53	2.53	0
530	0.00	0.00	4
531	0.35	1.40	4
532	0.38	1.61	4
533	**257.29**	**617.60**	**1247.00**
534	**0.48**	**1.16**	**2.35**
535			
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	A	B	C	D	E	F
1	**ARTIFACT**	**PLATFORM**	**SPLIT FLAKE**	**HYDRATION**	**P.LIPPING**	**PLAT.PREP.**
2	BIFACE					
3	BIFACE					
4	BIFACE					
5	BIFACE					
6	BIFACE					
7	BIFACE					
8	BIFACE					
9	BIFACE					
10	COMPFLAKE	FACETED	YES	HEAVY	NO	
11	COMPFLAKE	FACETED	YES	HEAVY	NO	
12	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
13	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
14	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
15	COMPFLAKE	PLAIN	YES	HEAVY	NO	
16	COMPFLAKE	PLAIN	YES	HEAVY	NO	
17	COMPFLAKE	PLAIN	YES	HEAVY	NO	
18	COMPFLAKE	PLAIN	YES	HEAVY	NO	
19	COMPFLAKE	PLAIN	YES	HEAVY	NO	
20	COMPFLAKE	PLAIN	YES	HEAVY	NO	
21	COMPFLAKE	PLAIN	YES	MEDIUM	NO	
22	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
23	COMPFLAKE	FACETED	YES	MEDIUM	NO	
24	COMPFLAKE	PLAIN	YES	MEDIUM	NO	
25	COMPFLAKE	FACETED	YES	MEDIUM	NO	
26	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
27	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
28	COMPFLAKE	FACETED	YES	MEDIUM	NO	
29	COMPFLAKE	PLAIN	YES	HEAVY	NO	
30	COMPFLAKE	FACETED	YES	MEDIUM	NO	
31	COMPFLAKE	FACETED	YES	MEDIUM	NO	
32	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
33	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
34	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
35	COMPFLAKE	PLAIN	YES	HEAVY	NO	
36	COMPFLAKE	FACETED	YES	MEDIUM	NO	
37	COMPFLAKE	FACETED	YES	MEDIUM	NO	
38	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
39	COMPFLAKE	FACETED	YES	HEAVY	NO	
40	COMPFLAKE	FACETED	YES	MEDIUM	NO	
41	COMPFLAKE	FACETED	YES	HEAVY	NO	
42	COMPFLAKE	FACETED	YES	MEDIUM	NO	
43	COMPFLAKE	FACETED	YES	HEAVY	NO	
44	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
45	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
46	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
47	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
48	CORE					

	A	B	C	D	E	F
49	COREFRAG					
50	COREFRAG					
51	COREFRAG					
52	COREFRAG					
53	DEBRIS					
54	DEBRIS					
55	DEBRIS					
56	DEBRIS					
57	DEBRIS					
58	DEBRIS					
59	DEBRIS					
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61	DEBRIS					
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93	DEBRIS					
94	DEBRIS					
95	DEBRIS					
96	DEBRIS					

	A	B	C	D	E	F
97	DEBRIS					
98	DEBRIS					
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101	DEBRIS					
102	DEBRIS					
103	DEBRIS					
104	DEBRIS					
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127	DEBRIS					
128	DEBRIS					
129	DEBRIS					
130	DEBRIS					
131	DEBRIS					
132	DEBRIS					
133	DEBRIS					
134	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
135	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
136	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
137	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
138	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
139	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
140	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
141	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
142	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
143	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
144	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM

	A	B	C	D	E	F
145	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
146	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
147	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
148	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
149	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
150	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
151	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
152	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
153	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
154	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
155	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
156	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
157	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
158	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
159	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
160	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
161	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
162	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
163	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
164	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
165	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
166	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
167	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
168	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
169	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
170	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
171	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
172	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
173	PROXFLAKE	PLAIN	YES	HEAVY	NO	GRIND
174	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
175	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
176	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
177	PROXFLAKE	PLAIN	YES	MEDIUM	NO	GRIND
178	PROXFLAKE	FACETED	YES	MEDIUM	NO	TRIM
179	PROXFLAKE	FACETED	YES	HEAVY	NO	TRIM
180	PROXFLAKE	PLAIN	YES	HEAVY	YES	TRIM
181	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
182	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
183	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
184	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
185	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
186	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
187	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
188	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
189	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
190	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
191	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
192	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM

	A	B	C	D	E	F
193	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
194	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
195	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
196	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
197	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
198	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
199	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
200	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
201	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
202	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
203	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
204	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
205	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
206	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
207	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
208	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
209	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
210	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
211	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
212	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
213	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
214	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
215	PROXFLAKE	FACETED	NO	HEAVY	NO	GRIND
216	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
217	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
218	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
219	PROXFLAKE	PLAIN	YES	MEDIUM	YES	TRIM
220	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
221	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
222	PROXFLAKE	FACETED	NO	HEAVY	NO	GRIND
223	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
224	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
225	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
226	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
227	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
228	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
229	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
230	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
231	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
232	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
233	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
234	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
235	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
236	PROXFLAKE	CORTICAL	NO	MEDIUM	NO	TRIM
237	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
238	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
239	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
240	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND

	A	B	C	D	E	F
241	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
242	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
243	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
244	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
245	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
246	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
247	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
248	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
249	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
250	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
251	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
252	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
253	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
254	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
255	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
256	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
257	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
258	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
259	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
260	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
261	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
262	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
263	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
264	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
265	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
266	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
267	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
268	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
269	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
270	PROXFLAKE	PLAIN	NO	MEDIUM	NO	TRIM
271	PROXFLAKE	CORTICAL	YES	HEAVY	NO	GRIND
272	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
273	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
274	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
275	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
276	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
277	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
278	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
279	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
280	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
281	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
282	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
283	PROXFLAKE	CORTICAL	NO	HEAVY	NO	TRIM
284						
285						
286	**Artifact**	**Total**	**Average**			
287	**BIFACE**	9	0.032			
288	**COREFRAG**	4	0.014			

	A	B	C	D	E	F
289	CORE	1	0.004			
290	PROXFLAKE	150	0.530			
291	COMPFLAKE	38	0.134			
292	COMPTOOL	0	0.000			
293	DEBRIS	81	0.286			
294		283				

	G	H	I	J	K	L
1	MATERIAL	SURFACE	LEVEL	% CORTEX	COLOR	TERM. TYPE.
2	OBSIDIAN	YES	SURFACE	1	BLACK	
3	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
4	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
5	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
6	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
7	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
8	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
9	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
10	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
11	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
12	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
13	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
14	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
15	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
16	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
17	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
18	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
19	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
20	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
21	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
22	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
23	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
24	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
25	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
26	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
27	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
28	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
29	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
30	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
31	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
32	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
33	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
34	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
35	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
36	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
37	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
38	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
39	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
40	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
41	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
42	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
43	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
44	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
45	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
46	OBSIDIAN	YES	SURFACE	2	RED/BLACK	HINGE
47	OBSIDIAN	YES	SURFACE	3	RED/BLACK	NORMAL
48	OBSIDIAN	YES	SURFACE	2	RED/BLACK	

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49	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
50	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
51	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
52	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
53	OBSIDIAN	YES	SURFACE	1	BLACK	
54	OBSIDIAN	YES	SURFACE	1	BLACK	
55	OBSIDIAN	YES	SURFACE	1	BLACK	
56	OBSIDIAN	YES	SURFACE	1	BLACK	
57	OBSIDIAN	YES	SURFACE	1	BLACK	
58	OBSIDIAN	YES	SURFACE	1	BLACK	
59	OBSIDIAN	YES	SURFACE	1	BLACK	
60	OBSIDIAN	YES	SURFACE	1	BLACK	
61	OBSIDIAN	YES	SURFACE	1	BLACK	
62	OBSIDIAN	YES	SURFACE	1	BLACK	
63	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
64	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
65	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
66	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
67	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
68	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
69	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
70	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
71	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
72	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
73	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
74	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
75	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
76	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
77	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
78	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
79	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
80	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
81	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
82	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
83	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
84	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
85	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
86	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
87	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
88	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
89	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
90	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
91	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
92	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
93	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
94	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
95	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
96	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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97	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
98	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
99	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
100	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
101	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
102	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
103	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
104	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
105	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
106	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
107	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
108	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
109	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
110	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
111	OBSIDIAN	YES	SURFACE	2	BLACK	
112	OBSIDIAN	YES	SURFACE	2	BLACK	
113	OBSIDIAN	YES	SURFACE	2	BLACK	
114	OBSIDIAN	YES	SURFACE	2	BLACK	
115	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
116	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
117	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
118	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
119	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
120	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
121	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
122	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
123	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
124	OBSIDIAN	YES	SURFACE	3	BLACK	
125	OBSIDIAN	YES	SURFACE	3	BLACK	
126	OBSIDIAN	YES	SURFACE	3	BLACK	
127	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
128	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
129	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
130	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
131	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
132	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
133	OBSIDIAN	YES	SURFACE	4	RED/BLACK	
134	OBSIDIAN	YES	SURFACE	1	BLACK	
135	OBSIDIAN	YES	SURFACE	1	BLACK	
136	OBSIDIAN	YES	SURFACE	1	BLACK	
137	OBSIDIAN	YES	SURFACE	1	BLACK	
138	OBSIDIAN	YES	SURFACE	1	BLACK	
139	OBSIDIAN	YES	SURFACE	1	BLACK	
140	OBSIDIAN	YES	SURFACE	1	BLACK	
141	OBSIDIAN	YES	SURFACE	1	BLACK	
142	OBSIDIAN	YES	SURFACE	1	BLACK	
143	OBSIDIAN	YES	SURFACE	1	BLACK	
144	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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145	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
146	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
147	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
148	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
149	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
150	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
151	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
152	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
153	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
154	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
155	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
156	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
157	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
158	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
159	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
160	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
161	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
162	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
163	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
164	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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166	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
167	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
168	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
169	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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171	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
172	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
173	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
174	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
175	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
176	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
177	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
178	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
179	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
180	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
181	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
182	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
183	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
184	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
185	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
186	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
187	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
188	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
189	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
190	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
191	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
192	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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193	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
194	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
195	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
196	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
197	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
198	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
199	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
200	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
201	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
202	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
203	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
204	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
205	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
206	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
207	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
208	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
209	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
210	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
211	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
212	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
213	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
214	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
215	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
216	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
217	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
218	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
219	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
220	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
221	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
222	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
223	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
224	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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228	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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233	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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236	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
237	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
238	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
239	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
240	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

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241	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
242	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
243	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
244	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
245	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
246	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
247	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
248	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
249	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
250	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
251	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
252	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
253	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
254	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
255	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
256	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
257	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
258	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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260	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
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262	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
263	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
264	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
265	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
266	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
267	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
268	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
269	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
270	OBSIDIAN	YES	SURFACE	2	BLACK	
271	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
272	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
273	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
274	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
275	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
276	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
277	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
278	OBSIDIAN	YES	SURFACE	3	BLACK	
279	OBSIDIAN	YES	SURFACE	3	BLACK	
280	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
281	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
282	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
283	OBSIDIAN	YES	SURFACE	4	RED/BLACK	
284					**TOTAL**	
285					**AVERAGE**	
286						
287					**COLOR**	**TOTAL**
288					**BLACK**	**34**

	G	H	I	J	K	L
289					**RED/BLACK**	**249**
290					**TOTAL**	**283**
291						
292						
293						
294						

	M	N	O	P	Q	R
1	**BORDIAN**	**#RET.EDGE**	**RET.INTENS.**	**F. LENGTH**	**F. WIDTH**	**F. THICKNSS**
2	BLADE	2		9.98	6.50	1.46
3	BLADE	2		8.21	5.84	1.28
4	BIFACE	2		11.47	6.79	2.32
5	BIFACE	0		13.51	7.66	3.39
6	BLADDE	2		11.89	5.68	1.80
7	BLADE	2		7.68	7.83	2.70
8	BIFACE	2		8.78	5.97	3.07
9	BIFACE	0		5.60	6.41	3.55
10		0		3.99	3.35	0.21
11		0		2.46	0.83	0.25
12		0		3.36	3.74	7.10
13		0		11.22	3.38	1.62
14		0		7.28	4.26	1.75
15		0		3.42	1.67	0.30
16		0		3.06	1.71	0.37
17		0		3.17	2.00	0.24
18		0		2.52	1.60	0.25
19		0		3.01	1.58	0.33
20		0		5.94	7.05	0.74
21		0		4.65	2.99	0.64
22		0		8.90	3.73	1.22
23		0		4.91	2.75	0.88
24		0		3.72	2.49	0.44
25		0		2.42	1.56	0.48
26		0		8.06	5.40	1.61
27		0		8.67	3.36	1.27
28		0		3.36	1.52	0.47
29		0		2.50	1.45	0.24
30		0		3.33	1.57	0.45
31		0		1.54	1.43	0.21
32		0		4.79	2.97	0.63
33		0		4.39	2.30	0.67
34		0		3.25	1.68	0.79
35		0		4.48	2.92	1.10
36		0		1.89	1.25	0.39
37		0		6.06	4.68	1.30
38		0		5.57	3.41	0.52
39		0		4.32	1.74	0.39
40		0		4.32	2.48	0.55
41		0		4.57	1.39	0.76
42		0		3.29	1.59	0.28
43		0		3.33	2.74	0.59
44		0		2.93	1.58	0.88
45		0		3.69	3.76	0.92
46		0		10.94	5.92	2.73
47		0		9.33	5.04	1.40
48		0		14.27	5.87	4.41

	M	N	O	P	Q	R
49		0		9.59	7.84	2.69
50		0		9.11	6.44	3.15
51		0		6.69	5.45	3.17
52		0		7.31	5.31	3.57
53		0		3.16	0.86	0.76
54		0		1.68	1.28	0.61
55		0		1.32	0.94	0.07
56		0		2.43	1.43	0.62
57		0		2.85	0.77	0.60
58		0		2.82	1.18	0.74
59		0		1.60	1.70	0.72
60		0		1.05	0.98	0.75
61		0		1.20	0.72	0.07
62		0		1.28	0.50	0.23
63		0		2.62	1.20	0.37
64		0		5.19	1.49	0.52
65		0		1.74	1.55	0.63
66		0		1.97	1.17	0.66
67		0		1.32	0.68	0.15
68		0		7.60	5.74	2.12
69		0		4.16	3.31	1.52
70		0		2.63	2.73	1.30
71		0		1.75	1.48	0.60
72		0		2.08	2.08	0.48
73		0		2.49	1.48	0.19
74		0		2.02	1.90	0.18
75		0		1.84	1.38	0.13
76		0		1.51	0.84	0.16
77		0		1.67	0.94	0.24
78		0		1.67	0.65	0.21
79		0		1.35	0.65	0.11
80		0		1.09	0.75	0.16
81		0		5.73	4.35	2.14
82		0		4.70	3.04	2.46
83		0		3.05	1.44	0.38
84		0		3.02	2.58	0.31
85		0		1.72	1.31	0.13
86		0		2.67	1.11	0.64
87		0		2.66	1.52	0.33
88		0		2.01	1.68	0.27
89		0		2.48	1.95	0.27
90		0		2.42	0.42	0.27
91		0		1.89	1.19	0.41
92		0		2.21	1.54	0.24
93		0		2.71	1.68	0.25
94		0		2.06	1.15	0.14
95		0		1.73	1.14	0.46
96		0		1.83	1.43	0.77

	M	N	O	P	Q	R
97		0		2.05	0.92	0.39
98		0		1.78	1.52	0.20
99		0		1.69	1.01	0.11
100		0		1.75	1.30	0.44
101		0		2.01	0.98	0.40
102		0		1.46	0.77	0.20
103		0		1.35	0.71	0.09
104		0		4.39	2.19	1.10
105		0		3.16	2.18	1.20
106		0		3.26	0.82	0.76
107		0		3.83	2.57	1.09
108		0		2.76	1.07	0.53
109		0		1.89	0.88	0.15
110		0		3.70	2.26	0.75
111		0		1.62	1.32	0.47
112		0		2.56	2.41	0.43
113		0		3.17	1.52	0.98
114		0		3.18	2.48	1.58
115		0		3.16	1.16	1.08
116		0		5.46	3.09	2.35
117		0		2.08	1.59	0.73
118		0		3.64	1.98	1.62
119		0		4.66	1.92	1.11
120		0		1.96	1.71	0.36
121		0		7.26	3.57	2.36
122		0		2.49	1.63	1.23
123		0		44.55	3.46	1.04
124		0		2.31	1.45	0.71
125		0		2.96	2.65	1.88
126		0		3.44	2.08	1.40
127		0		2.23	1.87	0.78
128		0		6.17	4.52	3.18
129		0		2.85	1.94	0.93
130		0		1.85	1.10	0.58
131		0		2.29	1.71	0.90
132		0		3.48	2.61	1.43
133		0		6.03	3.52	1.88
134		0		4.32	1.35	0.62
135		0		1.32	2.19	0.17
136		0		1.17	2.13	0.30
137		0		2.64	1.37	0.69
138		0		2.54	2.08	0.52
139		0		2.34	1.67	0.25
140		0		1.65	2.21	0.18
141		0		2.09	1.17	0.41
142		0		1.05	1.22	0.19
143		0		3.39	1.28	0.50
144		0		2.25	1.65	0.19

	M	N	O	P	Q	R
145		0		2.62	2.36	0.38
146		0		1.75	1.74	0.40
147		0		5.07	2.47	1.37
148		0		1.67	1.77	0.31
149		0		9.71	6.18	1.25
150		0		3.93	2.89	0.36
151		0		4.22	3.10	1.04
152		0		3.17	2.20	0.52
153		0		2.90	2.22	0.30
154		0		3.06	2.59	0.27
155		0		2.72	1.98	0.29
156		0		2.21	1.68	0.18
157		0		1.92	2.31	0.17
158		0		2.37	1.89	0.52
159		0		2.24	1.76	0.27
160		0		1.54	1.90	0.63
161		0		3.33	1.33	0.32
162		0		2.17	1.28	0.19
163		0		2.45	1.04	0.61
164		0		2.68	2.17	0.40
165		0		1.57	2.57	0.37
166		0		1.59	1.29	0.23
167		0		2.14	2.09	0.35
168		0		1.24	1.82	0.43
169		0		1.48	1.36	0.34
170		0		1.26	2.16	0.23
171		0		1.29	0.96	0.30
172		0		2.11	1.50	0.32
173		0		1.08	1.81	0.21
174		0		5.24	7.63	1.73
175		0		5.76	4.43	1.54
176		0		4.74	4.29	0.60
177		0		2.62	4.91	0.54
178		0		5.18	2.18	1.19
179		0		4.34	2.99	0.59
180		0		4.09	5.07	1.22
181		0		2.07	3.16	0.57
182		0		2.32	2.66	0.46
183		0		2.65	3.79	0.79
184		0		2.25	2.61	0.28
185		0		3.12	2.43	1.01
186		0		2.07	2.90	0.22
187		0		1.28	2.78	0.44
188		0		2.61	1.34	58.00
189		0		2.13	0.87	0.53
190		0		1.59	1.10	0.23
191		0		1.39	1.61	0.44
192		0		1.23	1.12	0.15

	M	N	O	P	Q	R
193		0		1.42	2.22	0.36
194		0		1.60	1.48	0.15
195		0		1.13	1.27	0.29
196		0		6.20	4.78	2.13
197		0		3.01	2.96	0.66
198		0		2.40	2.92	0.96
199		0		2.31	3.01	0.78
200		0		3.01	2.38	0.57
201		0		2.22	2.57	0.39
202		0		2.87	2.52	0.50
203		0		2.78	0.73	0.33
204		0		2.09	1.88	0.40
205		0		3.09	1.37	0.28
206		0		1.92	2.42	0.27
207		0		3.00	1.83	0.67
208		0		2.43	0.98	0.35
209		0		2.48	1.14	0.28
210		0		2.28	2.53	0.37
211		0		3.17	1.46	0.54
212		0		3.74	1.75	0.26
213		0		2.86	1.99	0.29
214		0		3.09	1.94	0.23
215		0		2.45	1.58	0.25
216		0		2.51	1.42	0.82
217		0		1.71	0.94	0.13
218		0		1.11	1.67	0.13
219		0		2.18	1.28	0.41
220		0		2.09	1.61	0.13
221		0		1.35	2.03	0.21
222		0		1.91	1.75	0.24
223		0		1.36	1.27	0.18
224		0		2.04	1.10	0.44
225		0		2.41	1.56	0.17
226		0		2.04	0.92	0.23
227		0		1.02	1.60	0.18
228		0		1.26	1.95	0.12
229		0		1.59	0.92	0.19
230		0		1.47	1.30	0.21
231		0		1.69	1.06	0.34
232		0		1.10	0.79	0.13
233		0		1.13	1.70	0.26
234		0		1.01	1.87	0.17
235		0		0.99	1.37	0.26
236		0		4.08	3.67	0.55
237		0		6.49	2.91	1.74
238		0		4.65	2.90	1.04
239		0		2.73	2.24	0.50
240		0		1.60	1.85	0.37

	M	N	O	P	Q	R
241		0		2.21	1.90	0.40
242		0		3.90	1.71	0.41
243		0		1.94	3.04	0.45
244		0		2.41	2.02	0.44
245		0		1.00	1.20	0.23
246		0		1.85	1.29	0.14
247		0		1.91	1.17	0.23
248		0		2.99	4.91	1.05
249		0		3.62	4.99	1.35
250		0		3.74	2.71	1.43
251		0		1.80	3.61	0.86
252		0		3.40	3.67	0.98
253		0		1.77	1.63	0.20
254		0		2.66	3.04	0.49
255		0		3.07	4.16	0.77
256		0		5.66	3.34	1.97
257		0		2.55	2.31	0.65
258		0		3.80	2.97	0.43
259		0		8.86	5.51	2.08
260		0		3.78	2.30	0.58
261		0		6.15	3.99	1.66
262		0		3.36	4.41	1.18
263		0		2.91	2.74	0.36
264		0		3.95	3.70	1.13
265		0		2.10	2.35	0.75
266		0		3.26	2.74	0.34
267		0		2.57	2.33	0.59
268		0		2.33	2.18	0.48
269		0		5.08	3.76	0.48
270		0		3.27	0.20	1.29
271		0		6.93	6.07	1.67
272		0		4.30	2.83	0.93
273		0		4.27	2.14	1.06
274		0		6.32	5.31	2.69
275		0		3.64	2.61	0.95
276		0		4.86	3.51	0.75
277		0		1.79	3.74	1.09
278		0		3.67	2.04	1.10
279		0		2.57	4.47	1.79
280		0		2.07	1.82	0.55
281		0		4.71	3.64	1.14
282		0		5.10	3.70	1.35
283		0		4.68	3.54	1.65
284		**12.00**		**987.00**	**684.14**	**280.01**
285		**0.04**		**3.49**	**2.42**	**0.99**
286						
287	**AVERAGE**					
288	**0.120**					

	M	N	O	P	Q	R
289	0.880					
290						
291						
292						
293						
294						

	S	T	U
1	PLAT.THICK.	PLAT.WIDTH	FRAGMENT
2	0.65	1.26	0
3	1.25	2.70	0
4	0.00	0.00	0
5	0.00	0.00	0
6	0.00	0.00	0
7	1.29	3.58	0
8	0.00	0.00	0
9	0.00	0.00	0
10	0.26	1.43	0
11	0.23	0.70	0
12	0.22	1.40	0
13	1.12	2.84	0
14	0.94	2.77	0
15	0.17	0.28	0
16	0.18	1.51	0
17	0.14	1.73	0
18	0.21	0.71	0
19	0.06	0.75	0
20	0.66	1.67	0
21	0.13	1.01	0
22	0.88	3.02	0
23	0.18	0.46	0
24	0.20	1.79	0
25	0.13	0.56	0
26	1.27	4.85	0
27	0.47	1.69	0
28	0.15	1.23	0
29	0.14	1.25	0
30	0.15	0.54	0
31	0.10	0.37	0
32	0.63	2.30	0
33	0.35	0.77	0
34	0.62	1.52	0
35	0.49	1.35	0
36	0.28	0.62	0
37	0.38	2.04	0
38	0.46	1.49	0
39	0.38	1.24	0
40	0.51	1.37	0
41	0.30	0.71	0
42	0.21	0.84	0
43	0.40	1.47	0
44	0.15	0.29	0
45	0.88	1.61	0
46	0.84	1.88	0
47	0.88	3.16	0
48	3.40	3.26	0

	S	T	U
49	1.70	3.32	0
50	2.03	2.21	0
51	4.65	2.70	0
52	2.96	4.46	0
53	0.00	0.00	3
54	0.00	0.00	2
55	0.00	0.00	2
56	0.00	0.00	3
57	0.00	0.00	3
58	0.00	0.00	3
59	0.00	0.00	2
60	0.00	0.00	2
61	0.00	0.00	2
62	0.00	0.00	2
63	0.00	0.00	3
64	0.00	0.00	4
65	0.00	0.00	2
66	0.00	0.00	2
67	0.00	0.00	2
68	0.00	0.00	5
69	0.00	0.00	4
70	0.00	0.00	3
71	0.00	0.00	2
72	0.00	0.00	3
73	0.00	0.00	3
74	0.00	0.00	3
75	0.00	0.00	2
76	0.00	0.00	2
77	0.00	0.00	2
78	0.00	0.00	2
79	0.00	0.00	2
80	0.00	0.00	2
81	0.00	0.00	4
82	0.00	0.00	4
83	0.00	0.00	3
84	0.00	0.00	3
85	0.00	0.00	2
86	0.00	0.00	3
87	0.00	0.00	3
88	0.00	0.00	2
89	0.00	0.00	3
90	0.00	0.00	3
91	0.00	0.00	2
92	0.00	0.00	3
93	0.00	0.00	3
94	0.00	0.00	3
95	0.00	0.00	2
96	0.00	0.00	2

	S	T	U
97	0.00	0.00	3
'98	0.00	0.00	2
99	0.00	0.00	2
100	0.00	0.00	2
101	0.00	0.00	2
102	0.00	0.00	2
103	0.00	0.00	2
104	0.00	0.00	4
105	0.00	0.00	3
106	0.00	0.00	3
107	0.00	0.00	3
108	0.00	0.00	3
109	0.00	0.00	2
110	0.00	0.00	3
111	0.00	0.00	2
112	0.00	0.00	3
113	0.00	0.00	3
114	0.00	0.00	3
115	0.00	0.00	3
116	0.00	0.00	4
117	0.00	0.00	3
118	0.00	0.00	3
119	0.00	0.00	4
120	0.00	0.00	2
121	0.00	0.00	5
122	0.00	0.00	3
123	0.00	0.00	4
124	0.00	0.00	3
125	0.00	0.00	3
126	0.00	0.00	3
127	0.00	0.00	3
128	0.00	0.00	5
129	0.00	0.00	3
130	0.00	0.00	2
131	0.00	0.00	3
132	0.00	0.00	3
133	0.00	0.00	5
134	0.18	0.35	4
135	0.16	0.49	2
136	0.21	0.83	2
137	0.19	0.29	3
138	0.31	0.62	3
139	0.05	0.39	3
140	0.13	0.41	2
141	0.33	0.56	3
142	0.14	0.88	1
143	0.24	1.10	4
144	0.15	0.33	3

	S	T	U
145	0.19	0.66	3
146	0.34	0.72	2
147	0.14	0.70	4
148	0.30	0.96	2
149	0.36	1.04	6
150	0.14	0.78	3
151	0.70	1.62	4
152	0.41	2.18	3
153	0.25	1.48	3
154	0.16	1.12	4
155	0.40	0.61	3
156	0.02	0.51	3
157	0.16	1.58	3
158	0.52	1.76	3
159	0.14	0.73	3
160	0.14	0.38	2
161	0.10	0.08	3
162	0.04	0.15	3
163	0.18	0.55	3
164	0.23	1.24	3
165	0.21	1.13	2
166	0.06	0.21	2
167	0.18	1.98	3
168	0.32	0.86	2
169	0.34	1.38	2
170	0.23	0.78	2
171	0.29	0.92	2
172	0.09	0.21	3
173	0.21	0.56	2
174	0.87	4.41	4
175	0.59	2.41	4
176	0.45	2.98	4
177	0.54	2.12	3
178	0.19	0.33	4
179	0.14	0.93	4
180	0.19	3.33	4
181	0.54	1.40	3
182	0.25	1.38	3
183	0.41	1.73	3
184	0.28	2.66	3
185	0.29	0.60	3
186	0.17	1.05	3
187	0.28	0.85	2
188	0.58	0.77	3
189	0.33	0.47	3
190	0.20	0.95	2
191	0.25	1.13	2
192	0.11	0.28	2

	S	T	U
193	0.36	1.54	2
194	0.09	0.35	2
195	0.29	0.61	2
196	0.91	3.91	5
197	0.29	0.69	3
198	0.96	2.93	3
199	0.79	3.02	3
200	0.36	1.48	3
201	0.29	2.14	3
202	0.21	0.57	3
203	0.29	0.36	3
204	0.05	0.40	3
205	0.16	0.40	3
206	0.23	1.10	3
207	0.29	0.64	3
208	0.22	0.41	3
209	0.18	0.60	3
210	0.22	0.63	3
211	0.03	0.42	3
212	0.27	1.29	3
213	0.07	0.48	3
214	0.18	1.15	3
215	0.03	0.69	3
216	0.08	0.33	3
217	0.09	0.20	2
218	0.14	0.55	2
219	0.17	1.25	3
220	0.10	0.47	3
221	0.08	0.38	2
222	0.16	0.34	2
223	0.17	0.54	2
224	0.11	0.63	3
225	0.05	0.59	3
226	0.08	0.20	2
227	0.07	0.56	2
228	0.08	0.71	2
229	0.05	0.35	2
230	0.12	1.31	2
231	0.29	1.01	2
232	0.11	0.49	2
233	0.21	0.50	2
234	0.18	0.79	2
235	0.09	0.33	1
236	0.48	2.58	4
237	0.21	2.22	5
238	0.32	1.15	4
239	0.25	1.10	3
240	0.24	1.29	2

	S	T	U
241	0.35	1.71	3
242	0.09	0.26	3
243	0.25	2.55	2
244	0.37	0.94	3
245	0.13	0.61	2
246	0.06	0.97	2
247	0.17	1.17	2
248	0.45	3.53	3
249	0.30	3.58	3
250	0.56	1.45	3
251	0.20	0.67	2
252	0.85	1.88	3
253	0.21	1.28	3
254	0.35	1.13	5
255	0.66	2.64	3
256	1.67	3.38	4
257	0.45	1.36	3
258	0.21	1.41	3
259	0.54	2.11	6
260	0.22	2.09	3
261	1.54	3.56	5
262	1.18	2.98	3
263	0.30	1.53	3
264	0.62	1.51	4
265	0.75	1.03	2
266	0.26	1.24	3
267	0.45	1.22	3
268	0.17	0.75	3
269	0.15	1.61	4
270	0.11	0.45	3
271	0.89	2.57	5
272	0.33	1.24	4
273	0.79	1.30	4
274	0.91	3.66	5
275	0.62	2.03	3
276	0.71	2.67	4
277	0.38	1.24	2
278	1.10	1.76	3
279	0.17	1.70	3
280	0.27	0.67	3
281	0.92	2.71	4
282	0.45	1.19	4
283	0.89	1.87	4
284	**82.03**	**262.51**	**672.00**
285	**0.29**	**0.93**	**2.37**
286			
287	**% CORTEX**	**TOTAL**	**AVERAGE**
288	**0%**	**239**	**0.845**

	S	T	U
289	0-10%	25	0.088
290	10-40%	17	0.060
291	40-60%	2	0.007
292	60-90%	0	0.000
293	90-100%	0	0.000
294		283	

	A	B	C	D	E	F
1	ARTIFACT	PLATFORM	SPLIT FLAKE	HYDRATION	P.LIPPING	PLAT.PREP.
2	BIFACE					
3	BIFACE					
4	BIFACE					
5	BIFACE					
6	BIFACE					
7	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
8	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
9	DEBRIS					
10	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
11	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
12	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
13	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
14	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
15	DEBRIS					
16	DEBRIS					
17	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
18	COMPFLAKE	FACETED	YES	MEDIUM	NO	
19	COMPFLAKE	FACETED	YES	MEDIUM	NO	
20	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
21	COMPFLAKE	FACETED	YES	MEDIUM	NO	
22	COMPTOOL					
23	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
24	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
25	COMPFLAKE	FACETED	YES	HEAVY	NO	
26	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
27	DEBRIS					
28	DEBRIS					
29	DEBRIS					
30	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
31	DEBRIS					
32	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
33	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
34	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
35	DEBRIS					
36	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
37	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
38	DEBRIS					
39	COMPFLAKE	FACETED	YES	HEAVY	NO	
40	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
41	DEBRIS					
42	COMPFLAKE	FACETED	YES	HEAVY	NO	
43	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
44	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
45	DEBRIS					
46	DEBRIS					
47	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
48	DEBRIS					

	A	B	C	D	E	F
49	DEBRIS					
50	DEBRIS					
51	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
52	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
53	DEBRIS					
54	DEBRIS					
55	DEBRIS					
56	DEBRIS					
57	DEBRIS					
58	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
59	DEBRIS					
60	DEBRIS					
61	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
62	DEBRIS					
63	DEBRIS					
64	COMPFLAKE	FACETED	YES	HEAVY	NO	
65	DEBRIS					
66	DEBRIS					
67	DEBRIS					
68	DEBRIS					
69	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
70	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
71	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
72	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
73	PROXFLAKE	CORTICAL	NO	HEAVY	NO	TRIM
74	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
75	DEBRIS					
76	DEBRIS					
77	DEBRIS					
78	DEBRIS					
79	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
80	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
81	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
82	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
83	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
84	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
85	COMPFLAKE	FACETED	YES	HEAVY	NO	
86	COMPFLAKE	FACETED	YES	HEAVY	NO	
87	COMPFLAKE	FACETED	YES	HEAVY	NO	
88	DEBRIS					
89	DEBRIS					
90	DEBRIS					
91	COMPFLAKE	FACETED	YES	HEAVY	NO	
92	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
93	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
94	DEBRIS					
95	DEBRIS					
96	DEBRIS					

	A	B	C	D	E	F
97	DEBRIS					
98	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
99	DEBRIS					
100	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
101	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
102	DEBRIS					
103	DEBRIS					
104	DEBRIS					
105	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
106	DEBRIS					
107	DEBRIS					
108	DEBRIS					
109	DEBRIS					
110	DEBRIS					
111	DEBRIS					
112	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
113	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
114	DEBRIS					
115	COMPFLAKE	FACETED	YES	HEAVY	NO	
116	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
117	DEBRIS					
118	DEBRIS					
119	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
120	DEBRIS					
121	DEBRIS					
122	DEBRIS					
123	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
124	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
125	COMPFLAKE	FACETED	YES	MEDIUM	NO	
126	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
127	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
128	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
129	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
130	DEBRIS					
131	DEBRIS					
132	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
133	DEBRIS					
134	COMPFLAKE	FACETED	YES	MEDIUM	NO	
135	PROXFLAKE	PLAIN	YES	MEDIUM	NO	TRIM
136	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
137	COMPFLAKE	FACETED	YES	MEDIUM	NO	
138	COMPFLAKE	FACETED	YES	MEDIUM	NO	
139	DEBRIS					
140	COMPFLAKE	FACETED	YES	MEDIUM	NO	
141	DEBRIS					
142	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
143	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
144	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM

	A	B	C	D	E	F
145	DEBRIS					
146	DEBRIS					
147	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	GRIND
148	DEBRIS					
149	COMPFLAKE	FACETED	YES	HEAVY	NO	
150	COMPFLAKE	FACETED	YES	HEAVY	NO	
151	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
152	DEBRIS					
153	DEBRIS					
154	DEBRIS					
155	DEBRIS					
156	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
157	PROXFLAKE	PLAIN	YES	HEAVY	YES	TRIM
158	DEBRIS					
159	DEBRIS					
160	DEBRIS					
161	DEBRIS					
162	COMPFLAKE	FACETED	YES	HEAVY	NO	
163	DEBRIS					
164	DEBRIS					
165	DEBRIS					
166	DEBRIS					
167	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
168	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
169	DEBRIS					
170	DEBRIS					
171	DEBRIS					
172	DEBRIS					
173	DEBRIS					
174	DEBRIS					
175	DEBRIS					
176	DEBRIS					
177	COMPFLAKE	FACETED	YES	MEDIUM	NO	
178	COMPFLAKE	FACETED	YES	HEAVY	NO	
179	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
180	DEBRIS					
181	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
182	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
183	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
184	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
185	DEBRIS					
186	DEBRIS					
187	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
188	DEBRIS					
189	DEBRIS					
190	DEBRIS					
191	DEBRIS					
192	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND

	A	B	C	D	E	F
193	DEBRIS					
194	DEBRIS					
195	DEBRIS					
196	DEBRIS					
197	DEBRIS					
198	DEBRIS					
199	DEBRIS					
200	DEBRIS					
201	DEBRIS					
202	DEBRIS					
203	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
204	DEBRIS					
205	DEBRIS					
206	DEBRIS					
207	DEBRIS					
208	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
209	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
210	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
211	DEBRIS					
212	COMPFLAKE	FACETED	YES	MEDIUM	NO	
213	COMPFLAKE	CORTICAL	YES	MEDIUM	NO	
214	PROXFLAKE	CORTICAL	YES	MEDIUM	NO	TRIM
215	PROXFLAKE	FACETED	YES	MEDIUM	NO	GRIND
216	COMPFLAKE	FACETED	YES	MEDIUM	NO	
217	COMPFLAKE	FACETED	YES	MEDIUM	NO	
218	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
219	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
220	DEBRIS					
221	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
222	COMPFLAKE	FACETED	YES	HEAVY	NO	
223	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
224	PROXFLAKE	PLAIN	YES	HEAVY	NO	TRIM
225	DEBRIS					
226	COMPFLAKE	FACETED	YES	HEAVY	NO	
227	DEBRIS					
228	PROXFLAKE	CORTICAL	YES	HEAVY	NO	TRIM
229	DEBRIS					
230	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
231	COMPFLAKE	FACETED	YES	HEAVY	NO	
232	DEBRIS					
233	DEBRIS					
234	DEBRIS					
235	COMPFLAKE	FACETED	YES	HEAVY	YES	
236	COMPFLAKE	FACETED	YES	HEAVY	YES	
237	DEBRIS					
238	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
239	DEBRIS					
240	PROXFLAKE	FACETED	YES	HEAVY	NO	TRIM

	A	B	C	D	E	F
241	COMPFLAKE	FACETED	YES	HEAVY	NO	
242	DEBRIS					
243	PROXFLAKE	FACETED	YES	HEAVY	YES	GRIND
244	PROXFLAKE	FACETED	YES	HEAVY	NO	GRIND
245	DEBRIS					
246	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
247	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
248	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
249	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
250	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
251	COMPFLAKE	CORTICAL	YES	HEAVY	NO	
252	CORE					
253	CORE					
254	CORE					
255	CORE					
256	COREFRAG					
257	COREFRAG					
258						
259						
260	**Artifact**	**Total**	**Average**	**Artifact**	**Total**	**Average**
261	**BIFACE**	**5**	**0.020**	**COMPFLAKE**	**55**	**0.215**
262	**COREFRAG**	**2**	**0.008**	**COMPTOOL**	**1**	**0.004**
263	**CORE**	**4**	**0.016**	**DEBRIS**	**120**	**0.469**
264	**PROXFLAKE**	**69**	**0.270**	**SUB-TOTAL**	**176**	
265	**SUB-TOTAL**	**80**		**TOTAL**	**256**	

	G	H	I	J	K	L
1	**MATERIAL**	**SURFACE**	**LEVEL**	**% CORTEX**	**COLOR**	**TERM. TYPE.**
2	OBSIDIAN	YES	SURFACE	1	BLACK	
3	OBSIDIAN	YES	SURFACE	3	BLACK	
4	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
5	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
6	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
7	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
8	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
9	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
10	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
11	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
12	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
13	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
14	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
15	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
16	OBSIDIAN	YES	SURFACE	3	BLACK	
17	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
18	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
19	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
20	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
21	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
22	OBSIDIAN	YES	SURFACE	7	RED/BLACK	
23	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
24	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
25	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
26	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
27	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
28	OBSIDIAN	YES	SURFACE	1	BLACK	
29	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
30	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
31	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
32	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
33	OBSIDIAN	YES	SURFACE	3	RED/BLACK	NORMAL
34	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
35	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
36	OBSIDIAN	YES	SURFACE	3	RED/BLACK	OVERSHOT
37	OBSIDIAN	YES	SURFACE	1	BLACK	
38	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
39	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
40	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
41	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
42	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
43	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
44	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
45	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
46	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
47	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
48	OBSIDIAN	YES	SURFACE	2	BLACK	

	G	H	I	J	K	L
49	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
50	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
51	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
52	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
53	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
54	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
55	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
56	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
57	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
58	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
59	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
60	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
61	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
62	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
63	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
64	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
65	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
66	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
67	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
68	OBSIDIAN	YES	SURFACE	1	BLACK	
69	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
70	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
71	OBSIDIAN	YES	SURFACE	3	RED/BLACK	HINGE
72	OBSIDIAN	YES	SURFACE	2	RED/BLACK	OVERSHOT
73	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
74	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
75	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
76	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
77	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
78	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
79	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
80	OBSIDIAN	YES	SURFACE	1	BLACK	
81	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
82	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
83	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
84	OBSIDIAN	YES	SURFACE	1	BLACK	
85	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
86	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
87	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
88	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
89	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
90	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
91	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
92	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
93	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
94	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
95	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
96	OBSIDIAN	YES	SURFACE	2	RED/BLACK	

	G	H	I	J	K	L
97	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
98	OBSIDIAN	YES	SURFACE	3	RED/BLACK	NORMAL
99	OBSIDIAN	YES	SURFACE	1	BLACK	
100	OBSIDIAN	YES	SURFACE	2	BLACK	
101	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
102	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
103	OBSIDIAN	YES	SURFACE	2	BLACK	
104	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
105	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
106	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
107	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
108	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
109	OBSIDIAN	YES	SURFACE	3	BLACK	
110	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
111	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
112	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
113	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
114	OBSIDIAN	YES	SURFACE	2	BLACK	
115	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
116	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
117	OBSIDIAN	YES	SURFACE	3	BLACK	
118	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
119	OBSIDIAN	YES	SURFACE	1	BLACK	
120	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
121	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
122	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
123	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
124	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
125	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
126	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
127	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
128	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
129	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
130	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
131	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
132	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
133	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
134	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
135	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
136	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
137	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
138	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
139	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
140	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
141	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
142	OBSIDIAN	YES	SURFACE	1	BLACK	
143	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
144	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

	G	H	I	J	K	L
145	OBSIDIAN	YES	SURFACE	1	BLACK	
146	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
147	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
148	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
149	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
150	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
151	OBSIDIAN	YES	SURFACE	3	BLACK	
152	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
153	OBSIDIAN	YES	SURFACE	1	BLACK	
154	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
155	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
156	OBSIDIAN	YES	SURFACE	2	BLACK	
157	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
158	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
159	OBSIDIAN	YES	SURFACE	1	BLACK	
160	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
161	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
162	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
163	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
164	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
165	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
166	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
167	OBSIDIAN	YES	SURFACE	1	BLACK	
168	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
169	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
170	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
171	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
172	OBSIDIAN	YES	SURFACE	1	BLACK	
173	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
174	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
175	OBSIDIAN	YES	SURFACE	1	BLACK	
176	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
177	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
178	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
179	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
180	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
181	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
182	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
183	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
184	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
185	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
186	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
187	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
188	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
189	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
190	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
191	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
192	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

	G	H	I	J	K	L
193	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
194	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
195	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
196	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
197	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
198	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
199	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
200	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
201	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
202	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
203	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
204	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
205	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
206	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
207	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
208	OBSIDIAN	YES	SURFACE	2	BLACK	
209	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
210	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
211	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
212	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
213	OBSIDIAN	YES	SURFACE	1	RED/BLACK	OVERSHOT
214	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
215	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
216	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
217	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
218	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
219	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
220	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
221	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
222	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
223	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
224	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
225	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
226	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
227	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
228	OBSIDIAN	YES	SURFACE	1	BLACK	
229	OBSIDIAN	YES	SURFACE	1	BLACK	
230	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
231	OBSIDIAN	YES	SURFACE	1	RED/BLACK	HINGE
232	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
233	OBSIDIAN	YES	SURFACE	1	BLACK	
234	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
235	OBSIDIAN	YES	SURFACE	1	BLACK	NORMAL
236	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
237	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
238	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
239	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
240	OBSIDIAN	YES	SURFACE	1	RED/BLACK	

	G	H	I	J	K	L
241	OBSIDIAN	YES	SURFACE	1	RED/BLACK	NORMAL
242	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
243	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
244	OBSIDIAN	YES	SURFACE	1	BLACK	
245	OBSIDIAN	YES	SURFACE	1	RED/BLACK	
246	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
247	OBSIDIAN	YES	SURFACE	2	RED/BLACK	HINGE
248	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
249	OBSIDIAN	YES	SURFACE	3	RED/BLACK	NORMAL
250	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
251	OBSIDIAN	YES	SURFACE	2	RED/BLACK	NORMAL
252	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
253	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
254	OBSIDIAN	YES	SURFACE	2	RED/BLACK	
255	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
256	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
257	OBSIDIAN	YES	SURFACE	3	RED/BLACK	
258		TOTAL				
259		AVERAGE				
260		COLOR	TOTAL	AVERAGE		
261		BLACK	39	0.152		
262		RED/BLAC	217	0.848		
263		TOTAL	256			
264						
265						

	M	N	O	P	Q	R
1	BORDIAN	#RET.EDGE	RET.INTENS.	F. LENGTH	F. WIDTH	F. THICKNSS
2	preform	2		11.63	4.64	1.67
3	preform	2		12.54	6.46	2.61
4	prreform	3		10.68	5.68	2.02
5	preform	3		12.64	8.50	3.15
6	preform	3		9.53	6.43	2.21
7		0		7.91	7.62	1.60
8		0		4.07	4.44	0.77
9		0		3.33	2.43	0.54
10		0		3.42	2.01	0.61
11		0		2.10	2.99	1.11
12		0		2.58	2.18	1.03
13		0		3.79	2.81	0.86
14		0		2.41	2.69	0.49
15		0		4.02	2.02	1.56
16		0		2.27	1.59	0.87
17		0		3.67	1.67	0.35
18		0		1.27	1.68	0.19
19		0		1.36	0.13	0.31
20		0		1.97	2.93	0.42
21		0		2.51	2.17	0.35
22	hammer stn	2	HEAVY	7.38	5.40	2.52
23		0		2.04	3.42	0.61
24		0		2.68	1.87	0.37
25		0		1.50	2.04	0.29
26		0		1.83	2.78	0.78
27		0		2.59	1.94	0.29
28		0		1.94	1.22	0.25
29		0		1.82	0.92	0.96
30		0		2.61	1.74	0.24
31		0		3.20	1.86	0.49
32		0		2.15	2.58	0.76
33		0		5.32	4.42	2.83
34		0		2.60	1.64	0.21
35		0		3.82	2.86	2.89
36		0		6.01	3.01	1.67
37		0		3.39	1.69	0.39
38		0		2.57	1.54	0.28
39		0		1.48	1.73	0.38
40		0		1.95	1.68	0.42
41		0		3.71	3.36	1.15
42		0		2.96	1.38	0.42
43		0		1.52	1.93	21.00
44		0		1.88	1.99	0.42
45		0		1.88	1.04	0.46
46		0		2.93	2.88	1.89
47		0		2.57	2.96	0.71
48		0		1.35	1.60	0.75

	M	N	O	P	Q	R
49		0		2.41	1.18	0.93
50		0		2.59	1.92	0.91
51		0		1.78	1.18	0.53
52		0		2.52	1.91	0.64
53		0		2.03	1.34	0.45
54		0		2.95	1.63	0.76
55		0		2.24	1.49	0.35
56		0		1.70	1.01	0.64
57		0		2.07	1.48	1.08
58		0		1.79	1.06	0.16
59		0		1.73	0.74	0.65
60		0		1.95	0.87	0.12
61		0		1.72	1.35	0.39
62		0		2.67	1.22	0.59
63		0		2.37	1.00	0.47
64		0		1.18	1.31	0.21
65		0		2.34	0.71	0.41
66		0		2.51	0.98	0.27
67		0		1.53	1.02	0.71
68		0		1.26	0.77	0.48
69		0		10.04	6.28	2.17
70		0		7.29	7.52	1.30
71		0		9.81	5.29	2.31
72		0		9.68	6.05	3.10
73		0		5.89	5.33	1.31
74		0		4.94	7.19	1.18
75		0		6.60	5.45	3.01
76		0		4.32	1.76	1.52
77		0		6.46	5.32	3.69
78		0		2.88	3.06	0.67
79		0		2.28	1.96	0.21
80		0		4.34	6.73	1.15
81		0		3.73	3.89	1.49
82		0		4.55	1.64	0.46
83		0		6.72	1.80	1.19
84		0		4.44	1.91	1.01
85		0		2.45	2.90	0.58
86		0		3.26	1.16	0.53
87		0		2.11	2.95	0.40
88		0		2.48	1.50	0.64
89		0		2.21	1.76	0.19
90		0		1.88	1.68	0.33
91		0		3.42	2.26	0.43
92		0		4.90	2.14	1.40
93		0		3.83	2.51	1.20
94		0		5.72	3.14	1.90
95		0		5.19	2.83	0.68
96		0		7.42	4.20	0.98

	M	N	O	P	Q	R
97		0		5.34	3.92	2.42
98		0		7.85	3.97	3.05
99		0		3.01	2.35	0.72
100		0		3.78	3.05	1.37
101		0		1.93	2.10	0.43
102		0		5.40	4.15	2.26
103		0		3.45	2.67	1.73
104		0		4.21	3.08	1.10
105		0		1.81	4.45	0.57
106		0		2.24	1.57	0.75
107		0		4.51	2.43	2.27
108		0		4.97	2.20	0.81
109		0		3.35	2.14	0.97
110		0		3.96	2.55	0.49
111		0		3.74	1.48	1.33
112		0		3.44	2.09	0.83
113		0		2.47	3.04	0.43
114		0		3.30	1.73	1.53
115		0		2.44	1.35	0.30
116		0		2.58	1.79	0.46
117		0		2.77	2.30	1.11
118		0		2.93	2.74	0.30
119		0		3.24	2.05	0.39
120		0		2.78	1.62	0.39
121		0		2.08	1.39	0.22
122		0		1.59	0.91	0.12
123		0		11.15	10.22	2.29
124		0		5.49	9.79	1.73
125		0		6.32	4.31	0.75
126		0		5.09	5.82	1.48
127		0		6.94	2.85	1.99
128		0		4.55	2.00	0.79
129		0		2.81	4.45	0.79
130		0		4.08	2.84	1.25
131		0		4.18	2.01	0.86
132		0		3.19	2.98	1.02
133		0		3.22	1.61	0.69
134		0		3.18	2.35	0.17
135		0		2.51	0.97	0.78
136		0		2.83	2.23	0.67
137		0		2.85	2.29	0.30
138		0		2.88	2.07	0.31
139		0		2.90	1.81	0.48
140		0		2.57	2.52	0.42
141		0		2.71	1.01	0.77
142		0		1.62	1.80	0.25
143		0		2.85	3.49	0.44
144		0		2.79	1.19	0.64

	M	N	O	P	Q	R
145		0		2.34	1.14	0.65
146		0		2.65	2.32	0.41
147		0		1.44	2.39	0.43
148		0		3.32	0.89	0.76
149		0		3.06	1.53	0.73
150		0		1.60	1.68	0.35
151		0		1.95	1.53	0.32
152		0		2.82	1.71	0.33
153		0		1.67	0.77	0.10
154		0		2.84	1.41	0.29
155		0		2.51	1.22	0.63
156		0		1.02	1.34	0.59
157		0		1.43	1.63	0.21
158		0		2.35	1.55	0.19
159		0		1.40	1.03	0.45
160		0		1.88	1.38	0.75
161		0		2.97	0.83	0.23
162		0		2.06	1.43	0.30
163		0		1.31	1.18	0.60
164		0		1.82	1.46	0.10
165		0		2.23	0.72	0.45
166		0		1.80	1.34	0.17
167		0		1.15	1.46	0.17
168		0		1.54	1.01	0.15
169		0		2.85	0.89	0.48
170		0		2.36	1.01	0.53
171		0		2.10	1.87	0.28
172		0		1.26	0.84	0.18
173		0		1.93	1.65	0.08
174		0		2.01	1.32	0.73
175		0		1.01	0.45	0.05
176		0		2.60	0.78	0.71
177		0		2.17	0.94	0.22
178		0		1.32	1.88	0.19
179		0		1.23	1.91	0.38
180		0		2.39	1.49	0.32
181		0		1.96	1.11	0.11
182		0		1.61	0.74	0.33
183		0		1.99	0.81	0.29
184		0		1.57	1.24	0.19
185		0		1.62	1.27	0.16
186		0		1.66	0.85	0.15
187		0		1.77	1.33	0.26
188		0		2.21	0.82	0.23
189		0		1.57	1.20	0.24
190		0		1.33	1.00	0.35
191		0		1.68	0.45	0.34
192		0		1.50	1.10	0.14

	M	N	O	P	Q	R
193		0		1.46	0.90	0.23
194		0		1.28	0.91	0.21
195		0		1.83	0.73	0.33
196		0		1.58	0.85	0.21
197		0		1.24	0.79	0.22
198		0		0.81	0.73	0.29
199		0		0.82	0.59	0.04
200		0		1.40	0.80	0.18
201		0		1.24	0.59	0.12
202		0		1.48	0.75	0.22
203		0		0.76	1.48	0.39
204		0		0.70	0.69	0.14
205		0		1.14	0.81	0.17
206		0		1.10	0.79	0.04
207		0		1.11	0.38	0.38
208		0		3.90	4.20	0.88
209		0		6.70	4.92	2.32
210		0		8.51	3.87	1.94
211		0		4.20	2.52	1.14
212		0		3.69	2.21	0.66
213		0		5.32	3.72	2.14
214		0		4.06	4.62	1.01
215		0		2.94	1.91	0.67
216		0		4.91	3.03	0.40
217		0		2.34	2.77	0.72
218		0		3.04	0.87	0.00
219		0		3.63	1.66	0.48
220		0		2.86	2.32	0.35
221		0		3.59	1.39	0.52
222		0		2.85	1.66	0.27
223		0		2.70	2.07	0.44
224		0		3.50	1.14	0.40
225		0		2.21	1.75	0.16
226		0		2.82	1.49	0.62
227		0		2.06	2.58	1.85
228		0		2.21	1.18	0.68
229		0		1.82	1.14	0.71
230		0		2.34	1.09	0.16
231		0		1.75	1.89	0.37
232		0		1.86	1.65	0.28
233		0		2.17	1.48	0.49
234		0		2.83	1.06	0.80
235		0		1.73	0.62	0.33
236		0		2.02	0.88	0.26
237		0		1.80	1.15	0.41
238		0		1.70	1.32	0.36
239		0		1.88	1.37	0.63
240		0		1.76	1.09	0.48

	M	N	O	P	Q	R
241		0		1.90	0.79	0.20
242		0		1.40	0.85	0.15
243		0		1.96	1.17	0.34
244		0		1.76	1.10	0.50
245		0		2.02	1.21	0.32
246		0		14.93	5.86	1.86
247		0		9.59	5.94	1.69
248		0		11.17	4.99	2.04
249		0		10.01	4.39	1.03
250		0		8.29	3.05	1.03
251		0		8.09	2.36	0.76
252		0		12.58	10.32	3.69
253		0		14.92	10.03	5.99
254		0		10.31	10.38	5.63
255		0		11.16	7.50	5.17
256		0		6.68	7.44	5.46
257		0		7.88	6.88	3.63
258		**15.00**	**0.00**	**882.60**	**613.23**	**239.03**
259		**0.06**	**0.00**	**3.45**	**2.40**	**0.93**
260				**% CORTEX**	**TOTAL**	**AVERAGE**
261				**0%**	**206**	**0.805**
262				**0-10%**	**24**	**0.094**
263				**10-40%**	**25**	**0.098**
264				**SUB-TOTAL**	**255**	
265						

	S	T	U
1	PLAT.THICK.	PLAT.WIDTH	FRAGMENT
2	0.49	2.76	0
3	1.17	1.88	0
4	1.24	2.86	0
5	0.00	0.00	0
6	0.00	0.00	0
7	1.44	5.59	0
8	0.55	2.28	0
9	0.00	0.00	3
10	0.28	0.71	0
11	0.28	1.28	2
12	0.62	0.88	3
13	0.47	1.64	0
14	0.49	0.39	3
15	0.00	0.00	3
16	0.00	0.00	3
17	0.23	0.83	0
18	0.08	1.13	0
19	0.14	0.72	0
20	0.18	1.36	2
21	0.20	1.47	0
22	0.00	0.00	0
23	0.34	0.78	3
24	0.29	1.86	3
25	0.14	0.62	0
26	0.78	2.75	2
27	0.00	0.00	3
28	0.00	0.00	2
29	0.00	0.00	2
30	0.24	1.60	3
31	0.00	0.00	3
32	0.59	2.43	3
33	1.05	1.79	0
34	0.03	0.97	3
35	0.00	0.00	4
36	1.43	1.48	0
37	0.23	0.84	3
38	0.00	0.00	3
39	0.26	0.68	0
40	0.05	1.29	2
41	0.00	0.00	3
42	0.09	0.35	0
43	0.16	1.32	2
44	0.08	1.19	2
45	0.00	0.00	2
46	0.00	0.00	3
47	0.20	1.21	3
48	0.00	0.00	2

	S	T	U
49	0.00	0.00	3
50	0.00	0.00	3
51	0.10	0.54	2
52	0.41	1.20	3
53	0.00	0.00	3
54	0.00	0.00	3
55	0.00	0.00	3
56	0.00	0.00	2
57	0.00	0.00	3
58	0.15	0.45	2
59	0.00	0.00	2
60	0.00	0.00	2
61	0.23	0.58	2
62	0.00	0.00	3
63	0.00	0.00	3
64	0.21	0.49	0
65	0.00	0.00	3
66	0.00	0.00	3
67	0.00	0.00	2
68	0.00	0.00	2
69	1.44	4.04	0
70	1.31	3.48	0
71	0.98	0.65	0
72	0.97	1.91	0
73	1.25	2.22	4
74	0.63	2.30	3
75	0.00	0.00	5
76	0.00	0.00	4
77	0.00	0.00	5
78	0.00	0.00	3
79	0.21	0.96	3
80	1.11	4.07	4
81	1.49	3.89	3
82	0.52	1.61	0
83	0.77	0.70	0
84	1.09	1.51	4
85	0.32	0.98	0
86	0.27	0.55	0
87	0.15	1.21	0
88	0.00	0.00	3
89	0.00	0.00	3
90	0.00	0.00	3
91	0.22	1.11	0
92	1.40	1.49	0
93	1.04	2.04	3
94	0.00	0.00	4
95	0.64	0.00	1
96	0.00	0.00	5

	S	T	U
97	0.00	0.00	4
98	1.32	2.96	0
99	0.00	0.00	3
100	0.50	1.43	3
101	0.46	1.20	2
102	0.00	0.00	4
103	0.00	0.00	3
104	0.00	0.00	4
105	0.31	1.00	2
106	0.00	0.00	3
107	0.00	0.00	4
108	0.00	0.00	4
109	0.00	0.00	3
110	0.00	0.00	4
111	0.00	0.00	3
112	0.39	0.81	3
113	0.34	1.73	3
114	0.00	0.00	3
115	0.10	0.93	0
116	0.44	1.23	3
117	0.00	0.00	3
118	0.00	0.00	3
119	0.17	0.60	3
120	0.00	0.00	3
121	0.00	0.00	3
122	0.00	0.00	2
123	1.35	3.78	0
124	0.72	3.13	4
125	0.49	1.09	0
126	0.77	1.58	4
127	0.63	1.13	0
128	0.39	1.39	0
129	0.40	1.13	3
130	0.00	0.00	4
131	0.00	0.00	4
132	0.52	0.90	3
133	0.00	0.00	3
134	0.09	1.44	0
135	0.30	0.47	3
136	0.16	0.86	3
137	0.20	0.86	0
138	0.21	1.00	0
139	0.00	0.00	3
140	0.19	0.82	0
141	0.00	0.00	3
142	0.19	0.66	2
143	0.22	1.77	3
144	0.66	0.81	3

	S	T	U
145	0.00	0.00	3
146	0.00	0.00	3
147	0.30	0.95	2
148	0.00	0.00	3
149	0.26	0.58	0
150	0.35	0.89	0
151	0.14	0.37	2
152	0.00	0.00	3
153	0.00	0.00	2
154	0.00	0.00	3
155	0.00	0.00	3
156	0.19	0.63	1
157	0.21	0.98	2
158	0.00	0.00	3
159	0.00	0.00	1
160	0.00	0.00	2
161	0.00	0.00	3
162	0.16	0.50	0
163	0.00	0.00	2
164	0.00	0.00	2
165	0.00	0.00	3
166	0.00	0.00	2
167	0.11	0.52	2
168	0.14	0.56	2
169	0.00	0.00	3
170	0.00	0.00	3
171	0.00	0.00	3
172	0.00	0.00	2
173	0.00	0.00	2
174	0.00	0.00	2
175	0.00	0.00	2
176	0.00	0.00	3
177	0.16	0.63	0
178	0.08	1.09	0
179	0.21	0.94	2
180	0.00	0.00	3
181	0.10	0.48	2
182	0.33	0.71	2
183	0.07	0.60	2
184	0.17	1.04	2
185	0.00	0.00	2
186	0.00	0.00	2
187	0.18	0.49	2
188	0.00	0.00	3
189	0.00	0.00	2
190	0.00	0.00	2
191	0.00	0.00	2
192	0.14	0.61	2

	S	T	U
193	0.00	0.00	2
194	0.00	0.00	2
195	0.00	0.00	2
196	0.00	0.00	2
197	0.00	0.00	2
198	0.00	0.00	1
199	0.00	0.00	1
200	0.00	0.00	2
201	0.00	0.00	2
202	0.00	0.00	2
203	0.35	1.45	1
204	0.00	0.00	1
205	0.00	0.00	2
206	0.00	0.00	2
207	0.00	0.00	2
208	0.98	4.21	3
209	0.66	2.42	5
210	1.15	2.86	0
211	0.00	0.00	4
212	0.17	0.59	0
213	2.11	3.53	0
214	1.03	2.53	4
215	0.58	0.96	3
216	0.39	0.38	0
217	0.30	1.67	0
218	0.14	0.57	3
219	0.37	0.82	0
220	0.00	0.00	3
221	0.14	0.90	3
222	0.24	2.16	0
223	0.44	1.04	3
224	0.33	1.03	3
225	0.00	0.00	2
226	0.50	0.93	0
227	0.00	0.00	3
228	0.31	0.51	3
229	0.00	0.00	2
230	0.11	1.24	3
231	0.16	1.19	0
232	0.00	0.00	2
233	0.00	0.00	3
234	0.00	0.00	3
235	0.33	0.68	0
236	0.18	0.93	0
237	0.00	0.00	2
238	0.35	0.46	2
239	0.00	0.00	2
240	0.23	0.23	2

	S	T	U
241	0.15	0.32	0
242	0.00	0.00	2
243	0.36	1.15	2
244	0.24	0.82	2
245	0.00	0.00	3
246	1.44	5.18	0
247	0.64	1.79	0
248	0.76	2.27	0
249	0.86	2.86	0
250	0.59	2.03	0
251	0.21	1.09	0
252	3.67	10.16	0
253	4.47	4.93	0
254	5.48	10.13	0
255	5.58	6.28	0
256	4.90	6.37	0
257	3.70	6.73	0
258	**90.15**	**226.87**	**501.00**
259	**0.35**	**0.89**	**1.96**
260	**% CORTEX**	**TOTAL**	**AVERAGE**
261	**40-60%**	**0**	**0.000**
262	**60-90%**	**0**	**0.000**
263	**90-100%**	**1**	**0.004**
264		**1**	
265	**TOTAL**	**256**	

	A	B	C	D	E	F
1	ARTIFACT	PLATFORM	SPLIT FLAKE	AMT. PATINA	P.LIPPING	PLAT.PREP.
2	COMPFLAKE	CORTICAL	YES	NONE	NO	
3	COMPFLAKE	CORTICAL	YES	NONE	NO	
4	COMPFLAKE	CORTICAL	YES	NONE	NO	
5	COMPFLAKE	CORTICAL	YES	NONE	NO	
6	COMPFLAKE	CORTICAL	YES	NONE	NO	
7	COMPFLAKE	CORTICAL	YES	NONE	NO	
8	COMPFLAKE	CORTICAL	YES	NONE	NO	
9	COMPFLAKE	CORTICAL	YES	NONE	NO	
10	COMPFLAKE	CORTICAL	YES	NONE	NO	
11	COMPFLAKE	CORTICAL	YES	NONE	NO	
12	CORE					
13	CORE					
14	COREFRAG					
15	COREFRAG					
16	DEBRIS					
17	DEBRIS					
18	DEBRIS					
19	DEBRIS					
20	DEBRIS					
21	DEBRIS					
22	DEBRIS					
23	DEBRIS					
24	DEBRIS					
25	DEBRIS					
26	DEBRIS					
27	DEBRIS					
28	DEBRIS					
29	DEBRIS					
30	DEBRIS					
31	DEBRIS					
32	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
33	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
34	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
35	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
36	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
37	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
38	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
39	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
40	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
41	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
42	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
43	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
44	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
45	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
46	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
47	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
48	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM

	A	B	C	D	E	F
49	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
50	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
51	PROXFLAKE	CORTICAL	YES	NONE	NO	TRIM
52						
53						
54						
55	**Artifact**	**Total**	**Average**			
56	**BIFACE**	**0**	**0.000**			
57	**COREFRAG**	**10**	**0.019**			
58	**CORE**	**2**	**0.004**			
59	**PROXFLAKE**	**20**	**0.038**			
60	**COMPFLAKI**	**2**	**0.004**			
61	**COMPTOOL**	**0**	**0.000**			
62	**DEBRIS**	**16**	**0.030**			
63		**50**				

	G	H	I	J	K	L	M
1	MATERIAL	SURFACE	LEVEL	% CORTEX	COLOR	TERM. TYPE.	BORDIAN
2	OBSIDIAN	YES	SURFACE	2	BLACK	NORMAL	
3	OBSIDIAN	YES	SURFACE	2	BLACK	NORMAL	
4	OBSIDIAN	YES	SURFACE	3	BLACK	NORMAL	
5	OBSIDIAN	YES	SURFACE	3	BLACK	HINGE	
6	OBSIDIAN	YES	SURFACE	3	BLACK	HINGE	
7	OBSIDIAN	YES	SURFACE	3	BLACK	OVERSHOT	
8	OBSIDIAN	YES	SURFACE	4	BLACK	NORMAL	
9	OBSIDIAN	YES	SURFACE	4	BLACK	OVERSHOT	
10	OBSIDIAN	YES	SURFACE	4	BLACK	NORMAL	
11	OBSIDIAN	YES	SURFACE	4	BLACK	NORMAL	
12	OBSIDIAN	YES	SURFACE	2	BLACK		
13	OBSIDIAN	YES	SURFACE	2	BLACK		
14	OBSIDIAN	YES	SURFACE	4	BLACK		
15	OBSIDIAN	YES	SURFACE	4	BLACK		
16	OBSIDIAN	YES	SURFACE	1	BLACK		
17	OBSIDIAN	YES	SURFACE	1	BLACK		
18	OBSIDIAN	YES	SURFACE	1	BLACK		
19	OBSIDIAN	YES	SURFACE	1	BLACK		
20	OBSIDIAN	YES	SURFACE	1	BLACK		
21	OBSIDIAN	YES	SURFACE	1	BLACK		
22	OBSIDIAN	YES	SURFACE	1	BLACK		
23	OBSIDIAN	YES	SURFACE	2	BLACK		
24	OBSIDIAN	YES	SURFACE	2	BLACK		
25	OBSIDIAN	YES	SURFACE	2	BLACK		
26	OBSIDIAN	YES	SURFACE	2	BLACK		
27	OBSIDIAN	YES	SURFACE	2	BLACK		
28	OBSIDIAN	YES	SURFACE	2	BLACK		
29	OBSIDIAN	YES	SURFACE	3	BLACK		
30	OBSIDIAN	YES	SURFACE	3	BLACK		
31	OBSIDIAN	YES	SURFACE	3	BLACK		
32	OBSIDIAN	YES	SURFACE	1	BLACK		
33	OBSIDIAN	YES	SURFACE	1	BLACK		
34	OBSIDIAN	YES	SURFACE	1	BLACK		
35	OBSIDIAN	YES	SURFACE	1	BLACK		
36	OBSIDIAN	YES	SURFACE	1	BLACK		
37	OBSIDIAN	YES	SURFACE	2	BLACK		
38	OBSIDIAN	YES	SURFACE	2	BLACK		
39	OBSIDIAN	YES	SURFACE	2	BLACK		
40	OBSIDIAN	YES	SURFACE	2	BLACK		
41	OBSIDIAN	YES	SURFACE	2	BLACK		
42	OBSIDIAN	YES	SURFACE	2	BLACK		
43	OBSIDIAN	YES	SURFACE	3	BLACK		
44	OBSIDIAN	YES	SURFACE	3	BLACK		
45	OBSIDIAN	YES	SURFACE	3	BLACK		
46	OBSIDIAN	YES	SURFACE	3	BLACK		
47	OBSIDIAN	YES	SURFACE	3	BLACK		
48	OBSIDIAN	YES	SURFACE	3	BLACK		

	G	H	I	J	K	L	M
49	OBSIDIAN	YES	SURFACE	3	BLACK		
50	OBSIDIAN	YES	SURFACE	4	BLACK		
51	OBSIDIAN	YES	SURFACE	4	BLACK		
52					**TOTAL**		
53					**AVERAGE**		
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							

	N	O	P	Q	R	S
1	#RET.EDGE	RET.INTENS.	F. LENGTH	F. WIDTH	F. THICKNSS	PLAT.THICK.
2	0		7.8	5.62	1.29	0.92
3	0		10.5	5.07	1.93	1.27
4	0		9.25	8.5	2.33	1.88
5	0		11.28	6.18	3.81	0.93
6	0		8.48	7.18	1.36	0.94
7	0		8.87	5.54	2.24	1.23
8	0		10.94	6.93	2.17	1.07
9	0		8.89	10.51	1.99	1.55
10	0		6.69	3.85	1.54	0.68
11	0		10.25	6.53	3	1.1
12	0		7.35	5.82	5.5	5.5
13	0		8.53	7.34	6.87	6.87
14	0		12.53	8.15	4.51	2.96
15	0		9.2	6.08	3.58	1.91
16	0		3.25	1.61	0.97	0
17	0		4.46	1.31	1.07	0
18	0		2.83	1.99	0.54	0
19	0		4.26	2	0.62	0
20	0		3.61	1.99	0.44	0
21	0		2.88	2.47	0.42	0
22	0		3.4	1.72	0.3	0
23	0		9.04	5.18	2.77	0
24	0		6.06	5.2	1.01	0
25	0		4.47	3.73	0.64	0
26	0		4.46	2.4	0.98	0
27	0		2.94	3.03	1.08	0
28	0		3.84	2.56	0.83	0
29	0		4.37	3.46	0.93	0
30	0		3.67	1.56	0.89	0
31	0		3.5	2.01	0.44	0
32	0		5.15	5.46	1.19	0.71
33	0		4.28	6.83	0.7	0.32
34	0		4.74	4.85	0.78	0.5
35	0		3.83	1.48	0.62	0.22
36	0		2.86	2.28	0.56	0.24
37	0		8.58	6.76	2.49	0.81
38	0		5.3	1.36	0.46	0.39
39	0		2.71	3.31	0.95	0.87
40	0		4.04	3.55	0.51	0.37
41	0		3.51	1.9	0.44	0.2
42	0		2.23	1.93	0.45	0.21
43	0		8.1	5.77	2.24	1.8
44	0		7.35	8.26	1.9	1.28
45	0		8.72	6.71	1.62	1.34
46	0		4.37	7.09	0.79	0.16
47	0		6.09	3.76	2.7	1.79
48	0		5.11	3.46	1.15	0.59

	N	O	P	Q	R	S
49	0		1.77	3.112	0.52	0.12
50	0		3.87	4.78	0.99	0.95
51	0		4.05	4.37	0.93	0.58
52	**0**		**294.26**	**222.542**	**78.04**	**42.26**
53	**0.000**		**5.885**	**4.451**	**1.561**	**0.845**
54						
55			**COLOR**	**TOTAL**	**AVERAGE**	**% CORTEX**
56			**BLACK**	**50**	**0.094**	**O%**
57			**RED/BLAC**	**0**	**0.000**	**0-10%**
58				**50**		**10-40%**
59						**40-60%**
60						**60-90%**
61						**90-100%**
62						
63						

	T	U
1	PLAT.WIDTH	FRAGMENT
2	3.3	0
3	3.18	0
4	6.23	0
5	1.99	0
6	2.62	0
7	1.91	0
8	2.83	0
9	1.93	0
10	1.76	0
11	3.05	0
12	6.96	0
13	6.87	0
14	2.91	0
15	1.63	0
16	0	3
17	0	4
18	0	3
19	0	4
20	0	3
21	0	3
22	0	3
23	0	6
24	0	4
25	0	4
26	0	4
27	0	3
28	0	3
29	0	4
30	0	3
31	0	3
32	2.16	4
33	1.33	4
34	2.51	4
35	0.68	3
36	0.55	3
37	2.41	6
38	0.54	4
39	2.25	3
40	1.51	4
41	0.21	3
42	0.49	3
43	3.98	6
44	2.56	5
45	3.57	6
46	3.6	4
47	3.42	4
48	1.44	4

	T	U
49	0.81	2
50	2.13	4
51	1.82	3
52	**85.14**	**136**
53	**1.703**	**2.720**
54		
55	**TOTAL**	**AVERAGE**
56	**12**	**0.023**
57	**16**	**0.030**
58	**14**	**0.026**
59	**8**	**0.015**
60	**0**	**0.000**
61	**0**	**0.000**
62	**50**	
63		