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# A Little Off the Top: A Controlled Archaeological Experiment on Scalping in America

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# A Little Off the Top: A Controlled Archaeological Experiment on Scalping in America

**Disciplines**  
Anthropology

A LITTLE OFF THE TOP:  
A CONTROLLED ARCHAEOLOGICAL EXPERIMENT ON SCALPING IN AMERICA

By

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In

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## Abstract

This thesis will discuss the execution and analysis of an archaeological experiment on scalping techniques in the Americas. The archaeological experiment was conducted to look at the evidence of scalping in Native American populations in order to better understand the mechanics, skeletal results, and emotional effects associated with the act of scalping. The history of scalping in America can be identified through both historical records and skeletal remains. However, the historical and skeletal record techniques are often cited independently of each other and as a result they appear to not match up. Six suckling pigs were scalped with a stone tool and metal knife using the two techniques. Through this research I was able to identify the fastest and most efficient ways to scalp, as well as how the act of scalping affected me emotionally. Moreover, by carrying out this experiment I learned that what I found to be the most efficient way to scalp is reflective of both the historical documents on the subject *and* of the skeletal remains we now designate as scalped skulls. In this way, I began to bridge the gap between historical and osteological evidence of scalping.

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## **Introduction**

The discipline of anthropology is one composed of many sub-fields, each vital to the broader understanding of humans and human history. Some of the more well known fields include archaeology and cultural anthropology; however, one of the lesser known concentrations, experimental archaeology, provides the anthropologist the best chance to truly understand what certain aspects of life were like for people in the past. Experimental archaeology allows anthropologists the opportunity to formulate and test hypotheses for the enhancement of analogies of archaeological interpretations (Mathieu, 2002). What makes experimental archaeology stand out from its sister concentrations is that it implements a variety of approaches, analyses, methods, and techniques in a controlled experiment to replicate past phenomenon. By posing a hypothesis under the umbrella of experimental archaeology, one is able to create an experiment from which to learn about the functional and even the phenomenological aspects of an element from the past.

This thesis will discuss the execution and analysis of an archaeological experiment on scalping techniques in the Americas. The archaeological experiment was conducted to look at the evidence of scalping in Native American populations in order to better understand the mechanics, skeletal results, and emotional effects associated with the act of scalping. The history of scalping in America can be identified through both historical records and skeletal remains. However, the historical and skeletal records are often cited independently of each other and as a result they appear to not match up; the mechanics of scalping as described in the historical record does not seem accurate, or at least complete enough, for the production of the skeletal remains archaeologists now classify as evidence for scalped skulls. Through this research I was able to identify the fastest and most efficient ways to scalp, as well as how the act

of scalping affected me emotionally. Moreover, by carrying out this experiment I learned that what I found to be the most efficient way to scalp is reflective of both the historical documents on the subject *and* of the skeletal remains we now designate as scalped skulls. In this way, I began to bridge the gap between historical and osteological evidence of scalping.

This experimental research was carried out on scalping techniques in order to answer questions specific to the research itself and to contribute to the field of anthropology as a whole. In terms of the experiment itself, it was important to perform the act in order to identify the most efficient way to scalp; I witnessed differences in variables such as tool type, technique, and articulation versus decapitation, to better understand what it meant to be a scalper as well as the emotional toll the act had on an individual. Conversely, in regards to the field of anthropology, this experiment had the potential of changing our perception of certain past populations. The acts undertaken over the course of the experiment revealed that what anthropologists consider to be scalping evidence on osteological remains is indeed the types of cut marks produced through scalping. Because of the infrequent use of both historical accounts and skeletal remains as evidence for scalping in research papers, there was never an explicit understanding that they could be one and the same, or at least be reflective of the same technique and event.

By experimenting with scalping techniques and being able to analyze known samples, I am able to infer that marks which have been classified as evidence for scalping on osteological remains is indeed scalping and not the result of a natural or unknown process. By better understanding the variety of resulting skeletal markings from scalping, anthropologists can avoid any possible faulty categorizations of societies as “scalping cultures” or *visa versa*. This thesis will present a brief background on scalping practices and techniques in the Americas and on

experimental archaeology before exploring the execution and results of the experiment undertaken.

## **Background**

### *Scalping in the Americas*

In order to fully understand the context and details of the experiment it is important to have a basic background on scalping in general, the history of scalping, and scalping techniques in America. The actual word “scalp” is of English derivation and refers most commonly to the skin found on the crown of the head. The notion of scalping, or the forced removal of the scalp from a person’s head, was not conceptualized and given an English term until the late 17<sup>th</sup> century (Friederici, 1907). Scalping, as it is perceived today, is an aggressive event usually associated with Native Americans cutting or tearing away the scalps of their enemies for trophies. However, the event may not have always fallen into those parameters and certainly was not limited to North America (Allen et al., 1985). The earliest related evidence for similar practices can be traced back to the Greeks of Herodotus’ time. The Scythian people were known for collecting enemies’ heads and scalps as trophies (Allen et al., 1985). Moreover, it is thought that both the practices of taking entire heads and shrinking heads were predecessors to the application of scalping.

For many decades, starting at the end of the nineteenth century, beginning of the twentieth century, there were continuing debates back and forth over the origins of scalping in the Americas. Originally, Europeans claimed that they were taught the practice by the native “savages,” while certain chiefs held that it was the invading settlers who gave them knives to take the skin off of “their [enemies’] heads” (Axtell and Sturtevant, 1980). Each party was



adamant that they were not the ones to originate the practice because of the array of negative connotations associated with scalping. Eventually, the arguments of hearsay were replaced with debates backed by evidence.

It is generally accepted today that there were scalping practices in the Americas before the arrival of Europeans; however, exactly when and how these practices in America began is still unknown. As early as 1520, explorers such as Francisco de Garay were writing in their journals about witnessing scalping acts being carried out by Native groups (Allen et al., 1985). In 1535 the first French explorer, Jacques Cartier, was shown scalps of Native Americans that were stretched over hoops and proudly displayed (Bray, 1986). Moreover, these early adventurers and explorers were being affected by these acts first hand. In 1540, de Soto describes the horrid event of having one of his own men scalped by the Natives of Florida (Friederici, 1907). While evidence for its existence around the time of contact is plentiful, the prehistoric evidence for the practice of scalping is rather sparse. At the time of this research, there was only one known prehistoric cemetery that had provided evidence for “mutilation by scalping” (Milner, 2007), the remainder of evidence is dated to the past two millennia.

Over time, the Europeans began to recognize linguistic evidence of specialized terms relating to scalping in Native American languages (Case, 1998), suggesting that the practice originated early on in their history and became such a part of their culture that it was reflected in their language. Friederici (1907) identified specialized terms in native languages for the actual scalp, the act of scalping, the scalping victim, and so forth. The linguistic tradition of scalping terms is a great asset in identifying the existence of scalping prior to the arrival of the Europeans; Native Americans are proud of their language and would not easily create or adopt terms into it, especially so soon after the first landing of Europeans on the continent.

Along with the existence of native words for the practice of scalping, there is a strong tradition surrounding the role of scalping in inter-tribal conflicts. Before Europeans ever set foot on American soil, Native American groups had been warring with each other for centuries. Wars could be started for a variety of reasons including revenge, jealousy, death of a family member, or even the desire for a scalp trophy (Bishop and Lytwyn, 2007). Over this time, scalping had taken on an important role. War between tribes very rarely resulted in deaths; there was mostly a great deal of skirmishing and coup counting (Welch, 1995). "Counting Coup" is a translation of a native term referring to nonviolent bravery and a warrior's ability to touch an enemy warrior and run away unharmed. Coups were recorder by notches on the "coup stick" or by the number of feathers in a warrior's headdress. The point was not to annihilate one's enemy but to humiliate him while gaining honors for oneself. Scalping was a slightly more violent form of coup counting. It was believed that a warrior's scalp symbolized his life force and for another to touch it in any way was considered a severe insult (Bray, 1986). It was therefore important to have the skill and courage to lift an enemy's scalp; it served as a humiliating warning to the enemy and a moral boost for the scalper and his tribesmen (Welch, 1995).

In effect, the collection of enemy's scalps became a show of prowess and something to be commended. In some societies, scalping was held in such high esteem that a scalping event could be seen as "*a National Act and Declaration of War*" (Bray, 1986). When removed by Native Americans, scalps became decorative. The removed scalp would be cleaned of the excess flesh, dried, and painted. Once the scalp was painted it could be stretched over hoops, placed on war spears, or used in the decoration of the house or village. It was believed that the scalp held many magical powers and without it a warrior could never go to the "happy hunting ground" (Goodrich, 1997). An added benefit to taking scalps, as was believed by scalping groups, was

that if you could purify it you would be able to make it a powerful spirit ally; it would empower the possessor with survival and reproductive fitness or it could be transformed into a rain maker (Chacon and Dye, 2007; Schaafsma, 2007).

European population of the New World did not deter the natives from practicing scalping; in fact the Europeans suggested the practice to their own people as a way to rid the land of the “savages” (Martin, 1998). Hefty sums would even been paid out for the presentation of a scalp to a government official as proof of the death of a Native American. The frightening thing was that it was near impossible to tell the difference between man and woman, adult and child, or even Native versus white man. Offering of bounties for scalps led to widespread violence against any person of Indian decent no matter sex or age (Goodrich, 1997; Martin, 1998).

As Europeans took to scalping the Native Americans, so too did the natives eventually begin to scalp the settlers. It was noted that hair was important in the selection of scalping victims, bald men were considered undesirable, saving a majority of white men from even being considered, and enemy native groups were still considered the most prestigious targets (Welch, 1995). There are also documented examples of scalping survivors (Figure 1), although most did eventually die from infection, some survived into old age. The last interesting point of the history of scalping in the Americas comes from the time of the French and Indian War. There is a collection of documents recounting how the French entered into agreements with the local native groups to scalp the English settlers (The Cruel Massacre, 1765; Chacon and Mendoza, 2007). If these accounts are true, than it would be interesting to consider how a practice originating among the Native American peoples as a way to humiliate their enemies became a tool of the invading Europeans to use against themselves.

### *Evidence for Scalping Techniques*

The best evidence for scalping techniques in the Americas comes from both historical records and skeletal remains. Most of the historical records consist of first-hand observations of scalping acts by the first explorers of the continent and the earliest residents of what was considered “hostile” area. These records are very similar in the descriptions of the acts; scalping took place quickly, the scalper would leverage himself by placing a knee or foot on the victim’s back, between the shoulder blades, and the scalp would be removed in one piece (Axtell and Sturtevant, 1980; Bray, 1986; Bueschgen and Case, 1996). Captain Francois Pouchot (1866) recounts how “*as soon as the man has fallen, they run to him, put their knee between his shoulders, take a lock of hair in one hand, and with their knife in the other give a blow separating the skin from the head.*” Another French writer describes the specifics of the actual removal of the scalp; that the skin of the head is pulled off back-to-front with the use of the hair as leverage (Bray, 1986). The presence of hair was of great importance in scalp taking, which was mentioned above, and it is even reflected in some of the historical accounts. Goodrich (1997) offers one story of a women’s scalp being taken “entirely off the head; the head had been skinned, taking all the hair.”

The actual scalping technique described in the historical records refers to a single cut starting at the brow and following to the back of the head; one cut on either side of the head (Axtell and Sturtevant, 1980). The cuts were made just above the line of the ear. This particular aspect of scalping is often romanticized, as can be seen through this recount, “they took off the scalps...from the ears up, with wonderful dexterity and skill,” (Dye and King, 2007). Ultimately, the technique described through personal recounts of witnessing the act is quite simple and straight forward. The victim was placed face-down, a knee was placed between the

shoulder blades for leverage, there were two cuts made, one on either side of the head from the forehead to the back of the neck, the scalp was removed in one motion, pulling from the back of the head to the front, and all of this was done in a timely manner to produce a whole scalp, complete with hair.

The second source of evidence that exists for scalping techniques is the skeletal remains themselves. A majority of the skeletal remains classified in the Americas as examples of scalping have the same general configuration of cut marks. In a study conducted by Patricia M. Lambert (2007) on a skeletal collection from the east shore of the Great Salt Lake, there were a number of cases with evidence of scalping. These remains were from approximately 650-990 AD. Skulls were found with cut marks going horizontally across the frontal bone just above where the ear line would have been in life. While this is something we would expect from the descriptions in the historical record, instances of this kind are by far the minority of cases. Conversely, a collection of scalped skulls from Arizona appear to have a much more varied pattern of cut marks. These skulls, from sites at Nuvakwewtaqa and Grasshopper Ruin show clusters of cut marks that form a rough circle around the skull from about the orbits to the nuchal crest (Allen et al., 1985). Overall, the cuts appeared to be short, as well as shallow, and appear in clusters as opposed to one singular line.

From these two representative examples, it is apparent that scalped skulls present with either a characteristic lesion on the frontal and parietals, and/or clusters of parallel lines around the calvarium (Case, 1998). The islands of parallel lines found on skulls (Figure 2) such as the ones seen in Arizona, do not seem to be results of any aspect of the historical technique as described above, and were the basis for this experiment. The question becomes whether the existence of these groups of cut marks found in the skeletal record represent a different technique

for scalping or if they are a form of the technique described in the historical record (Bueschgen and Case , 1996).

### *Experimental Archaeology*

The final background aspect to understand before dealing with the details of this thesis is a basic comprehension of the role and application of experimental archaeology and what its benefits are in a case such as this. Experimental archaeology is defined as

“a subfield of archaeological research which employs a number of different methods, techniques, analyses, and approaches within the context of a *controllable* imitative experiment to *replicate past phenomena* (from objects to systems) in order to *generate and test hypotheses* to provide or enhance *analogies* for *archaeological interpretation*.”  
(Mathieu, 2002)

This definition is somewhat overwhelming to take in all of the components of experimental archaeology at once, but it a complete and precise definition. However, in a simpler sense, experimental archaeology can be thought of as the attempt to apply experimental methods in various areas of archaeology to gain a better understanding of the past (Ingersoll and Macdonald, 1977). The highlighted phrases in the Mathieu definition clearly demonstrate the four aspects that comprise this subfield. Without control, replication, hypotheses, and the desire to enhance analogies, an experiment in archaeology cannot be considered an archaeological experiment.

Experiments can range from the reproduction of stone tools and hafting methods, to the recreation of entire sites such as the Overton Down earthwork which looked at formation processes (Jewell and Dimbleby, 1977) and nearly everything in between. There are a collection of experiments relating to biological remains, which is the area of experimental archaeology that this thesis will be looking at. Gill-Robinson (2002) did work with piglets in peat bogs to better understand the preservation/deterioration processes of these interesting environments and what that could add to the discussion of the ancient human remains found there. In a similar sense,

work was done on the faunal remains recovered from Fort Ligonier (Guilday, 1977) where a hypothesis was formulated to better understand the need to extrapolate from the collection of remains found because they are only a representative sample of what was originally at the site.

Another type of archaeological experiment concerned the butchering of a deer with obsidian tools (Hester et al., 1976). This study is of particular interest because it is a fine example of stone tool use in the skinning and preparing of an animal carcass. The experiment was concerned with detailed recordings and an assessment of the efficiency of both the tools and the technique. Knowledge and understanding of these types of studies helps in the creation of the design for this study and adds to the understanding of how non-human subjects are beneficial in experimenting to understand about human remains, as well as techniques employed by humans cultures that are no longer in use today.

## **Methodology**

### *Introduction*

Once the baseline of background knowledge in both scalping practices in the Americas and experimental archaeology was established, I formulated a detailed design for the experiment. As with any other experiment it was important to identify the procedures for testing, the variables to be tested, and the potential for confounding factors within the research. The design and experiment to be presented below should be considered a pilot thesis exploring the techniques and results of scalping practices as seen in Native American populations around the time of contact. The proceeding pages will cover the variety of steps required to carry out this thesis in a way that would be beneficial to the field as a whole.

### *Hypothesis and Predictions*

In order to create a feasible and accurate design, it was necessary to devise a hypothesis as well as a list of predictions to define the parameters of the experiment. The specific area to be considered in this experiment is the United States. As such the area to be considered was the territory under the control of the Native American populations around the time of contact. Taking this into account, it can be assumed that when scalping occurred between Native populations, time was critical because it was in a battle or raid context, efficiency was a must, and the advent of the metal knife would speed up the process in comparison to stone tools. The advent and use of metal tools would more than likely speed up the process of scalping due to the metal's sharpness and durability. Moreover, history documents the replacement of stone tools with metal ones over time (Cobb, 2003). The hypothesis I proposed is that scalping was performed in a variety of manners, in what ever way was fastest, most efficient, and suited the individual scalper. Moreover, time was a limiting factor, the knife would supersede the stone tool, and the historical descriptions of scalping are less accurate to the true execution of scalping than the skeletal evidence identified as scalping. The design of the experiment was such that it facilitated the testing of a series of predictions:

1. It will be easier to scalp an articulated specimen than a decapitated specimen.
2. It will be faster to scalp with a metal knife than with a stone tool.
3. It will be more efficient to scalp a specimen with my own instincts than by following the techniques outlined through historical descriptions.
4. The process of scalping will have some negative emotional consequences on me during the experiment, but these phenomenological experiences will be at a fraction of what they could be if I was scalping a fellow human and will dissipate over time.



5. The markings on the skulls of a majority of the pig cadavers will better resemble the skeletal evidence of scalping than the historical descriptions of scalping.

### *The Design*

The design of the experiment was based on the use of pig cadavers as substitutes for humans as the specimens of scalping. The subjects were six suckling pigs ranging in size from 16-19.5 lbs. and were procured from a local butcher within 48 hours of death and were kept frozen from death until pick-up. Prior to the experiment, under the direction of the butcher, the internal organs were removed according to US Federal Department of Agriculture and Massachusetts State Law regulating animal subjects for study. The pigs were picked-up mid-afternoon on Friday April 11, 2008 and were kept outside in boxes to thaw overnight for the experiment on Saturday April 12th. The night before the experiment, the two 16.5 lbs. specimens, were decapitated with a hand-held bow saw (Figure 3). It was decided to approach the experiment with two decapitated specimens because of some historical accounts suggesting decapitation occurred before or around the time of scalping (Goodrich, 1997).

The choice of pigs as the suitable experimental subject was made due to the inability to obtain human cadavers for the research. In addition, there were advantages of using suckling pigs as they: (1) did not present any of the same logistical or ethical problems associated with human remains; (2) were an acceptable test subject for experimentation in Massachusetts; (3) were relatively easily obtained through a personal contact with a butcher so that they were not altered by any unnecessary processes; (4) they provided conveniently sized whole corpses; and (5) they are physiologically similar to humans. The decision to use suckling pigs instead of adult pigs as human analogues was given much thought prior to the beginning of the study. Whereas adult pigs would have been the preferred subjects, they are also harder to come by, excessively

more expensive, and are on average 150 lbs. making portability, as well as accessibility, much harder (Gill-Robinson, 2002).

The subjects were scalped in different ways in order to detect what I, as the experimenter, considered to be the fastest and most efficient way. In the confines of the experiment, “efficiency” would be defined as the ability to produce a complete scalp and the lack of excess effort needed to detach the scalp from the skull. The cadavers were scalped with either a stone tool, made of obsidian, or a serrated metal knife (Figure 4). The selection of the tools for the experiment was based both on research into the resources available to Native Americans either in their particular region or through trade, as well as an understanding of what similar resources were at my availability. An obsidian tool, or more precisely an obsidian flake, was used because flakes are the sharpest results of stone tool knapping; any subsequent retouching will result in the desired shape of a tool, but also a duller blade. Makers of stone tools in history would have learned this fact and would have begun to use the flakes created from napping and would only retouch the end used for gripping (Cobb, 2003).

The choice of obsidian came from two distinct factors. First, although both obsidian and flint were used by natives in the Americas, the area from which many of the skeletal remains of scalping have been found is home to many of the North American obsidian deposits (Baugh and Nelson Jr., 1987). Second, obsidian was the element most readily available to me for testing. A professor in my department has a tool knapping station in his lab with a sand box full of discarded flakes. It is here that I procured an array of flakes; I tested the cutting ability of each on a forelimb of one of my specimens, identified the flake that cut through the flesh the best, and utilized this flake for the experiment. I wanted a blade that is at its sharpest and can be comparable to a modern metal knife. The use of an obsidian stone tool in this experiment will

allow for site authenticity, while also requiring minimal strain on the experimenter in term of procurement.

The other tool used for scalping in the experiment was a serrated metal knife. The metal knife was chosen because as metal became available, it was readily utilized in every way possible. It would serve that metal knives would become useful tools in the practice of scalping. I proposed to use a serrated tool because examples of early metal knives in the Americas show signs that they were neither perfectly smooth nor deeply serrated (Loehr, 1951). The serrated knife that I used in the experiment was an amalgam of both early knives created with imperfections or with the intent of serration and knives that have been used for a considerable amount of time. Because of the valuable nature of metal, a knife would not be tossed away if it was made with slight imperfections or received a nick over long periods of use, leaving them with knicks in the blade (Hester et al., 1976; Cobb, 2003).

The pig cadavers were either pre-decapitated with a bow saw, as was described above, or still fully articulated. Each of the tools would be used to scalp two articulated and one decapitated cadaver. The techniques I used were reflective of either the historical records or my natural “instincts.” The technique derived from the historical record consisted of placing my knee on the back of the specimen, taking my tool and making two cuts from the frontal to the occipital on either side, and then pulling the scalp off back to front. Instead of using hair for leverage, I utilized the ears. The technique based on my instincts was used as an alternate to the historical record because I felt that it would be the best way to understand how someone in the past would approach the problem of scalping. My instinctual approach was much the same as the historical approach. However, I found no need to place myself on the back of the pig, as it was not moving as one might assume an enemy trying to escape would, and my cuts were not

restrained to long, singular strokes; I used shorter, precise cuts around the skull and was not restrained in using the tool to remove connective tissue while removing the scalp.

Each of these different techniques was timed and the technique with the fastest time, the one based on instinct with aspects of the historical accounts, was carried out on the decapitated skull reserved for each of the tool types. The order of scalping was as follows:

- the historical scalping with the stone tool
- the historical scalping with the metal knife
- the stone tool on instinct
- the knife on instinct
- the decapitated skull with the stone tool and instincts
- the decapitated skull with the metal knife and instincts

This order was an important control measure to make sure I did not approach one tool type/technique as a novice and then tackle the next with much more knowledge and practice; this could have significantly skewed my results. The final method I employed was to make the first of the pig cadavers scalped with each tool type appear to have a human face, albeit someone I would consider an enemy to stay in the context of when scalping would occur. I chose the face of a vampire, because although it looked human, it was not someone or something I would be opposed to harming. This was done to accentuate the phenomenological experience of the scalping act. It is true that attempting to reproduce a phenomenological experience of past behavior is one of the most difficult aspects of experimental archaeology (Mathieu, 2002); however, I felt it was important to at least attempt to make analogy from my experiences back to that of an actual scalper.

The last part of the experimental design consisted of an analysis phase during which I was able to consider the length of time it took to scalp each pig, the resulting markings on the skull, the perceived ease of scalping with that specific technique and tool, and my overall emotional state immediately after having scalped each of the specimens, as well as after the conclusion of the experiment and then again after some time. Through this analysis I was able to make some conclusions regarding the associations between actual techniques of scalping and the historical and skeletal records, and as well as the validity of my hypothesis and predictions.

### *Possible Issues*

As part of the design of this experiment, it was important to also consider the possible confounding nature of some of the variables that I was working with. There are a series of issues associated with using frozen pig cadavers to represent humans in an experiment such as this. First, the cadavers are going to be frozen prior to the execution of the experiment. I allowed them to thaw prior to scalping, however, the fact that they were not fresh was problematic in the sense that there was be no bleeding; which reduced the internalization that I was cutting into a once living creature, and the skin could be softer or harder than it normally would be depending on how well they were thawed. Thankfully, the last issue turned out to not be a problem as the pigs were ideally thawed before the experiment began.

Next there is the issue that pigs do not have hair on their heads like humans do; the existence of hair on humans would restrict where one could scalp and could act as an aid in pulling off the scalp. However, pigs also have thicker skin on their skulls than humans; although I am dealing with relatively young pigs (so they will have reduced skin thickness), the overall thicker skin will still be easier to grab onto and pull to ease the scalp removal, much like hair would. The overall shape of the pig skull is different from humans, as is the placement of the

ears. I approached this discrepancy by using one issue to solve the other. By scalping from the forehead, around the underside of the ears I effectively removed the same amount of skin from roughly the same areas of the skull as I would have if I were scalping a human and avoiding the ears. Also, by keeping the ears as part of the scalp section to be removed, I was able to use them in the same manner as one would use hair, as a leverage device in removal.

The last issue directly related to using a pig cadaver instead of a human cadaver is how the pig's head is positioned in relation to the rest of his body. The pig head is in a straight line with the spine owing to its quadrupedal nature, whereas the human skull is at a right angle. The alignment caused slight problems with the removal of the scalp which is why I had two skulls decapitated so that I was able to position them any way I wanted. This alignment of the skull caused me to remove some excess tissue from the neck along with the scalp. This however, did not seem to affect the efficiency of a particular technique and as all subjects faced this problem; any potential discrepancies were cancelled out.

The remainder of variables I had to consider are not directly related to the anatomy or physiology of my chosen cadavers. First of all is my obvious lack of skill in scalping. However, I felt that this was relatively negligible because my skill improved over the course of the experiment. Second, I scalped pig cadavers and pigs are not humans. This likely reduce any emotional toil I may have felt for removing the scalp of a fellow human. However, this is why I proposed to make two of the cadavers appear to have a human face; any emotion I felt can be considered to be compounded when dealing with actual humans. Another issue I faced is the idea that the scalp must be removed in one piece; the scalps of enemies were often kept as trophies and only complete scalps were valuable. Yet another complication I had to deal with is my relatively small sample size; I was only able to experiment on six pig cadavers due to

financial constraints. I believe however that six was a sufficient number to answer the questions I posed and my study can be thought of as a pilot study for something more extensive in the future based upon the results of my research.

### *The Experiment*

The first pig to be scalped was a 19 lb., articulated specimen with a human-like face (Figure 5), scalped with the obsidian stone tool. It was scalped using the historical record technique of making an incision from the forehead to the back of the neck on either side of the head, and then pulling the scalp off from back to front. The total time for scalping was 3 minutes and 11 seconds. The cut through the skin on the frontal bone was the easiest part; it took more than one cut to outline the perimeter of the scalp section I wished to remove, and the actual removal of the scalp from the skull required cutting of the fibers that held the scalp to the skull as I was attempting to pry it off. There was nearly no emotional attachment between myself and the cadaver. During the act I was more focused on the act of scalping than the internalization of what I was actually doing. After I was finished, I did not feel any change in my emotional state. The scalped skull had arching marks on the forehead, and small groups of parallel lines around the sides (Figures 6, 7).

The second pig was a 19 lb., articulated cadaver with a human-like face; it was scalped with a serrated metal knife, according to the technique described in the historical records. The total time for scalping was only 2 minutes, 15 seconds, a whole minute faster than the previous specimen. The scalping of this pig was relatively easy all the way around; the cuts were deeper with each stroke, and the knife cut through the fibers attaching the scalp to the skull much quicker (Figure 8). I expressed even less attachment to what I was doing than with the first specimen and had more composure during the actual scalping. The scalping resulted in V-marks

on the forehead and parallel marks around and on top of the skull from the de-fleshing and removal of the scalp (Figure 9).

The third pig to be scalped was 16 lbs., articulated, without a human-like face, and was scalped using my instincts with the stone tool. My instincts on how to scalp consisted of making an outline of the section I wanted to remove, and then using the right ear as a hold, I removed the scalp from right to left. The scalping took 1 minute and 15 seconds. Without thinking about trying to make one continuous cut as if I were following the historical technique, the cutting of the initial perimeter line was more difficult, but the de-fleshing was much quicker. This cadaver elicited the most emotional response from me out of all of the articulated specimens; before I began scalping, I noted that this specimen was female and reacted with a verbal sign of compassion. However, after the initial attachment, there was no emotional response to what I was doing. The scalping of this cadaver created a combination of short, parallel lines along the perimeter and on top of the skull with no examples of a long singular cut (Figure 10).

The last of the articulated skulls that was scalped was 19.5 lbs. and did not have a human-like face. It was scalped using the serrated metal knife and by following my instincts surrounding scalping. The scalping took only 40 seconds; the cutting of the perimeter was easier than I found with the previous pig, but the de-fleshing and removal of the scalp was more difficult, possibly do to the size of the knife. I once again showed no emotional distress while scalping or directly after; an assistant commented that my reacting to the scalping had turned into an “enjoyable excitement.” The skeletal markings on this specimen included a V-mark on forehead, but no parallel marks anywhere on the skull (Figure 11). Another interesting thing to note would be that the cut marks on this cadaver are shallower than with the serrated knife following the historical technique.



The last two pigs that were scalped were the two decapitated specimens; they were both 18 lbs., did not have a human-like faces, and were scalped using my instincts, as this was the fastest technique identified for both tools. The decapitated head scalped with the stone tool took 1 minute, 45 seconds to scalp. Scalping in this manner was exceedingly difficult because there was nothing to brace myself on and it was hard to grasp the head while removing the scalp. I was flustered and more attached to this pig because it was “looking at me.” The only mark that could be seen was one long mark on the forehead (Figures 12, 13).

The last pig, scalped with the serrated metal knife, took only 40 seconds, but I encountered the same problems as with scalping a decapitated skull with a stone tool. Without something to brace myself on it was hard to grip the head for scalping and in effect more unneeded flesh was removed with the scalp. Like with the previous pig, I was distressed while scalping but it became a little easier even though the face appeared to still be “looking at me.” There were two marks radiating out from the forehead and a few parallel marks on the top of the skull (Figure 14).

## **Analysis of Findings**

### *Initial Assessment*

After looking at the initial results of the experiment, I was able to analyze some key aspects of scalping and compare them to the predictions I made prior to embarking on the experiment. First, I was correct in predicting that it is easier to scalp an articulated specimen than a decapitated one. This is a result of the ability to brace oneself on the back of specimen being scalped. This would suggest that scalpers would prefer to work with a full body when scalping suggesting that the cases of decapitation associated with scalping probably occurred

after the victim was scalped. Secondly, the metal knife was easier and faster to scalp with, but both were surprisingly efficient, and the added speed of the metal knife could be a result of my level of comfort with handling a knife versus a stone tool or my increased skill as time went on. The marks created by metal versus stone are indistinguishable to the naked eye, although in some cases there was slight variation in the depth of the cut. Future research could look at the microanalysis of these marks, possibly through the use of scanning electron microscopes, for more distinguishing details.

It was quicker to scalp using my instincts as opposed to following the technique outlined in the historical record. However, this fact could be a result of my increased skill as the experiment progressed and not a direct result of the difference in techniques considering that my instincts were based on similar techniques to the historical records. Moreover, the historical records seem to reflect, in the most elementary sense, the process of scalping that would produce the marks we seen in the skeletal remains. The marks produced on the skulls of the pigs during this experiment are also very similar to those found on remains deemed to be examples of scalping. This suggests that the techniques used in my experiment are reflective of those used in actual scalping acts and that the historical techniques described are analogous to the acts that created the marks on the skeletal remains.

The clusters of short, parallel lines that are seen on the skulls but not mentioned in the historical accounts are from removing the connective tissue while peeling away the scalp. It is possible that this element of the act was not conducted with adequate gesture to be observed from afar, or possibly was not considered an important enough detail to be added to the accounts. Either way, it can not be known whether the writers of the historical accounts of scalping actually saw this element of the act or not. However, my data suggests that there is a high

probability that the historical techniques produced, at the very least, a version of the clustered cut marks.

In regards to the phenomenological experience of scalping; I found that due to the positioning of the scalper behind the specimen, for the most efficiency, the face of the victim is not seen, whether it is a pig or a human. This causes very little initial emotional response to the scalping actions but the act begins to haunt scalper's thoughts as time passes; as the day went on I was plagued with thoughts of how the flesh and bone felt under my touch during the act. The nature of the act itself makes it very unlikely for any emotional attachment or response during the actual scalping; any emotional response that does occur, which is unlikely, will happen after the completion of the event or even later on in time, but will then again dissipate over time. Lastly, it would appear from my experiment that anyone can become proficient at scalping in a relatively short period of time and that any technique used is relatively fast, suggesting the ability for one to scalp even in the middle of an intense, time-sensitive situation.

#### *After Skeletonization*

The final analysis of the skulls came from studying the skulls after they had been buried for a short time, as part of a tandem research project, and skeletonized. The cut marks that were visible after all the flesh had been removed painted an interesting picture. I had expected the exact same patterning to be visible on the clean skulls as was seen on the fleshed skulls. While this was the case the majority of the time, some of the marks were not distinguishable. The cuts that could be seen when a small portion of flesh remained but not afterwards were most likely the more superficial, or shallow cuts. There was no skull that presented without any visible cut marks suggesting that even though some evidence of scalping may not make it into the

archaeological record, a scalped skull can still be identified from the evidence that does remain. The markings after skeletonization can be seen in Figures 15-20 in numerical order.

### **Conclusion**

The archaeological experiment discussed above on the techniques for scalping in the Americas should be considered a success. Through the execution of this experiment I was able to understand the mechanics, skeletal results, and emotional response associated with scalping. I found out that first hand historical accounts of how people were scalped along with subtleties associated with the act (discovered through actually scalping) accurately produce the marks we see on specimens classified as “scalped skulls.” Moreover, I learned why there are islands of parallel lines on the skull; they are the results of trying to remove the scalp, i.e. the de-fleshing and detaching of the fibers that hold the skin to the head. This is profound because often the literature on the subject postulates that these islands are the result of having to make a series of cut around the perimeter of the scalp because one cannot cut through in one stroke. I found that this is not the case when I was able to create a scalp perimeter line with very few strokes and little to no need to go over the same area twice. This result should be explored further, possibly through a similar experiment carried out on actual human cadavers. I found that both metal and stone are well suited to scalping. They are fast and efficient and with both of these tools it is relatively easy to produce one full piece of scalp.

In regards to the phenomenological experience of this experiment, I went into the experiment expecting to not be as emotionally distressed as I would be dealing with real humans, but I did expect some sort of emotional strain to occur. I was surprised to find that I had nearly no response other than a sense of excitement. I believe this is due to both the position of the

cadaver, with the face facing away from you and the intensity of the act itself; when I was scalping I was not thinking about what I was scalping or that I was in fact “scalping,” I was focused on getting a job done as quickly as possible. Later on in the day I had an internalization of what I had done that shook me a little, but it was brief and then it passed. It would seem that without considering oneself to be emotionless, it is very easy not to be emotionally drawn into the act of scalping.

The design and results of this study should be used as a template for studying scalping techniques, their skeletal marks, and their emotional results at places around the world. The analysis of the evidence from this experiment on scalping should be utilized as an example for testing the different evidence of scalping techniques in different areas of the world as well as the establishment of a database of the variety of scalping marks that can be witnessed on skulls. The research conducted in this thesis was able to strengthen current arguments about the classification of scalping societies in North America. However, future research is always beneficial and a larger scale study with different subjects may produce an array of insights into how scalping practices were carried out. While it may seem a very taboo subject in today’s world, scalping did happen and was a large part of many of the cultures that are dwindling across the United States at this very moment. Anthropology and experimental archaeology have the capabilities of developing and testing analogies about these cultures while there is still time to compare results with the oral traditions and legends being passed down. There is much to learn about past societies and as researchers, we cannot be dissuaded from exploring a topic simply because it is not considered politically correct.

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## Figures



Figure 1. A survivor of scalping (Case, 1995).

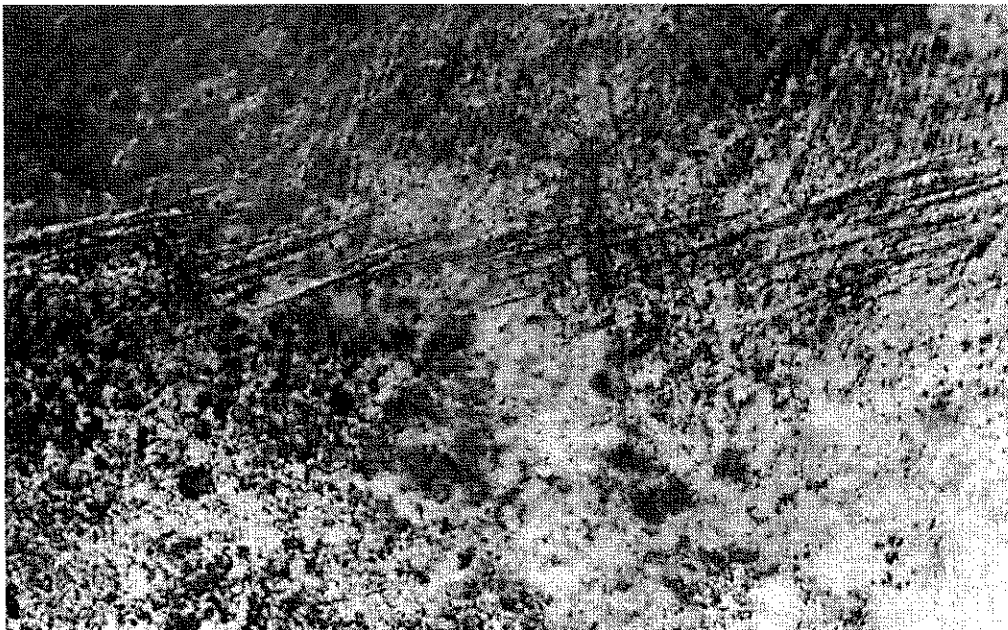


Figure 2. An example of the clusters of parallel lines on the skull (Axtell and Sturtevant, 1980)



Figure 3. The decapitation process with the bow saw prior to the experiment.



Figure 4. The stone tool and metal knife used in the experiment.



Figure 5. Example of the human-like face.

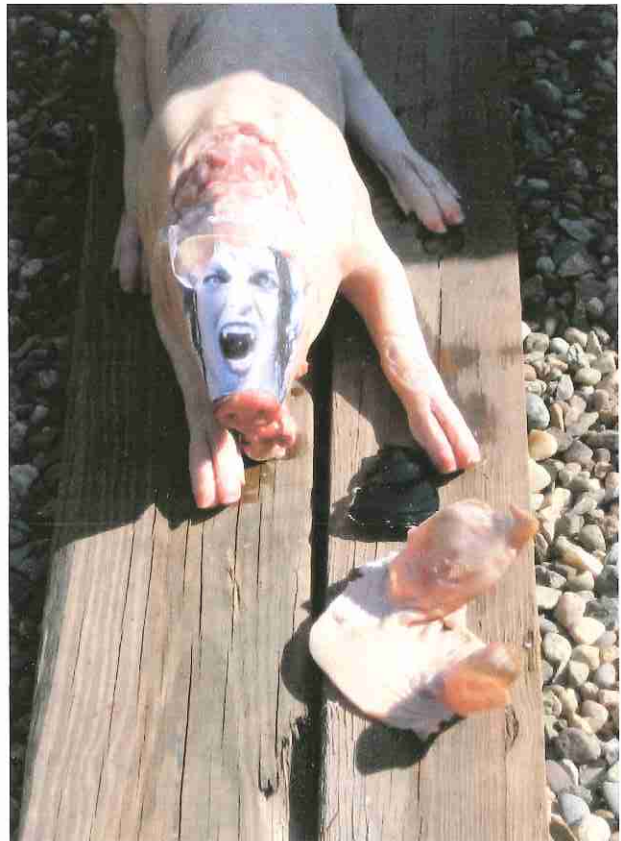


Figure 6. Pig 1 after scalping with stone tool/historical method.





Figure 7. Markings from the stone tool.

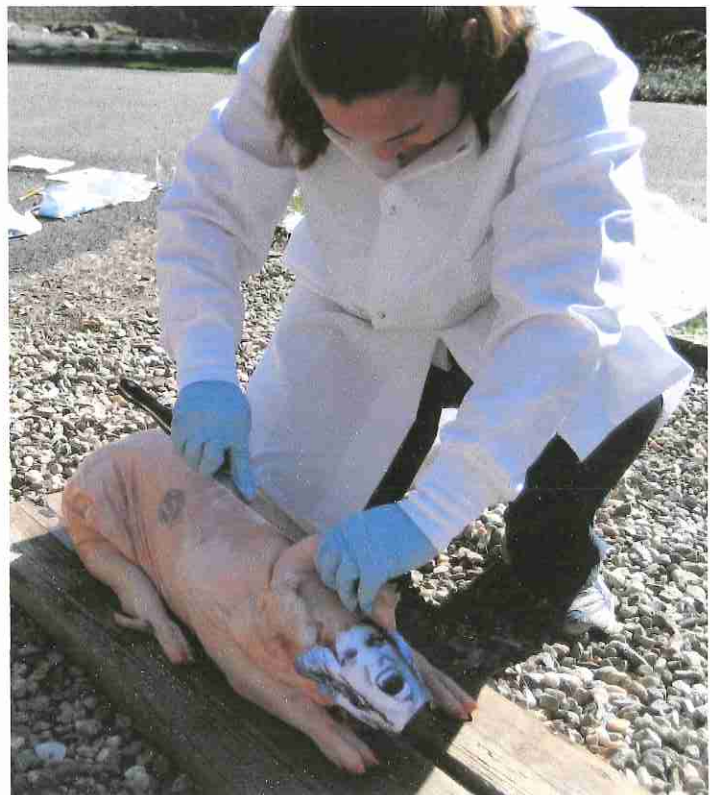


Figure 8. The de-fleshing of Pig 2.

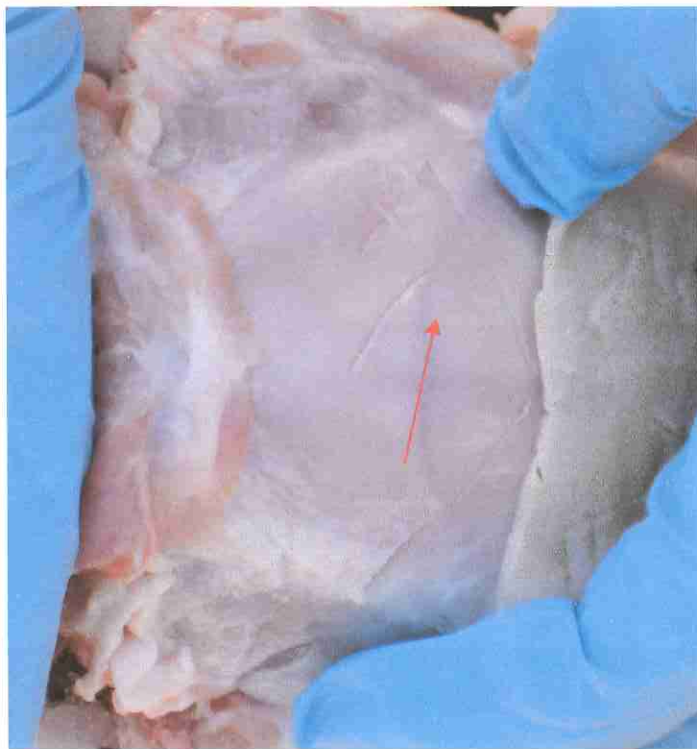


Figure 9. Cut marks on Pig 2 knife/historical.

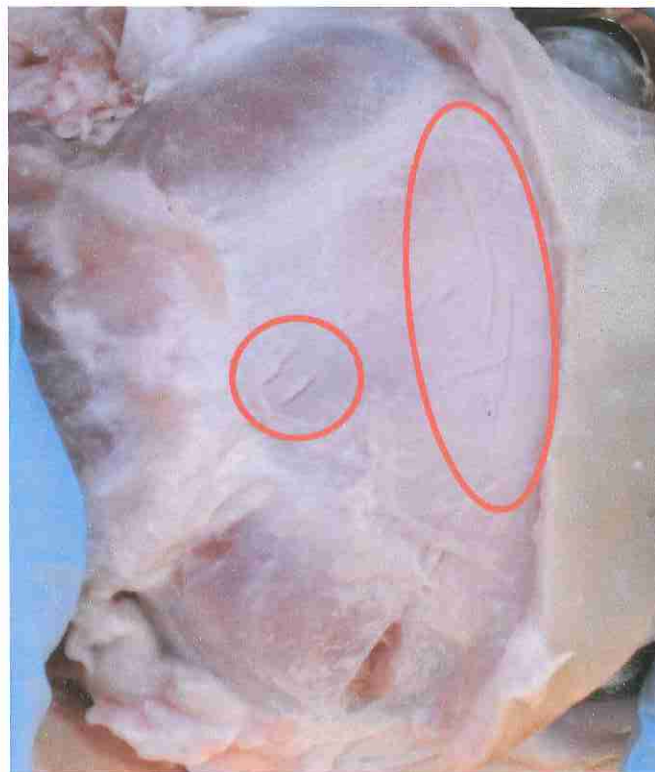


Figure 10. Cut marks on Pig 3 stone/instincts.

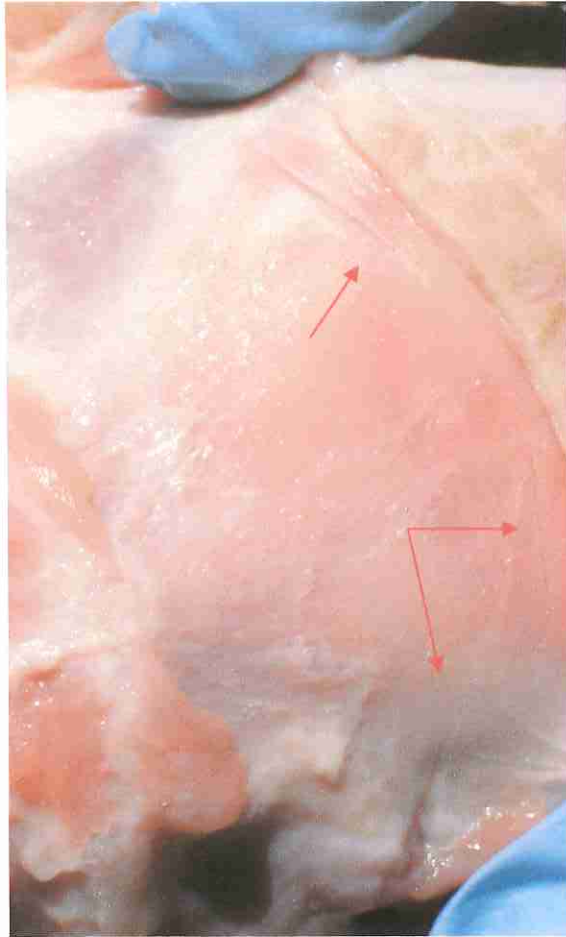


Figure 11. Cut marks on Pig 4 knife/instincts.

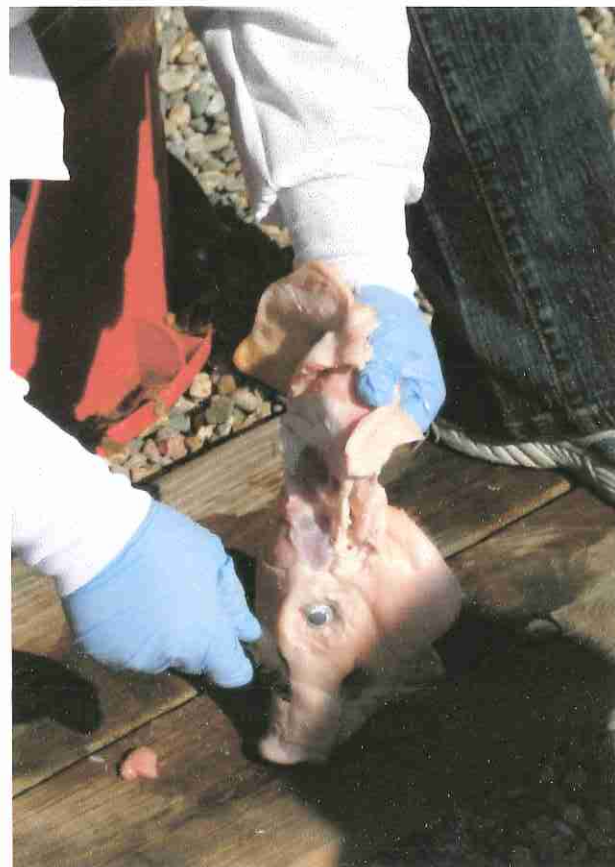


Figure 12. Pig 5, example of decapitated scalping.

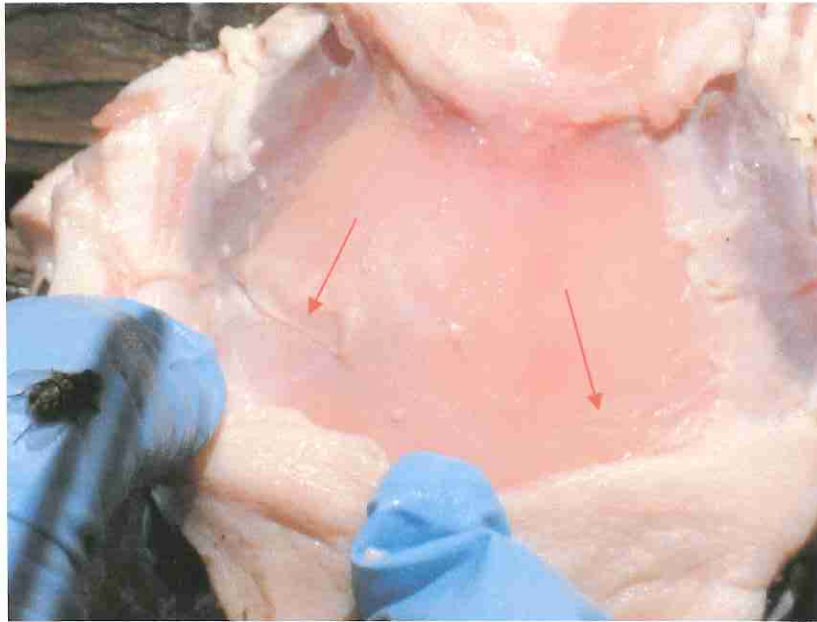


Figure 13. Cut marks on Pig 5, decapitated/stone/instincts.



Figure 14. Cut marks on Pig 6, decapitated/knife/instincts.





Figure 15. Pig 1 skull without flesh.



Figure 16. Pig 2 without flesh.





Figure 17. Cluster marks on Fig 3.



Figure 18. Shallow cut mark on Fig 4.



Figure 19. Clusters and short cuts on Fig 5.



Figure 20. Cut marks on Fig 6, part of skull missing.