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Novicehood: Exploring skill level and how it relates to Mass Analysis

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An Honors Thesis submitted in partial fulfillment of the requirements for Honors in the Department of Sociology and Anthropology

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ABSTRACT

Lithic artifacts are among the most common remnants evidencing our ancestors' intelligence and survivability. They can reflect many aspects of a culture's practices and use of natural materials. The analysis of such remains is a mainstay of archaeology, but not all lithic analysis is the same. Analysis varies by method (mass flake analysis, individual flake analysis, etc.), and by the level of experience of the analysts themselves, creating debate on the comparability and the accuracy of each approach. This research is a case study of my effectiveness, being a novice level archaeologist, at Mass Flake analysis, using a contemporary collection of lithic debris. Effectiveness will be measured using the creator of the debris, who is an expert stone knapper (Scott Jones), as the final reviewer of materials identified and discussed. This study hopes to shed light on not only the method used, but how much the experience of the analyst comes into play.

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Introduction

Archaeologists study how people in the past have lived and interacted with each other and with their environments around them. This can show us how we have either changed or possibly have not changed over time. Archaeology can show us how the environments including flora and fauna have changed over time as well. These changes over time are typically interpreted through the evidence of past human occupation. Most often what is left behind from human occupation and manages to endure time are stone and pottery/ceramic artifacts. This fact accounts for a plethora of archaeological research being based on lithic studies.

Lithic analysis, the way in which we study these lithic materials/artifacts, can be accomplished using a multitude of methodologies. These include individual flake analysis, mass (aggregate) analysis, artifact re-fitment, micro-wear analysis, crossover immunoelectrophoresis (analyzing plant and animal proteins found on some lithics), as well as other methods. They all aim to glean as much information as possible from every aspect of lithic material. It can take a range of experienced and inexperienced analysts/archaeologists, from CRM (Cultural Resource Management) professionals to dedicated researchers in the field of archaeology, to accomplish these analyses due to some being more complicated and demanding than others.

This multitude of methods and the varying degree of training which each method requires can lead to many good findings. They, however, may also cause the results and findings to vary from each other in sometimes contradictory ways.

Research Problem

Mass or aggregate analysis as a term was first coined by Stanley Ahler in 1972 (Ahler 1989). He used it to describe a method that focused more on what the flake debris in a collection

means as a whole; this was in contrast to individual flake analysis which requires a much more significant amount of time to perform due to its minute analytic nature. Mass analysis is simpler and faster to use while also eliminating an analyst's subjectivity in artifact identification. Mass analysis is suited for collections and samples that contain large numbers of artifacts. This method first involves sorting the material through different size grade screens, after which the lithics in each screen are sorted by material type and artifact type, then counted and weighed. A sample from each screen aggregate is then analyzed for quantitative data. Mass analysis doesn't require as in depth specialized training as some other methods, making it popular with many professionals in archaeology.

My research question is: how accurate does a novice level analyst perform the screening, sorting and classification aspect of a mass analysis? Researchers and analysts (e.g. Andresfky, 2007, Bradbury and Carr 2009) have largely agreed that this area needs more work. The level of accuracy and reliability of analyses has come into question in cases where novitiate analysts are doing the analysis. This is the case in particular when sorting and cataloging are accomplished by inexperienced lab analysts (Bradbury and Carr 2009, Bradbury and Carr 2000, Andrefsky 2007). This study attempts to measure the accuracy of a novitiate mass analysis.

Background Literature

Although mass analysis is widely used, it also may have shortcomings. For instance, ones in particular with mass analysis include the idea of debitage mixing (Andrefsky Jr. 2007, Bradbury and Carr 2009). This is the idea that when just analyzing a small sample from different screens, an analyst might not get a full picture of what all was mixed in with that sample. Then there are issues with analysis as a whole and the different factors of variability

when a novice performs the analysis. These are the issues my research struggles with using steps in particular with mass analysis.

The first issue stated by many researchers deals with experience level. A major component to this idea is that few if any universities afford students a chance to accomplish their own lithic analysis (Rosen and Clark 1996). Training in lithic analysis in general can be minimal in many cases, resulting from either not having classes solely focused on this or only offering these classes on an irregular basis (Bradbury and Carr 2009). For many archaeologists their first experience with doing their own unsupervised analysis is with CRM after they graduate with their bachelor's. This in turn puts lithic analysis in the hands of possibly inexperienced archaeologists (Bradbury and Carr 2000). This also means much training is done by CRM professionals, in cases where there is supervision (Lepongeon 2017). This creates many schools of analysis and creates more analyst variability and possibly error at least due to incompatible results. Experience level is a major issue as well as proper experience when completing an analysis of lithics in general.

Another common issue involves the variability of raw material and how this variety can influence the analyst. First off it has been noted that different material types can have varying levels of difficulty when being analyzed (Profitt and De La Torre 2014). In many cases certain raw materials can influence an analyst's objectivity. For instance, in the case of broken in half quartz cobbles, they can lead an analyst prematurely to suggest bipolar reduction when that is not the case (Bradbury and Carr 2009). Also, specific raw materials can be difficult to identify in sub groups. This material can be quite difficult to identify sources from which it came, due to its wide variety in colors and textures (Anglen and Hoard 2003). Finally, another issue is that the initial size and shape of the core or blank of specific materials can influence how they are knapped and therefore

analyzed. This, however, is more of an issue when creating experimental assemblages to compare to field sites (Andrefsky Jr 2007).

The final issue that pertains to my research is the idea of analytical conservatism. This is the idea that analysts of any experience level can either consciously or subconsciously identify pieces of debitage in a conservative manner. This can result in an analyst avoiding in-depth analysis of a collection, limiting what can be interpreted from it. This can be common in research and CRM lithic analysis to lessen the chance for error in their assessment. In these cases, the analyst may not measure or count certain characteristics of debitage due to their uncertainty (Profitt and De La Torre 2014).

Author's Prior Training

A main point to this research is my experience level and what exactly constitutes a novice analyst. I did not go into this experiment completely unknowing of analysis methods, raw material types, or typological classifications such as some flake types and tools. I had learned of them from classes and informal conversations with professors and mentors, but had no actual unguided lab experience in identifying these variables on my own. Also adding to my lithic knowledge was the general lithic analysis research I had done to get an understanding of my research question. In the realm of classes, the only ones I had that pertained to this field was a material culture class and a primitive technology class as well as a field school. That is to point out why I consider myself a novice in the field of lithic analysis.

To go into better detail of the classes I will describe the courses briefly to explain the scope of my knowledge. Material Culture was primarily focused on the southeastern United States, and over the course we studied and were quizzed on prehistoric lithics, prehistoric pottery, and historic ceramics. In the Lithics section we covered the Paleoindian, Archaic,

Woodland, and Mississippian cultural/chronological periods. The various tool and pp/k types of these periods were taught and we went over lithic reduction as a topic as well as covered commonly found raw material types in the Southeast. In the primitive technology class we recreated fire bows, cordage, atlatls, low-fired pottery, making gourd containers, as well as having an entire day for lithic reduction. On that day we were shown bipolar lithic reduction and pressure flaking techniques to see what material is left behind and made from these methods. These courses both were extremely information dense in all aspects that were studied and were taught either one day or two days a week. I mention this to show that this classes moved at a fast pace and their goal of understanding were not only lithics related. Field School was a summer course that lasted five weeks and was held on Monday through Friday. This course was an all-day course that took us to a field site and we were taught the practices and methods of field work. Two days were allotted in this course for lab work, on which we cleaned all items that were bagged from shovel test sites, then we sorted the materials from the shovel test sites into categories of organic and man-made.

The informal discussions that were had between Dr. Wood (Assistant Professor of Anthropology at Georgia Southern University), the research advisor for this project and the teacher of the prior mentioned courses, and Scott Jones (Archaeologist and primitive technology specialist) were also extremely informative for my understanding of lithics. Jones, as a mentor to me in lithic reduction and geologic materials, has helped me understand most of how a lithic analysis should be done. He was also the person who taught the lithic reduction or knapping section during the primitive technology class. They taught me a wide array of materials that were found in the Southeast as well as some materials from elsewhere. I was given CRM lithic analysis forms by Jones to show me how I could formulate my categories during analysis. The forms gave me a better idea of how to go about the analysis in general. These discussions as well

as the classes and the general lithic research I did enabled me as a novice level analyst to begin my experiment.

Case Study

This research being experimental in nature meant I had to understand what experimental archaeology is and aims to accomplish. Experimental Archaeology is research and studies done that either try to replicate the conditions on a site to understand how it was created, or taking known methodologies and testing them out in different ways to try and improve the analysis and understanding of artifact collections. This subfield of archaeology has been booming to the effect that much research has been done to better the way in which we practice archaeology. I used principles in the subfield, such as using experimental lithic collections and testing of methods, to guide me along and create the scenario for my analysis. With the encouragement of Jones and Dr. Wood I developed a blind lithic analysis test for a known collection of lithic debitage. The next step was how to best gather a known collection, or a collection with a true value. That is to say an assemblage that I could compare my results to and judge on the accuracy of my results with a true value (Profitt and De La Torre 2014).

Sample

The decision was made to use a sample of modern debitage knapped by Jones. This was done so we could have a true value of the debitage when he grades my analysis. He would have known what he knapped with as well as how he knapped it. Dr. Wood and I traveled to meet with Jones at his outdoor teaching facility for primitive technologies in Oglethorpe County, Georgia on July 10, 2016. This was to obtain my debitage sample. When we got there Jones toured us around his debitage piles while explaining that these have accrued over recent years of him teaching how to knap as well as non-teaching knapping.

To obtain the sample from the various piles I used, along with Jones, a shovel, a hand

rake, a bucket, and a ¼ inch screen. A random sample was taken from multiple debitage piles using the shovel and was then screened. Figure 1 shows the collection process.

Figure 1. Field collection

This was done to emulate the same techniques practiced in field research and CRM. We gathered 7.5 kgs of lithic debitage and decided that was a large enough sample to use. Afterwards Jones took me around and introduced me to the various materials he uses for knapping. We agreed that this would help acquaint me with the materials he used, since some weren't actually from the Southeast. I also was shown some tool types I was not familiar with such as a burin. This was to give me an idea of some of the specialized pieces I might encounter.

Methods

Once back in the lab with the debitage collection they were immediately washed. This was done to remove all dirt and organic matter from the materials to start the analysis. The debitage was then re-screened through 1, ½, and ¼ inch screens to size grade them. These size screens were used to simulate typical sizes used in research purposes (Ahler 1989). All debitage was hand manipulated during the screening process, this means any material that wasn't sifted through from shaking was manipulated by hand to see if it would fall through in any direction. When the size grading was finished, the next step was to identify material types. All analysis was

performed under standard fluorescent ceiling lights on colored trays lined with white paper. This was to allow for contrast to be seen more easily. When the material types were classified and sorted, I then moved on to assigning the materials into typology classifications based on artifact types.

The debitage was put into their groupings based on raw material, size, and artifact classification, and then bagged. The bags were then labeled with the all of their appropriate cataloging information (raw material type, size, and artifact type). After that I counted each piece of debitage in the bags and weighed them to gather my quantitative data; this information was added onto the bag labels as well. A spreadsheet was then created to catalog each bag with the weight and count values associated with it. This spreadsheet was used to create Table 1 based on material and size as well as artifact classification. The creation of this table was the last step in my experiment.

After the analysis was completed all materials were displayed in the Archaeological Research Laboratory of the Georgia Southern University Department of Sociology and Anthropology department. They were displayed and spaced out from each other so every category was separate. This was done so Jones could come down and basically grade my analysis and see how accurate I was. He checked each grouping individually and where there were groupings larger than 50 pieces of debitage, he examined a sample of 50. He took out any mistakes in debitage classifications I had made and made corrections as to what they really were. Finally, with the corrections he made I was able to compare my spreadsheet of classifications and findings to one with his corrections and obtain an accuracy rating. This accuracy rating was what we used to determine my ability as a novice archaeologist or lithic analyst to perform an accurate mass analysis.

Material Types

There were 21 types of raw materials that were found in this experiment. They varied in diversity of materials used in prehistoric lithic reduction to materials that have only been created recently in history. There are two categories that don't have a definition, this is because they were unidentified. The only difference between them is one group was clearly thermally altered. Heat treatment is performed to try and increase the quality of the starting material. All of the definitions except for the cherts came from https://www.mindat.org/ (Mindat 2017). The chert definitions came from the informal discussions with Jones, Dr. Wood, and myself.

Amphibolite

This material is a granofelsic metamorphic rock. It is typically found in colors ranging from green, brown, and black. Figure 2 shows an example of dark gray amphibolite with some reddish oxidation from the experimental collection.

Figure 2. Dark Gray Amphibolite

Ceramic

This material is modern and man made from white clays. Some of it appears to be from a

toilet judging by the paste. It is easily distinguishable due to it having a paste visible where it is broken or cracked. It can be of any color. This material is not lithic material. Figure 3 shows some pieces of white ceramic debitage with the paste

Figure 3. White Ceramic debitage

Coastal Plain Non Heat Treated Chert (shortened as CP-NHT chert)

Chert in general is a dense, hard siliceous, and tough sedimentary rock with low porosity. It is composed of microcrystalline quartz and varying amounts of impurities. The Coastal Plain variant is extremely variable. It can range from high quality to poor quality. Also it can be found in most colors; in my collection I had purples, reds, browns, tans, whites, some greenish and reddish pieces, as well as some blacks, yellowish, and pinks. The pieces of chert with purple coloring on the collection of chert was a rare material from Jasper County, Georgia; purple isn't a common color for Southeastern Coastal Plain chert. One red flag characteristic of Coastal Plain chert is the presence of inclusions such as quartz crystals and sea shells, this is usually found in the medium to poor quality samples. The material is usually dull and can be either smooth or

rough. This depends on the quality of it. The Coastal Plain is defined as the large area of low-lying land beside the sea bed. Most of this land at one point in history was under water. This land being underwater led to many of the minerals forming sedimentary rocks such as chert with many inclusions like sea shells. This is why some Coastal Plain chert is of poor quality. Figure 4 and Figure 5 show some of the color variation while being able to also see some inclusions. Figure 5 depicts the rare purple Jasper County material.

Figure 4. Coastal Plain Chert Non-heat Treated Chert

Figure 5. Jasper County Coastal Plain-Non Heat Treated chert

Coastal Plain Heat Treated Chert (shortened as CP-HT chert)

Chert in general is a dense, hard siliceous, and tough sedimentary rock with low porosity. It is composed of microcrystalline quartz and varying amounts of impurities. This is the same as the non-heat treated with the exception of being thermally altered. This usually adds tinges of bright pink, red, and purple to the materials and can change the texture in making it smoother to the touch. Figure 6 and Figure 7 show some of the varying colors of Coastal Plain heat treated chert

Figure 6. Coastal Plain Heat Treated Chert.

Figure 7. Coastal Plain Heat Treated Chert

Dacite

This is a fine-grained crystalline igneous rock. This material is typically grey or pale brown with mixtures of yellow and black. Figure 8 and Figure 9 Show the typical gray color with Figure 9 showing some of the yellowish color.

Figure 8. Dark Gray Dacite

Figure 9. Dark Gray with yellowish cortex

Diabase

This material, also known as dolerite, is a medium grained igneous rock. It is typically darker in colors, ranging from black to gray. They can have some reddish, greenish, and yellowish mixtures as well. Figure 10 shows an example having typical colors.

Figure 10. Diabase dark gray with yellow-greenish mixture

Diorite

Diorite is a coarse grained crystalline igneous rock. It is dark grey to black in color, it can also be speckled with white and black as well. It can have a yellowish cortex/oxidation depending on varying mineral content. Figure 11 shows an example of Diorite with cortex oxidation.

Figure 11. Gray Diorite with some yellowish cortex.

Gneiss

This material is a medium to high grade metamorphic rock that can be medium to coarse grained. It can be banded and therefore can have a flaky texture and display foliation. Color can vary, but generally it alternates by layer light colors to dark colors. This ranges from white to black as well as grays. It can be speckled and may have varying cortex and oxidation based on mineral content. Figure 12 shows an example of the speckled variety.

Figure 12. Speckled gray Diorite.

Modern Glass

This material is modern and man made from sand or silica by being heated to extreme temperatures to create a melting mixture that when cooled becomes a non-crystalline solid. It can range in colors due to it being man made as well. This material is not lithic. Figure 13 demonstrates a variety of Modern Glass.

Figure 13. Glass of varying colors.

Novaculite Non Heat Treated

This material is a uniformly fine-grained hard rock composed of fine-grained to cryptocrystalline quartz. The colors can range from white, gray, or black due to impurities. It has a waxy or dull luster. It is a variety of chert. Figure 14 shows high quality Novaculite in typical colors

Figure 14. Bright white and dull white Novaculite

Novaculite Heat Treated

This material is similar to the Novaculite non heat treated, but it is thermally altered. This also changes the color profile to include reds and tinges of red. Figure 15 shows the trade mark pink tinge all over a piece of Novaculite that has been heat treated.

Figure 15. Heat Treated Novaculite

Obsidian

This material is a glassy igneous rock. It is formed from cryptocrystalline grains of silica minerals in a glass-like suspension. Its broken edges are extremely sharp. Its colors can range from black to bluish, mahogany, golden, red, and green and largely depends on the refraction of the comprised silicates. Figure 16 shows some colors of obsidian.

Figure 16. Various colors of obsidian

Quartz

This term was used for macro-crystalline quartz. It is made of visible crystals or grains. Quartz, due to being able to form with many different minerals and varying mineral amounts, can be found in many colors. Quartz is a very hard material and scratches glass. It typically has a glassy luster. Figure 17 shows some typical coloration of Quartz.

Figure 17. Quartz

Quartzite

This material is a hard metamorphic rock that used to be quartz. Through geologic pressures it is changed into a hard grainy material. The colors range from white, tan, and gray with possible shades of pink and red. Figure 18 shows some colors of Quartzite.

Figure 18. Quartzite

Red Brick Material

This is a modern man made material, which seemed to be made from a hard fired clay material. This was found to be red drain tile, so it was made from clay and other particulates being fired. It has some inclusions. This material is not lithic. Figure 19 shows an example of this material with inclusions.

Figure 19. Red brick Material with inclusions

Rhyolite

This material is a very hard, fine-grained crystalline igneous rock. Its colors typically range from white, gray, greenish gray, reddish, to black. Figure 20 shows some of the various colors in which Rhyolite is available.

Figure 20. Rhyolite

Ridge and Valley Chert

Chert in general is a dense, hard siliceous, and tough sedimentary rock with low porosity. It is composed of microcrystalline quartz and varying amounts of impurities. The Ridge and Valley variant is typically of higher quality material than Coastal Plain chert. This makes it very smooth to the touch. It also does not have very many inclusions. The colors range from white, brown, gray, tan, black, and virtually every shade of these colors. It can be spotted as well. This chert was formed under circumstances that created what is known as the Ridge and Valley physiographic province of Georgia. It was created when strata was folded to the west and was forced over massive faults. Most of the rocks in this region are sedimentary due to little metamorphism. The rivers in this region have been cutting into the valleys allowing for collection of this chert since the beginning of habitation for this region. Figure 21 shows a typical cobble of Ridge and Valley Chert with its colors and patterning.

Figure 21. Ridge and Valley Chert

Soapstone

Soapstone, also known as steatite, is a very soft metamorphic rock. This is due to its high talc content and is easily cut or carved with tools. It is typically white, yellowish, greenish, greenish-brown, reddish, brown, and gray. Figure 22 shows an example of Soapstone.

Figure 22. Soapstone

Unidentified Non Heat Treated

This material was a small collection of raw material that was unable to be identified. The color and characteristics varied for this category. Figure 23 shows the range of unidentified materials I had.

Figure 23. Unidentified material

Unidentified Heat Treated

This material was a small collection of more raw material that could not be identified. It was noted, however, that this material was heat treated due to its pink discoloration. Figure 24 shows an example ofthe unidentified material with the pink tinges of heat treatment.

Figure 24. Unidentified Heat Treated material

West Texas Chert

Chert in general is a dense, hard siliceous, and tough sedimentary rock with low porosity. It is composed of microcrystalline quartz and varying amounts of impurities. The west Texas variety typically has fewer to no inclusions such as sea shells. It is of a higher grade quality than some Coastal Plain chert and therefore is smoother. Its colors range from browns, tans, whites, grays and dark grays. This material is known as Georgetown Chert and was collected from the Edwards Plateau region in central Texas. Figure 25 shows some typical coloration of West Texas Chert while showing cortex as well.

Figure 25. West Texas Chert

Typological Categories

In total there were 21 typological categories that were used. These categories used are very broad in many contexts. I tried to use general/broad terms in cases where I could to eliminate subjectivity as much as possible, as well using established terminology. In cases where unique identifiers were present, as is the case with the burin and prismatic blade core, I did categorize them as specifically as possible. This could be helpful in understanding what technology was being produced if this were an actual site's debitage collection.

Amorphous Rock

This category entails materials that did not show any evidence of human modification. It is typically odd and blocky in shape. Figure 26 shows examples of Amorphous Rocks in Coastal Plain-Non Heat Treated chert.

Figure 26. Amorphous Rocks

Biface

A Biface is lithic material that is alternately flaked on two sides or surfaces. Figure 27 shows an example of a Biface in Quartzite.

Figure 27. Biface

Biface Core Fragment

These are cores that were clearly being set up for some kind of biface production. These materials were either broken or fragmented before completion. Figure 28 shows an example of Biface Core Fragments in CP-NHT Chert.

Figure 28. Biface Core Fragments

Biface Thinning Flakes

This category is comprised of flakes that are knocked off the edges of the biface/biface preform in order to make it thinner. These flakes are usually curved in cross section longitudinally, this is because they have been knocked off of a curved surface (Yohe II 1998, 58). Figure 29 shows examples of Biface Thinning Flakes in CP-NHT chert.

Figure 29. Biface Thinning Flakes

Bipolar Cores

This category had very few pieces in it. This is due to the destructive nature of bipolar reduction, where the core is most often destroyed or broken apart and leaves fragments. There were some cores that only some pieces had been knocked off, while still retaining most of their mass and leaving the indention scars from this technique on the core. Figure 30 shows an example of a Bipolar Core with its typical bipolar scarring in Quartzite.

Figure 30. Bipolar Core

Bipolar Reduction Material

This category contains material that is cracked or broken off of a core in bipolar reduction. Most bipolar reduction occurs on quartz cobbles due to their internal structuring and their small size; this is one of the only effective methods of knapping such material. It is typically rounded in nature and can be a half or portion of a nodule or cobble. It could be considered shatter in some cases. Figure 31 shows examples of Bipolar Reduction Material in Quartzite.

Figure 31. Bipolar Reduction Material

Broken Biface

This category is comprised of bifaces that were in the process of finishing or possibly were finished, but were fractured or broken. Figure 31 shows examples of Broken Bifaces in Quartz.

Figure 32. Broken Bifaces

Broken Prismatic Core

This category was unique enough to individually analyze by itself from other broken cores/core fragments. It very clearly shows evidence of obsidian prism blades being knocked off. This is a very common way to knap obsidian and shows unique signatures. It is an obsidian nodule that is set up in a round shape with one end being flat or somewhat flat while the opposite end is more rounded. The blades are knapped in a circular pattern from the flat end to the rounded end. Figure 33 shows an example of a Broken Prismatic Core made out of Obsidian.

Figure 33. Broken Prismatic Core

Broken Tool

This category contains the same pieces that would have been included in the category known as tools. The separation of the categories is because these pieces were broken or fragmented. This could be from many reasons. Figure 34 shows an example of a Broken Tool made out of Rhyolite.

Figure 34. Broken Tool

Burin

This category encompasses a unique tool that is easily identifiable due to it being made in a specific fashion. It is a chisel or engraver; the feature that makes them identifiable is known as a burin spall. In order to make them a knapper takes a flake and knaps it obliquely on the edge of the flake to create the chisel or engraving point (Scott Jones, Personal Communication, 2016). Figure 35 shows examples of Burins made out of CP-NHT Chert.

Figure 35. Burin

Core

This category houses lithics from which flakes are removed. These artifacts are typically larger in size and usually show signs of planned knapping. There can be many different types of cores, i.e. bifacial, bipolar or directional (Sutton and Arkush 1998, 48). Figure 36 shows examples of Cores made out of CP-NHT Chert.

Figure 36. Cores

Core Fragment

This categories contains the same lithics as cores, but only in broken or fragmented states. Figure 37 shows examples of Core Fragments made out of CP-NHT Chert.

Figure 37. Core Fragments

Heated Shatter

This category is similar to shatter, but this shatter occurs from the thermal altering process when heat treating materials. This means it is not attributed to the knapping process. Pot lid fracturing is an example of this, in which impurities within the stone explode from heating and shoot shards of material out. This will leave crater like depressions on the stone. Figure 38 shows an example of Heated Shatter made out of CP-HT Chert.

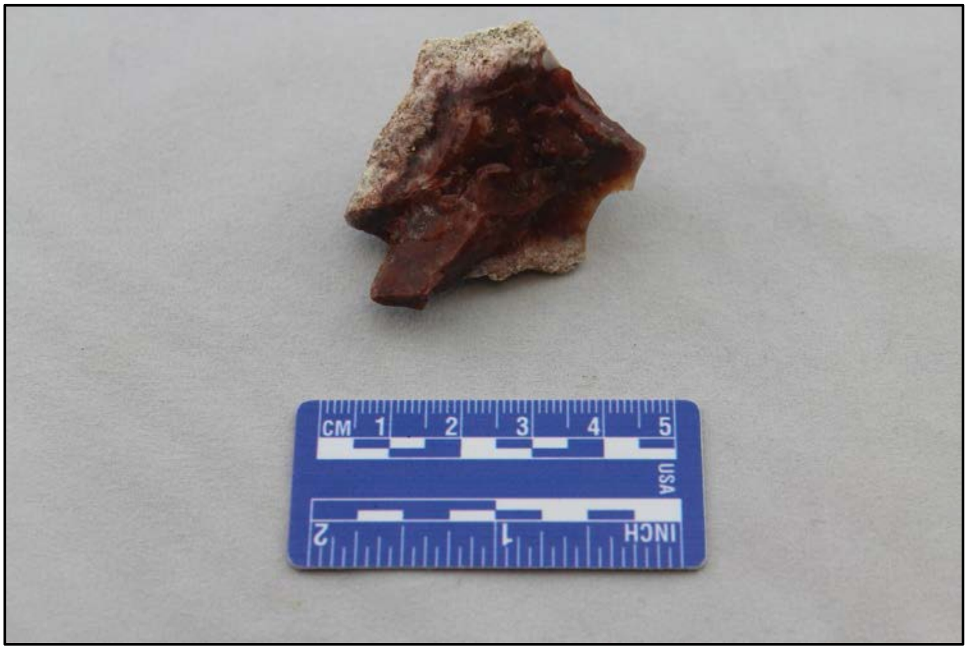

Figure 38. Heated Shatter

Primary Flakes

This category houses flakes that have at least one side covered in cortex. This indicates early stage lithic reduction (Dr. M. Jared Wood, Personal Communication, 2015). Figure 39 shows examples of Primary Flakes made out of R&V Chert.

Figure 39. Primary Flakes

Projectile point/Knife (PP/K)

This category contains only one lithic piece, but it is the only finished and complete PP/K that was oddly found in the debitage collection. It is a small Savannah River type point made out of Coastal Plain non heat treated chert, shown in Figure 40.

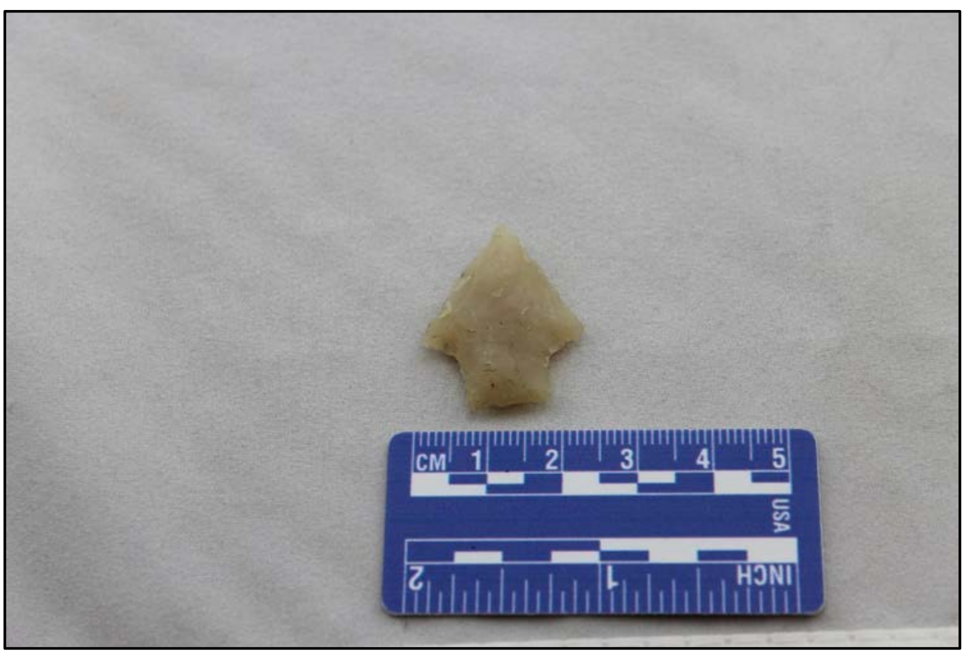

Figure 40. PP/K Savannah River type

Secondary Flakes

This category houses flakes that have any amount of cortex that is less than one whole side of the flake covered. Figure 41 shows examples of Secondary Flakes made out of R&V Chert.

Figure 41. Secondary Flakes

Shatter

This category contains all angular and blocky waste from knapping. Usually these materials are not diagnostic. Figure 42 shows an example of Shatter made out of CP-NHT Chert.

Figure 42. Shatter

Tertiary Flakes

This category has flakes that have no cortex on them, indicating late-stage reduction.

Figure 43 shows examples of Tertiary Flakes made out of obsidian.

Figure 43. Tertiary Flakes

Tool

This category is one which I assigned pieces to if there was preparation done on the lithic piece to actively make a tool out of it. This included pieces that were suspected of being drills/awls, saws, or other specific use tools. Not included in this are the PP/K and the burin spalls due to the exact identification of those materials, whereas tool was more of a broad category. Figure 44 shows an example of a Tool made out of CP-NHT Chert.

Figure 44. Tool

Utilized Flakes

This category includes flakes that have been used as tools. In many instances during the knapping process flakes are knocked off and these flakes are used as scrapers and other opportunity tools. These utilized flakes can be intentionally or unintentionally created. Most

often these flakes show evidence of use wear and that is diagnostic of this category. Figure 45 shows an example of a Utilized Flake with edge wear made out of Novaculite-NHT.

Figure 45. Utilized Flake

Results

The results of my research are split into two categories. The first is my results. The second includes Jones' corrections. These are followed by a description of the differences between the two. I have made a table showing the material types as well as size and the typological categories for my results (Table 1, see end of My Results section) and one after Jones' corrections (Table 2, see end of Jones' Corrections section). The pieces of debitage are input in the tables as a count and weight set, shown as (count/weight). The weight is measured in grams, because that is the typical unit of measurement for weight in archaeology.

My Results

The descriptions of my analysis of material types are, shown in Table 1, as follows.

The Ceramic materials numbered in 47 pieces of debitage weighing 44.6 grams. This was sorted as: ½ Inch Core Fragments (1/10.8g), ½ Inch Secondary Flakes (3/4.3g), ½ Inch

Tertiary Flakes (4/11.9g), ¼ Inch Secondary Flakes (12/6.2g), ¼ Inch Shatter (11/6.2g), ¼ Inch Tertiary Flakes (16/5.2g).

The Coastal Plain-Non Heat Treated Chert (CP-NHT) materials numbered in 2134 pieces of debitage weighing 3847.34 grams. This was sorted as: 1 Inch Amorphous Rock (1/44.6g), 1 Inch Broken Bifaces (2/146.5g), 1 Inch Broken Unifaces (1/20.3g), 1 Inch Cores (6/1007.6g), 1 Inch Core Fragments (26/799.6g), 1 Inch Primary Flakes (3/77.4g), 1 Inch Secondary Flakes (4/53.1g), 1 Inch Tertiary Flakes (2/27.4g), 1 Inch Unifaces (1/16.2g), ½ Inch PP/K (1/3g), ½ Inch Primary Flakes (27/127g), ½ Inch Secondary Flakes (132/391.7g), ½ Inch Shatter (41/146.1g), ½ Inch Tertiary Flakes (140/272.7g), ½ Inch Unifaces (6/45.2g), ¼ Inch Burins (1/2.3g), ¼ Inch Primary Flakes (63/35.6g), ¼ Inch Secondary Flakes (350/161.3g), ¼ Inch Shatter (251/113.1g), ¼ Inch Tertiary Flakes (1071/353.1g), ¼ Inch Unifaces (5/3.8g).

The Coastal Plain-Heat Treated Chert (CP-HT) materials numbered in 375 pieces of debitage weighing 494.35 grams. This was sorted as follows: 1 Inch Core Fragments (3/69.4g), 1 Inch Primary Flakes (1/21.25g), 1 Inch Secondary Flakes (1/30.4g), ½ Inch Core Fragments (8/55.6g), ½ Inch Primary Flakes (2/7.7g), ½ Inch Secondary Flakes (21/67.2g), ½ Inch Shatter (3/9.8g), ½ Inch Tertiary Flakes (34/88.4g), ¼ Inch Primary Flakes (3/1.2g), ¼ Inch Secondary Flakes (17/11.4g), ¼ Inch Shatter (163/84.9g), ¼ Inch Tertiary Flakes (119/47.1g).

The Dacite materials numbered in 3 pieces of debitage and weighed 10.8 grams. They were all sorted as ½ Inch Tertiary Flakes.

The Diabase materials numbered in 57 pieces of debitage and weighed 341 grams. This was sorted as follows: 1 Inch Core Fragments (2/262.4g), ½ Inch Core Fragments (5/31.4g), ½ Inch Secondary Flakes (5/18.7g), ½ Inch Tertiary Flakes (4/5.7g), ¼ Inch Secondary Flakes (4/3.6g), ¼ Inch Shatter (28/15.7g), ¼ Inch Tertiary Flakes (9/3.5g).

The Diorite materials numbered in 1 piece of debitage and weighed 68 grams. This was sorted as 1 Inch Core Fragments

The Gneiss materials numbered at 1 piece of debitage and weighed .07 grams. This was sorted as ¼ Inch Shatter.

The Meta-slate material was numbered at 13 pieces of debitage and weighed 8 grams. This was sorted as: ¼ Inch Secondary Flakes (6/5.4g), ¼ Inch Shatter (7/2.6g)

The Modern Glass material was numbered at 14 pieces of debitage and weighed 5.8 grams. This was sorted as follows: ½ Inch Core Fragments (1/2.7g), ¼ Inch Shatter (2/1.1g), ¼ Inch Tertiary Flakes (11/2g).

The Novaculite material was numbered at 92 pieces of debitage and weighed 52.57 grams. This was sorted as follows: ½ Inch Tertiary Flakes (10/22g), ½ Inch Tools (1/4.7g) ¼ Inch Secondary Flakes (2/.07g), ¼ Inch Shatter (8/2.1g), ¼ Inch Tertiary Flakes (71/20.6g).

The Obsidian material was numbered at 132 pieces of debitage and weighed 133.7 grams. This was sorted as follows: 1 Inch Broken Prismatic Cores (1/23.9g), 1 Inch Primary Flakes (2/28.3g), ½ Inch Core Fragments (1/9.1g), ½ Inch Secondary Flakes (8/23.7g), ½ Inch Tertiary Flakes (6/16.6g), ¼ Inch Secondary Flakes (5/2.2g), ¼ Inch Shatter (9/2.7g), ¼ Inch Tertiary Flakes (100/27.2g).

The Quartz material was numbered at 309 pieces of debitage and weighed 885.1 grams. This was sorted as follows: 1 Inch Cores (6/301.8g), ½ Inch Bipolar Reduction Material (7/113.8g), ½ Inch Broken Bifaces (1/12.5g), ½ Inch Secondary Flakes (14/88.1g), ½ Inch Shatter (7/47.5g), ½ Inch Tertiary Flakes (43/164.4g), ¼ Inch Drill/Awls (1/16.4g), ¼ Inch Primary Flakes (2/2.7g), ¼ Inch Secondary Flakes (19/11.1g), ¼ Inch Shatter (24/15.7g), ¼ Inch Tertiary Flakes (185/111.1g).

The Quartzite material was numbered at 97 pieces of debitage and weighed 396.2 grams. This was sorted as follows: 1 Inch Bipolar Reduction Material (2/89.5g), 1 Inch Secondary Flakes (1/34.4g), 1 Inch Tertiary Flakes (1/66.9g), ½ Inch Secondary Flakes (5/55.8g), ½ Inch Tertiary Flakes (14/54.3g), ¼ Inch Primary Flakes (1/2g), ¼ Inch Secondary Flakes (5/61g), ¼ Inch Shatter (5/3.1g), ¼ Inch Tertiary Flakes(63/29.2g)/

The Red Brick Material was numbered at 5 pieces of debitage and weighed 29.36 grams. This was sorted as follows: 1 Inch Broken Bifaces (1/26.7g), ¼ Inch Secondary Flakes (2/2.4g), ¼ Inch Shatter (1/.09g), ¼ Inch Tertiary Flakes (1/.17g).

The Rhyolite material was numbered at 142 pieces of debitage and weighed 426.7 grams. This was sorted as follows: 1 Inch Broken Tools (1/41.3g), 1 Inch Core Fragments (3/117g), 1 Inch Secondary Flakes (2/97.7g), 1 Inch Tertiary Flakes (1/9.1g), ½ Inch Primary Flakes (1/3g), ½ Inch Secondary Flakes (3/12.8g), ½ Inch Shatter (6/16.8g), ½ Inch Tertiary Flakes (14/87.3g), ¼ Inch Secondary Flakes (7/3.2g), ¼ Inch Shatter (22/9.2g), ¼ Inch Tertiary Flakes (82/29.3g).

The Ridge and Valley Chert material was numbered at 243 pieces and weighed 602.9 grams. This was sorted as follows: 1 Inch Cores (1/215.9g), 1 Inch Core Fragments (3/111.1g), 1 Inch Primary Flakes (2/52.9g), 1 Inch Secondary Flakes (2/24.5g), ½ Inch Primary Flakes (1/6.7g), ½ Inch Secondary Flakes (13/47.2g), ½ Inch Shatter (3/8g), ½ Inch Tertiary Flakes (17/52.7g), ½ Inch Unifaces (3/5.5g), ¼ Inch Broken Bifaces (1/2.1g), ¼ Inch Secondary Flakes (19/9g), ¼ Inch Shatter (57/23.3g), ¼ Inch Tertiary Flakes (121/44g).

The Soapstone material was numbered at 1 piece of debitage and weighed 1.1 grams. This was sorted as ¼ Inch Shatter.

The Unidentified material was numbered at 10 pieces of debitage and weighed 13.7 grams. This was sorted as follows: ½ Inch Shatter (1/3g), ½ Inch Tertiary Flakes (3/7.2g), ¼ Inch Shatter (6/3.5g).

The West Texas Chert (Georgetown chert) material was numbered at 41 pieces of debitage and weighed 140.9 grams. This was sorted as follows: 1 Inch Primary Flakes (1/25g), 1 Inch Secondary Flakes (1/14g), ½ Inch Core Fragments (1/25.5g), ½ Inch Primary Flakes (1/3g), ½ Inch Secondary Flakes (5/36.7g), ½ Inch Shatter (2/15.3g), ½ Inch Tertiary Flakes (7/10.1g), ¼ Inch Secondary Flakes (4/2.9g), ¼ Inch Shatter (3/1.2g), ¼ Inch Tertiary flakes (16/7.2g).

Table 1

	Amorphous Rocks	Bifacial Cores	Bipolar Reduction Material	Broken Bifaces	Broken Prismatic Cores	Broken Tools	Broken Unifaces	Burins	PPKs	Cores	Core Fragments	Drill/Awl	N/A	Primary Flakes	Secondary Flakes	Shatter	Tertiary Flakes	Tools	Uniface
Ceramic																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	1/10.8	-	-	-	3/4.3	-	4/11.9	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12/6.2	11/6.2	16/5.2	-	-
CP-NHT Chert																			
1 Inch	1/44.6	-	-	2/146.5	-	-	1/20.3	-	-	6/1007.6	26/799.6	-	-	3/77.14	4/53.1	-	2/27.4	-	1/16.2
1/2 Inch	-	-	-	-	-	-	-	-	1/3	-	-	-	-	27/127	132/391.7	41/146.1	140/272.7	-	6/45.2
1/4 Inch	-	-	-	-	-	-	-	1/2.3	-	-	-	-	-	63/35.6	350/161.3	251/113.1	1071/353.1		5/3.8
CP-HT Chert																			
1 Inch	-	-	-	-	-	-	-	-	-	-	3/69.4	-	-	1/21.25	1/30.4	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	8/55.6	-	-	2/7.7	21/67.2	3/9.8	34/88.4	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	3/1.2	17/11.4	163/84.9	119/47.1	-	-
Dacite																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3/10.8	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diabase																			
1 Inch	-	-	-	-	-	-	-	-	-	-	2/262.4	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	5/31.4	-	-	-	5/18.7	-	4/5.7	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4/3.6	28/15.7	9/3.5	-	-
Diorite																			
1 Inch	-	-	-	-	-	-	-	-	-	-	1/68	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gneiss																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/.7	-	-	-
Metaslate																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6/5.4	7/2.6	-	-	-
Modern Glass																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	1/2.7	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/1.1	11/2	-	-

Table 1 cont.

	Amorphous Rocks	Bifacial Cores	Bipolar Reduction Material	Broken Bifaces	Broken Prismatic Cores	Broken Tools	Broken Unifaces	Burins	PPKs	Cores	Core Fragments	Drill/Awl	N/A	Primary Flakes	Secondary Flakes	Shatter	Tertiary Flakes	Tools	Uniface
Novaculite																			
1Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10/22	1/4.7	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/.07	8/2.1	71/20.6	-	-
Obsidian																			
1 Inch	-	-	-	-	1/23.9	-	-	-	-	-	-	-	-	-	2/28.3	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	1/9.1	-	-	-	8/23.7	-	6/16.6	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5/2.2	9/2.7	100/27.2	-	-
Quartz																			
1 Inch	-	-	-	-	-	-	-	-	-	6/301.8	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	7/113.8	1/12.5	-	-	-	-	-	-	-	-	-	-	14/88.1	7/47.5	43/164.4	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	1/16.4	-	2/2.7	19/11.1	24/15.7	185/111.1	-	-
Quartzite																			
1 Inch	-	-	2/89.5	-	-	-	-	-	-	-	-	-	-	-	1/34.4	-	1/66.9	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5/55.8	-	14/54.3	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2	5/61	5/3.1	63/29.2	-	-
Red Brick Material																			
1 Inch	-	-	-	1/26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/2.4	1/.09	1/.17	-	-
Rhyolite																			
1 Inch	-	-	-	-	-	1/41.3	-	-	-	-	3/117	-	-	-	2/97.7	-	1/9.1	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3	3/12.8	6/16.8	14/87.3	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7/3.2	22/9.2	82/29.3	-	-
R & V Chert																			
1 Inch	-	-	-	-	-	-	-	-	-	1/215.9	3/111.1	-	-	2/52.9	2/24.5	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	1/6.7	13/47.2	3/8	17/52.7	-	3/5.5
1/4 Inch	-	-	-	1/2.1	-	-	-	-	-	-	-	-	-	-	19/9	57/23.3	121/44	-	-
Soapstone																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/1.1	-	-	-
Unidentified																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3	3/7.2	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6/3.5	-	-	-

Table 1 cont.

	Amorphous Rocks	Bifacial Cores	Bipolar Reduction Material	Broken Bifaces	Broken Prismatic Cores	Broken Tools	Broken Unifaces	Burins	PPKs	Cores	Core Fragments	Drill/Awl	N/A	Primary Flakes	Secondary Flakes	Shatter	Tertiary Flakes	Tools	Uniface
West Texas Chert																			
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	1/25	1/14	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	1/25.5	-	-	1/3	5/36.7	2/15.3	7/10.1	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4/2.9	3/1.2	16/7.2	-	-

Jones' Results

The descriptions of my analysis, after Jones's corrections, of material types are, shown in Table 2, as follows.

The Amphibolite material was numbered at 1 piece of debitage and weighed 70.9 grams. This was sorted as 1 Inch Core Fragments.

The Ceramic material was numbered at 36 pieces of debitage and weighed 44.6 grams. This was sorted as follows: ½ Inch Secondary Flakes (3/4.3g), ½ Inch Shatter (1/10.8g), ½ Inch Tertiary Flakes (4/11.9g), ¼ Inch Secondary Flakes (12/6.2g), ¼ Inch Shatter (11/6.2g), ¼ Inch Tertiary Flakes (16/5.2g),

The CP-NHT Chert was numbered at 2,105 pieces of debitage and weighed 3798.6 grams. This was sorted as follows: 1 Inch Amorphous Rocks (5/120.7g), 1 inch Biface Core Fragments (3/173.1g), 1 Inch Biface Thinning Flakes (3/40.1g), 1 Inch Broken Tools (1/16.2g), 1 Inch Cores (4/788g), 1 Inch Core Fragments (4/268.6g), 1 Inch Primary Flakes (14/447.4g), 1 Inch Secondary Flakes (8/265.g), 1 Inch Shatter (1/19.7g), 1 Inch Tertiary Flakes (3/62.1g), ½ Inch Biface Thinning Flakes (12/37.3g), ½ Inch PP/Ks (1/3g), ½ Inch Primary Flakes (26/121.8g), ½ Inch Secondary Flakes (128/372g), ½ Inch Shatter (39/117.7g), ½ Inch Tertiary Flakes (133/267.6g), ½ Inch Tools (1/20g), ¼ Inch Burins (2/3.4g), ¼ Inch Primary Flakes (63/35.6g), ¼ Inch Secondary Flakes (339/155.1g), ¼ Inch Shatter (251/113.1g), ¼ Inch Tertiary Flakes (1064/350.2g).

The CP-HT Chert material was numbered at 369 pieces of debitage and weighed 496.1 grams This was sorted as follows: 1 Inch Core Fragments (2/41.2g), 1 Inch Heated Shatter (1/28.1g), 1 Inch Secondary Flakes (1/30.4g), ½ Inch Broken Bifaces (1/3.1g), ½ Inch Broken Tools (1/10.8g),½ Inch Primary Flakes (3/12.6g), ½ Inch Secondary Flakes (16/62.9g), ½ Inch

Shatter (32/142.7g), ½ Inch Tertiary Flakes (15/24.3g), ¼ Inch Heated Shatter (3/1.3g), ¼ Inch Primary Flakes (3/1.2g), ¼ Inch Secondary Flakes (17/11.4g), ¼ Inch Shatter (165/82.9g), ¼ Inch Tertiary Flakes (109/43.2g).

The Dacite material was numbered at 15 pieces of debitage and weighed 14.4 grams. This was sorted as follows: ½ Inch Tertiary Flakes (3/10.8g), ¼ Inch Secondary Flakes (1/0.6g), ¼ Inch Tertiary Flakes (11/3g).

The Diabase material was numbered at 71 pieces of debitage and weighed 284.6 grams. This was sorted as follows: 1 Inch Core Fragments (1/191g), ½ Inch Core Fragments (5/31.4g), ½ Inch Secondary Flakes (7/25.6g), ½ Inch Tertiary Flakes (4/5.7g), ¼ Inch Secondary Flakes (10/9.1g), ¼ Inch Shatter (35/18.3g), ¼ Inch Tertiary Flakes (9/3.5g).

The Diorite material was numbered at 1 piece and weighed 68 grams. This sorted as a 1 Inch Broken Tool.

The Gneiss material was numbered at 1 piece and weighed 0.7g. This was sorted as a piece of ¼ Inch Shatter (1/0.7g).

The Modern Glass material was numbered at 15 pieces and weighed 7.3 grams. This was sorted as follows: ½ Inch Shatter (1/2.7g), ¼ Inch Shatter (2/1.1g), ¼ Inch Tertiary Flakes (12/3.5g).

The Novaculite-NHT material was numbered at 106 pieces of debitage and weighed 57.8 grams. This was sorted as follows: ½ Inch Biface Thinning Flakes (5/13.7g), ½ Inch Tertiary Flakes (5/8.3g), ½ Inch Utilized Flakes (1/4.7g), ¼ Inch Secondary Flakes (2/0.7g), ¼ Inch Shatter (8/2.1g), ¼ Inch Tertiary Flakes (85/28.3g).

The Novaculite-HT material was numbered at 3 pieces and weighed 11.1 grams. This was sorted as follows: ½ Inch Shatter (2/4.1g), ½ Inch Tools (1/7g).

The Obsidian material was numbered at 131 pieces of debitage and weighed 132.3 grams. This was sorted as follows: 1 Inch Broken Prismatic Cores (1/23.9g), 1 Inch Secondary Flakes (2/28.3g), ½ Inch Core Fragments (1/9.1g), ½ Inch Secondary Flakes (8/23.7g), ½ Inch Tertiary Flakes (5/15.2g), ¼ inch Secondary Flakes (5/2.2g), ¼ Inch Shatter (9/2.7g), ¼ Inch Tertiary Flakes (100/27.2g).

The Quartz material was numbered at 305 pieces of debitage and weighed 802.5 grams. This was sorted a follows: 1 Inch Bipolar Cores (1/56.7g), 1 Inch Cores (2/149g), 1 Inch Secondary Flakes (3/95.6g), ½ Inch Broken Bifaces (2/28.9g), ½ Inch Primary Flakes (2/10g), ½ Inch Secondary Flakes (9/67.8g), ½ Inch Shatter (16/119.6g), ½ Inch Tertiary Flakes (40/134.3g), ¼ Inch Primary Flakes (2/2.7g), ¼ inch Secondary Flakes (19/11.1g), ¼ Inch Shatter (24/15.7g), ¼ Inch Tertiary Flakes (185/111.1g).

The Quartzite material was numbered at 101 grams and weighed 421 grams. This was sorted as follows: 1 Inch Bifaces (1/66.9g), 1 Inch Bipolar Reduction Material (2/62.2g), 1 Inch Primary Flakes (1/59.8g), ½ Inch Bipolar Reduction Material (3/79.8g), ½ Inch Secondary Flakes (5/55.8g), ½ Inch Tertiary Flakes (15/56.1g), ¼ Inch Primary Flakes (1/2g), ¼ Inch Secondary Flakes (5/6.1g), ¼ Inch Shatter (5/3.1g), ¼ Inch Tertiary Flakes (63/29.2g).

The Red Brick Material was numbered at 5 pieces of debitage and weighed 29.36 grams. This was sorted as follows: 1 Inch Broken Bifaces (1/26.7g), ¼ Inch Secondary Flakes (2/2.4g), ¼ Inch Shatter (1/0.09g), ¼ Inch Tertiary Flakes (1/0.17g).

The Rhyolite material was numbered at 138 pieces of debitage and weighed 416.9 grams. This was sorted as follows: 1 Inch Broken Tools (1/41.3g), 1 Inch Core Fragments (2/88.2g), 1 Inch Secondary flakes (3/126.1g), 1 Inch Tertiary flakes (1/9.1g), ½ Inch Secondary Flakes

(1/5.9g), ½ Inch Shatter (6/16.8g), ½ Inch Tertiary Flakes (15/88.7g), ¼ Inch Secondary Flakes (5/2.3g), ¼ Inch Shatter (22/9.2g), ¼ Inch Tertiary Flakes (82/29.3g).

The Ridge and Valley Chert material was numbered at 215 pieces of debitage and weighed 574.9 grams. This was sorted as follows: 1 Inch Biface Thinning Flakes (1/9g), 1 Inch Cores (1/215.9g), 1 Inch Core Fragments (2/81.6g), 1 Inch Primary Flakes (3/82.1g), 1 Inch Secondary Flakes (1/15.4g), ½ Inch Primary Flakes (1/3g), ½ Inch Secondary Flakes (11/39.1g), ½ Inch Shatter (3/8g), ½ Inch Tertiary Flakes (21/54.4g), ¼ Inch Secondary Flakes (19/8.7g), ¼ Inch Shatter (57/25.3g), ¼ Inch Tertiary Flakes (95/32.4g).

The Soapstone material was numbered at 1 piece of debitage and weighed 1.1 gram. This was all sorted as ¼ Inch Shatter.

The Unidentified-NHT was numbered at 17 pieces of debitage and weighed 29.9 grams. This was sorted as follows: ½ Inch Primary Flakes (1/6.7g), ½ Inch Shatter (1/3g), ½ Inch Tertiary Flakes (4/13.7g), ¼ Inch Secondary Flakes (5/3g), ¼ Inch Shatter (6/3.5g).

The Unidentified -HT material was numbered at 1 piece of debitage and weighed 1.2 grams. This was all sorted as ¼ Inch Tertiary Flakes.

The West Texas Chert (Georgetown Chert) material was numbered at 73 pieces of debitage and weighed 170.28 grams. This was sorted as follows: 1 Inch Secondary Flakes (1/14g), 1 Inch Tertiary Flakes (1/25g), ½ Inch Core Fragments (1/25.5g), ½ Inch Primary Flakes (1/3g), ½ Inch Secondary Flakes (5/42.8g), ½ Inch Shatter (2/15.3g), ½ Inch Tertiary Flakes (11/20.3g), ¼ Inch Biface Thinning Flakes (3/1.8g), ¼ Inch Broken Bifaces (1/2.1g), ¼ Inch Secondary Flakes (9/5.5g), ¼ Inch Shatter (2/0.08g), ¼ Inch Tertiary Flakes (36/14.9g).

Table 2

	Amorphous Rocks	Bifaces	Biface Core Fragments	Biface Thinning Flakes	Bipolar Cores	Bipolar Reduction Material	Broken Bifaces	Broken Prismatic Cores	Broken Tools	Burins	PPK/s	Cores	Core Fragments	Heated Shatter	N/A	Primary Flakes	Secondary Flakes	Shatter	Tertiary Flakes	Tools	Utilized Flakes
Amphibolite																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	1/70.9	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ceramic																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3/4.3	1/10.8	4/11.9	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12/6.2	11/6.2	16/5.2	-	-
CP-NHT Chert																					
1 Inch	5/120.7	-	3/173.1	3/40.1	-	-	-	-	1/16.2	-	-	4/788	4/268.6	-	-	14/447.4	8/265.9	1/19.7	3/62.1	-	-
1/2 Inch	-	-	-	12/37.3	-	-	-	-	-	-	1/3	-	-	-	-	26/121.8	128/372	39/117.7	133/267.6	1/20	-
1/4 Inch	-	-	-	-	-	-	-	-	-	2/3.4	-	-	-	-	-	63/35.6	339/155.1	251/113.1	1064/350.2	-	-
CP-HT Chert																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	2/41.2	1/28.1	-	-	1/30.4	-	-	-	
1/2 Inch	-	-	-	-	-	-	1/3.1	-	1/10.8	-	-	-	-	-	-	3/12.6	16/62.9	32/142.7	15/24.3	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	3/1.3	-	3/1.2	17/11.4	165/82.9	109/43.2	-	-
Dacite																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3/10.8	-	-
1/4 Inch	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	1/0.6	-	11/3	-	-
Diabase																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	1/191	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	5/31.4	-	-	-	7/25.6	-	4/5.7	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10/9.1	35/18.3	9/3.5	-	-
Diorite																					
1 Inch	-	-	-	-	-	-	-	-	1/68	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gneiss																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/0.7	-	-	-
Modern Glass																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2.7	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/1.1	12/3.5	-	-

Table 2 cont.

	Amorphous Rocks	Bifaces	Biface Core Fragments	Biface Thinning Flakes	Bipolar Cores	Bipolar Reduction Material	Broken Bifaces	Broken Prismatic Cores	Broken Tools	Burins	PPK/s	Cores	Core Fragments	Heated Shatter	N/A	Primary Flakes	Secondary Flakes	Shatter	Tertiary Flakes	Tools	Utilized Flakes
Novaculite-NHT																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	5/13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5/8.3	-	1/4.7
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/0.7	8/2.1	85/28.3	-	-
Novaculite-HT																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/4.1	-	1/7	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Obsidian																					
1 Inch	-	-	-	-	-	-	-	1/23.9	-	-	-	-	-	-	-	-	2/28.3	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	1/9.1	-	-	-	8/23.7	-	5/15.2	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5/2.2	9/2.7	100/27.2	-	-
Quartz																					
1 Inch	-	-	-	-	1/56.7	-	-	-	-	-	-	2/149	-	-	-	-	3/95.6	-	-	-	-
1/2 Inch	-	-	-	-	-	-	2/28.9	-	-	-	-	-	-	-	-	2/10	9/67.8	16/119.6	40/134.3	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/2.7	19/11.1	24/15.7	185/111.1	-	-
Quartzite																					
1 Inch	-	1/66.9	-	-	-	2/62.2	-	-	-	-	-	-	-	-	-	1/59.8	-	-	-	-	-
1/2 Inch	-	-	-	-	-	3/79.8	-	-	-	-	-	-	-	-	-	-	5/55.8	-	15/56.1	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2	5/6.1	5/3.1	63/29.2	-	-
Red Brick Material																					
1 Inch	-	-	-	-	-	-	1/26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/2.4	1/.09	1/.17	-	-
Rhyolite																					
1 Inch	-	-	-	-	-	-	-	-	1/41.3	-	-	-	2/88.2	-	-	-	3/126.1	-	1/9.1	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/5.9	6/16.8	15/88.7	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5/2.3	22/9.2	82/29.3	-	-
R & V Chert																					
1 Inch	-	-	-	1/9	-	-	-	-	-	-	-	1/215.9	2/81.6	-	-	3/82.1	1/15.4	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3	11/39.1	3/8	21/54.4	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19/8.7	57/25.3	95/32.4	-	-
Soapstone																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/1.1	-	-	-

Table 2 cont.

	Amorphous Rocks	Bifaces	Biface Core Fragments	Biface Thinning Flakes	Bipolar Cores	Bipolar Reduction Material	Broken Bifaces	Broken Prismatic Cores	Broken Tools	Burins	PPK/s	Cores	Core Fragments	Heated Shatter	N/A	Primary Flakes	Secondary Flakes	Shatter	Tertiary Flakes	Tools	Utilized Flakes
Unidentified -NHT																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/6.7	-	1/3	4/13.7	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5/3	6/3.5	-	-	-
Unidentified - HT																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/1.2	-	-
West Texas Chert																					
1 Inch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/14	-	1/25	-	-
1/2 Inch	-	-	-	-	-	-	-	-	-	-	-	-	1/25.5	-	-	1/3	5/42.8	2/15.3	11/20.3	-	-
1/4 Inch	-	-	-	3/1.8	-	-	1/2.1	-	-	-	-	-	-	-	-	-	9/5.5	2/.08	36/14.9	-	-

Differences

The differences between my results and Jones' corrections were counted based on the total number of misidentified pieces of debitage. This was done to have a final count of inaccurate identifications I had made before re-sorting the pieces of debitage into their correct groupings. This also in some cases meant I had to either delete or add a new raw material or artifact category, such as with the deletion of the Uniface category and the addition of the Biface Thinning Flaks category. The number of corrections in each category might not match when comparing the tables. This is due to some categories having pieces taken out of them as well as pieces put into them, this fact explains why some categories have the same amount of debitage while gaining or losing weight. The differences are as follows:

The entire addition of the Amphibolite (artifact type: Core Fragment) raw material category was a correction (1 piece weighing 70.9 grams).

The Ceramic (non-lithic material) differences are as follows: The Core Fragments category had a loss of 1 piece weighing 10.8 grams, The Shatter category had an addition of 1 piece weighing 10.8 grams.

The CP-NHT Chert differences are as follows: The Amorphous Rock category had an addition of 4 pieces weighing 76.1 grams, The Biface Core Fragment category, a new category, was comprised of 3 pieces weighing 173.1 grams, The Biface Thinning Flakes category, a new category, was comprised of 15 pieces weighing 77.4 grams, The Broken Tools category had an addition of 1 piece weighing 16.2 grams, The Cores category had a subtraction of 2 pieces weighing 219.6 grams, The Core Fragments category had a subtraction of 22 pieces weighing 531 grams, The Primary Flakes category had an addition of 10 pieces weighing 365.06 grams, The Secondary Flakes category had a subtraction of 11 pieces while gaining 186.9 grams in

weight, The Shatter category had a subtraction of one piece weighing 8.7 grams, The Tertiary Flakes category had a subtraction of 13 pieces while gaining 26.7 grams in weight, The Tools category had an addition of 1 piece weighing 20 grams.

The CP-HT Chert differences are as follows: The Broken Biface category had an addition of 1 piece weighing 3.1 grams, The Broken Tools category had an addition of 1 piece weighing 10.8 grams, The Core Fragments category had a subtraction of 9 pieces weighing 83.8 grams, The Heat Shatter category, a new category, was comprised of 4 pieces weighing 29.4 grams. The Primary Flakes category count remained the same while losing 16.35 grams in weight, The Secondary Flakes category had a subtraction of 5 pieces weighing 4.3 grams. The Shatter category had an addition of 31 pieces weighing 130.9 grams, The Tertiary Flakes category had a subtraction of 29 pieces weighing 68 grams.

The Dacite differences are as follows: The Secondary Flakes category had an addition of 1 piece weighing 0.6 grams, The Tertiary Flakes category had an addition of 11 pieces weighing 3 grams.

The Diabase differences are as follows: The Core Fragments category had a subtraction of 1 piece weighing 71.4 grams, The Secondary Flakes category had an addition of 8 pieces weighing 12.4 grams, The Shatter category had an addition of 7 pieces weighing 2.6 grams.

The Diorite material was misidentified as Core Fragments. It was corrected as Broken Tools (1 piece weighing 68 grams).

All the Meta-slate material was misidentified and put into its correct raw material groups. There was no actual Meta-slate.

The Modern Glass differences are as follows: The Shatter category had an addition of 1 piece weighing 2.7 grams. The Tertiary Flakes category had an addition of 1 piece weighing 1.5 grams. The Core Fragment category had a subtraction of 1 piece weighing 2.7 grams.

The Novaculite-NHT differences are as follows: The Biface Thinning Flakes category, a new category, was comprised of 5 pieces weighing 13.7 grams, The Tertiary Flakes category had an addition of 9 pieces while losing 6 grams in weight, The Tools category was misidentified and was corrected as Utilized Flakes (1 piece weighing 4.7 grams).

The Novaculite-HT raw material was a new category found with the corrections. This had an addition of Shatter with 2 pieces weighing 4.1 grams, as well as Tools with 1 piece weighing 7 grams.

The Obsidian differences were as follows: The Tertiary Flakes category had a subtraction of 1 piece weighing 1.4 grams.

The Quartz differences were as follows: The Bipolar Cores category, a new category, was comprised of 1 piece weighing 56.7 grams, The Broken Bifaces category had an addition of 1 piece weighing 16.4 grams, The Cores category had a subtraction of 4 pieces weighing 152.8 grams, The Primary Flakes category had an addition of 2 pieces weighing 10 grams, The Secondary Flakes had a subtraction of 2 pieces while gaining 75.3 grams, The Shatter category had an addition of 9 pieces weighing 72.1 grams, The Tertiary Flakes category had a subtraction of 3 pieces weighing 30.1 grams. The Bipolar Reduction Material category had a subtraction of 7 pieces weighing 113.8 grams, The Drill/Awl category had a subtraction of 1 piece weighing 16.4 grams.

The Quartzite differences were as follows: The Bifaces category, a new category, was comprised of 1 piece weighing 66.9 grams, The Bipolar Reduction Materials category had an

addition of 3 pieces weighing 52.5 grams, The Primary Flakes category had an addition of 1 piece weighing 59.8 grams, The Secondary Flakes category had a subtraction of 1 piece weighing 34.4 grams, The Tertiary Flakes category count remained the same, while the weight had a subtraction of 65.1 grams.

The Rhyolite differences are as followed: The Core Fragments category had a subtraction of 1 piece weighing 28.8 grams, The Primary Flakes category had a subtraction of 1 piece weighing 3 grams, The Secondary Flakes category had a subtraction of 3 pieces while gaining 20.6 grams, The Tertiary Flakes category had an addition of 1 piece weighing 1.4 grams.

The Ridge and Valley Chert differences are as follows: The Biface Thinning Flakes category, a new category, was comprised of 1 piece weighing 9 grams, The Core Fragments category had a subtraction of 1 piece weighing 29.5 grams, The Primary Flakes category had an addition of 1 piece weighing 25.5 grams, The Secondary Flakes category had a subtraction of 3 pieces weighing 17.5 grams, The Tertiary Flakes category had a subtraction of 22 pieces weighing 9.9 grams, The Broken Bifaces category had a subtraction of 1 piece weighing 2.1 grams, The Unifaces category had a subtraction of 3 pieces weighing 5.5 grams.

The Unidentified-NHT differences are as follows: The Primary Flakes category had an addition of 1 piece weighing 6.7 grams, The Secondary Flakes category had an addition of 5 pieces weighing 3 grams, The Tertiary Flakes category had an addition of 1 piece weighing 6.5 grams,

The Unidentified-HT raw material was a new category found with the corrections. This had an addition of Tertiary Flakes with 1 piece weighing 1.2 grams.

The West Texas Chert (Georgetown Chert) differences are as follows: The Biface Thinning Flakes category, a new category, was comprised of 3 pieces weighing 1.8 grams, The

Broken Bifaces category had an addition of 1 piece weighing 2.1 grams, The Primary Flakes category had a subtraction of 1 piece weighing 25 grams, The Secondary Flakes category had an addition of 5 pieces weighing 8.7 grams, The Shatter category had a subtraction of 1 piece weighing 1.12 grams, The Tertiary Flakes category had an addition of 25 pieces weighing 42.9 grams.

Discussion

As stated before, the reliability and accuracy of mass analysis done by novitiate level analysts has been called into question. In particular, with regards to the identifying and sorting steps of the method, it has been suggested that due to inexperience, new analysts' results could be inaccurate and therefore unreliable. This is a large problem when in some cases new researchers/professionals in the field only have guided experience in the forms of field schools and classes. When these archaeologists transition into the field after their education is completed, they are expected to perform tasks while no longer being instructed or guided. This can lead to the unreliable results that many current researchers are wary of. My research aimed to gain a better understanding of this issue. This research's main goal was to try and see how accurate a novitiate level lithic analyst could complete the sorting and identifying steps of mass analysis.

After my research was finished there were some telling differences between my original analysis and Jones' corrections. In total there were 215 pieces of debitage out of 3,702 in total that were incorrectly identified. This as a percentage is 94.1% possibly correct. I say possibly, because as stated before, Jones sampled only 50 pieces from the sorted piles that were over 50 pieces in count. This means that in the sorted piles of over 50 there could have been a higher or lower percentage of incorrectly identified pieces. Jones concluded that even

with the possibility of my accuracy being lower, I was relatively successful in my identification experiment. My errors were attributed to various possibilities such as: experience level, conservative analysis, amount of raw material diversity, amount of artifact diversity, as well as unknown sources.

Together, experience level and conservative analysis I believe accounted for most of my error. In many cases these two variables are one in the same, but not always. A specific example of experience level error is I did not identify the Bifacial Thinning Flakes as a category. I was not able to find any without the corrections and advice from Jones. That entire artifact class was overlooked. They were identified originally as flake types depending on cortex amount, and therefore not classified as Biface Thinning flakes. An example of conservative analysis was found when I analyzed the Biface Core Fragments as Broken Bifaces. I didn't think there was enough evidence to determine whether the pieces of debitage were fully formed or not when they were broken. This, as stated before, could possibly be an example of inexperience in an analyst as well.

The vast amount of raw materials and artifact classes present could have been a factor in my errors as well. This is evident from me getting various materials mixed in with each other, such as me identifying some West Texas Chert as Ridge and Valley Chert, because of its smooth texture and high quality structuring while having similar colors. Due to the wide variety within the materials I believe I allowed myself to be influenced on material type by other pieces instead of adhering to characteristics in their definitions. This also holds true for the vast amounts of artifact categories I analyzed as well. An example of this would be how I tried to over analyze pieces within the Broken Tools category as Drills/Awls when there wasn't enough evidence to support it. I also want to state these errors could be related to experience as well.

Accuracy in lithic analysis is the most important quality to have. How we are able to understand how our prehistoric ancestors lived before us is extensively formed from theories based on studying lithics. We use mass analysis to study large collections of materials that give information into our ancestors' daily lives. The accuracy of analysts using this method is extremely important in that if results are wrong, then we don't truly know the daily tasks our ancestors accomplished. This accuracy is a foundation upon which we have formulated theories of the past and should always be held in high regard.

I learned from this research that this problem is far from being solved and/or understood fully. First, it is difficult to quantify and qualify one's level of experience along with what kind of experience in a standardized way. That is to say, what one person considers being a novice level may not be what another would agree with. This makes it difficult to establish an agreed upon amount of training that is required as well as who is qualified to do the training. It is also extremely difficult to measure one's accuracy during and after a lithic analysis is extremely difficult. One would have to have another analyst go over their work and his would be time-consuming, as well as near impossible to do especially in CRM, due to lack of funding and time required. A final issue that makes it difficult to discuss this problem of possible error with novitiate analysts is lack of publication. There are few if any analysts and researchers who publish on accuracy of previous work using actual research data.

Overall, I believe lithic analysis can be improved from the ideas mentioned above. We as archaeologists could conduct more research that aims to quantify the error done in past studies. This could be used to find ways in which to improve upon any error found among studies. Archaeologists could create more opportunities for students to practice lithic analysis. This would mean more opportunities for students to study lithics and how they are formed. A great example of this would be to allow students at the undergraduate level to accomplish

unguided lithic analyses on experimental collections and be shown their mistakes, similar to my experiment. This would allow novice level archaeologists to learn from their mistakes while in school before they start research and working as a professional, it is this researcher's opinion that before an archaeologist can procure a job in lithic analysis they should at least complete one lithic analysis during their education and it to be regarded as successful by experts. The most important way to improve the science of archaeology is to always continue to improve upon our research through testing our methods and practices constantly.

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