CUSTER'S LAST DRAG: AN EXAMINATION OF TOBACCO USE AMONG THE SEVENTH CAVALRY DURING THE NINETEENTH CENTURY

By

Shannon Marjorie Vihlene

Bachelor of Arts, The University of Montana, 2004

Thesis

presented in partial fulfillment of the requirements
for the degree of

Master of Arts
in Anthropology, Forensic Anthropology

The University of Montana
Missoula, MT

Summer 2008

Approved by:

Dr. David A. Strobel, Dean
Graduate School

Dr. Kelly Dixon, Chair
Department of Anthropology

Dr. Ashley McKeown
Department of Anthropology

Dr. Harry Fritz
Department of History

ABSTRACT

Vihlene, Shannon, M.A., August 2008
Anthropology

Custer's Last Drag: An Examination of Tobacco Use Among the Seventh Cavalry During the Nineteenth Century

Chairperson: Dr. Kelly Dixon

Tobacco has played an integral role in global history, and there are numerous historical records related to tobacco use over the past five hundred years. The odontological evidence recovered from the Custer National Battlefield infers a high frequency of tobacco use within the Seventh Calvary, yet nineteenth century historical records fail to mention such intensive use in the Seventh Calvary. This paper will briefly discuss late nineteenth century tobacco culture and apply that to a bioarchaeological research project associated with remains from the Custer National Battlefield to addresses this contradiction between historical and physical records.

ACKNOWLEDGMENTS

An undertaking of a project of this magnitude required the insights and guidance of a great number of family, friends, and respected colleagues. First, I would like to thank my thesis Chair, Dr. Kelly Dixon, whose expertise, understanding and patience aided me in completion of my graduate degree. She provided me with direction (given at every stage of the thesis process), assistance in writing reports (i.e., proposals, scholarship applications and this thesis), and became more of a mentor and friend, than a professor. I would like to thank my thesis Committee: Dr. Ashley McKeown and Dr. Harry Fritz, for their insights and assistance. I would also like to thank Dr. Douglas Scott and Dr. P Willey for providing me with the opportunity to work with such a unique site and topic. Additionally, I would like to thank the National Park Service for the funding required to perform this study.

In addition to the technical support and assistance above, I received a large amount of support from my family and friends. My parents, Vern and Lynne Vihlene, instilled in me, from an early age, the desire to succeed and the skill required to obtain a Master's Degree. My friend and colleague, Molly Swords, provided on-going support, encouragement and editing assistance without which I would not have finished this thesis. Additionally, I would like to thank Jim Zimmerman for the support he provided and the continual affirmations that led to this projects conclusion.

Lastly, I would like to thank Marlboro Lights for keeping me awake and alert during my all night writing sprees, calming me down during times of stress, inspiring me during times of contemplation, comforting me when no one wanted to hear my disconnected ramblings about tobacco statistics, and always reminding me of my topic of choice.

PREFACE

The subculture of the military has fascinated me since I first stepped onto the Marine Corp base of Camp Pendleton in California. Growing up in Southern California meant knowing where all the best surfing beaches were, and Pendleton was one of them. Part of Marine Corp training is learning the extensive Marine Corp history, which resulted in a number of my friends reciting this history. The history and customs captivated my attention, which resulted in my attempt to enlist in the military; unfortunately, the academic world also beckoned me. My studies in Historical Archaeology have furthered my interest in early military life and its practices, which led to the development of a Master's Thesis that combines these topics. After reading about the archaeology that had taken place at the Little Bighorn Battlefield, I knew that I wanted to be a part of the research. With the help of Dr. Kelly Dixon, I contacted one of the researchers that had been involved with the Little Bighorn for some time, Dr. Doug Scott. Dr. Scott suggested that I do additional studies on the tobacco consumption of the soldiers. This sounded like an amazing opportunity to combine my interest in historical research, the military, and my knowledge of forensic anthropology, not to mention my personal affection for cigarettes. After getting the project underway, I realized that I may have bit off something more than anticipated. The project kept growing and it seemed that every time I tried to narrow the scope I would find another amazing quote. One of the great things about tobacco research is the plethora of available information dating back to the founding of this country, this also proved to complicate my research as well. Some historians can spend a lifetime researching tobacco.

TABLE OF CONTENTS

LIST OF TABLES and CHARTS

Tables **Page**

LIST OF FIGURES

Figure Page

Figure Page

Chapter 1

INTRODUCTION

Despite the extensive literature dedicated to the history (Graham 1953; Fougera 1986; Hammer 1995; Barnard 2001; Hatch 2001; Hutchins 2003) and archaeology (Scott and Fox 1987; Scott et al. 1989; Fox 1993; Barnard 1998; Scott et al. 1998) of the Battle of the Little Bighorn, there is no research dedicated to tobacco use among the Seventh Cavalry. Rather there has been an emphasis on efforts to recreate the flow of combat (Scott et al. 1989; Fox 1993), discover explanations for the tragic events through the published diaries of soldiers' accounts of the battle (Mulford 1879; Marquis 1935; Liddic 1979; Taylor 1996; Barnard 2001), and efforts to determine identities of soldiers and indications of lifestyle through osteological analysis (Scott et al. 1988; Scott and Snow 1991; Willey et al. 1996; Willey 1997; Scott and Willey 1997; Scott et al. 1998). In addition, many scholarly disciplines have studied tobacco use. Historians and medical researchers have published the bulk of literature related to the history of tobacco and the health related aspects of tobacco use (Brooks 1985; Burns 2007; Robertson et al. 1997; Sapundzhiev et al. 2003). The social sciences follow closely behind, with a combination of differing approaches, including the reformation of current tobacco policies (Conway et al. 1981; Foss 1973; Poland 2006), chronological dating techniques for archaeological sites (Oswald 1961; Harrington 1954), and ethnographic reports of tobacco use (Cook 1989; Dallal 2004; Reckner 2004). Despite all the literature dedicated to tobacco, the frequency of tobacco use during the nineteenth century is poorly documented.

This study is concerned with tobacco consumption of nineteenth century American soldiers. The project's main research questions are: How prevalent was the use of tobacco in the nineteenth century and how did that compare with tobacco use by soldiers during that era? The soldiers of the Seventh Cavalry who died in the Battle of

the Little Bighorn were chosen as a case study based on the availability of information previously obtained from archaeological excavations. The Little Bighorn battlefield produced only two identified artifacts (tin tobacco tags) relating to tobacco consumption among the soldiers of the Seventh Cavalry, which necessitated the use of another form of data related to tobacco consumption. Human remains represent the other type of archaeological data that can provide evidence of tobacco consumption through the analysis of tooth color, tooth attrition, and tooth abrasion, and therefore became the primary focus of this thesis. Data collected from previously examined human remains of the soldiers of the Seventh Cavalry reveal a high frequency of tobacco use (Scott et al. 1998). In order to determine if these skeletal remains are a representative sample of the tobacco users of the Seventh Cavalry, military historical documents, namely Army Muster Rolls, will be used to compare the frequency of tobacco use among the soldiers of the Seventh Cavalry. While such information will be used to address the research questions noted above, it is also expected to provide insight about the daily lives of the soldiers, to identify the frequency of tobacco use among nineteenth-century soldiers, and to possibly create a model for predicting the kind of physical evidence that might exist on skeletal remains of soldiers. I will integrate the historical documentation of civilian tobacco use with the historical, archaeological, and biological data associated with the Seventh Cavalry of the Battle of the Little Bighorn to address these issues and the research questions. The skeletal evidence from the Seventh Cavalry, along with studies of the predominant tobacco use among today's military, influenced a working hypothesis that the prevalence of tobacco in the military was relatively high when compared to the general public.

Tobacco consumption can be inferred through the analysis of dental staining, dental attrition, and dental groves from pipes, as well as historical documentation of tobacco sales. Fortunately, the dental remains of a few soldiers from the Battle of the Little Bighorn have been examined (Scott and Snow 1991; Scott and Willey 1997; Scott

et al. 1998) and a majority exhibit signs of tobacco staining on their teeth. The skeletal remains examined by Scott et al. (1998) represent a select sample of the soldiers who lost their lives in the Battle of the Little Bighorn. Taphonomic factors have greatly played a role in the availability of human skeletal remains available for study. The burial and reburials of the soldiers from the Battle of the Little Bighorn have resulted in disjointed and erratic availability of skeletal material. The excavations of "unnamed soldiers" from the Custer National Cemetery supply a majority of the skeletal analyses used in this study. To verify the validity of these sample observations, an analysis of non-biased historical records including, Army Muster Rolls, will be used to conduct a longitudinal study of tobacco use of all soldiers of the Seventh Cavalry during 1867-1882. In order to gain a holistic understanding of tobacco use among the soldiers of the Seventh Cavalry, I will briefly explore the ways in which tobacco has been examined in the disciplines of archaeology, bioarchaeology, anthropology and sociology.

Archaeology of Smoking

Historical archaeology is a multi-disciplinary field that shares a special relationship with the formal disciplines of Anthropology and History. This definition encompasses other definitions, presented by Orser (2004), of historical archaeology as a period of modern life and also as a method by which integrates historical documents with the archaeological record. This comprehensive definition explains the wide variety of avenues used to understand the global nature of modern life, including examinations of material remains and interpretations from historical documents. As a socially significant activity associated with colonization during the past 500 years, smoking is a worthy candidate for research in the field of historical archaeology. Yet most of the literature related to historical archaeology and tobacco use addresses the morphology of pipes and associated chronological ordering. The frequency and behavioral aspects of tobacco use tend to be neglected.

Archaeologists are limited by what is retained in the material record. The remnants of tobacco use are limited as well by the materials that can be retrieved from the ground. Clay tobacco pipes are among the most obvious of these materials. Clay pipes are abundant on historic sites and therefore are usually studied as material remnants of past tobacco use. There is extensive research available on clay pipes (e.g. Claver 1950; Dunhill 1969; Oswald 1975; Davey 1980), as well as a series of publications dedicated to the specific study of pipes, including the *Society for Clay Pipe Research Newsletter* and *Historic Clay Tobacco Pipe Studies*. Clay pipes in archaeological contexts are frequently viewed as accurate chronometric tools. Various dating techniques such as the seriated pipe bowl typology created by Oswald (1961), the pipe stem dating formula developed by Harrington (1954), and decorative motifs and maker mark analysis can all be used to delineate dates for tobacco pipes in historic artifact assemblages. These valuable dating techniques appear to have overshadowed the additional information clay pipes can provide, namely the behavioral and cultural study of tobacco use.

Detailed interpretations of the role of clay pipes is often neglected, although tobacco related archaeological evidence has been used as indicators of social class, gender, and ethnicity. For example, Cook (1989) examined the class and ethnic context of the Boot Mills Boardinghouse in Lowell, Massachusetts through clay pipe fragments. She argued that the role of pipes during the development of the nineteenth-century industrial culture should be examined as a leisure behavior and class signifier. For example, the analysis of 488 white clay pipe fragments signified that pipe impressions such as "HOME RULE" and pipe stem length could denote the class of the individual, as well as their ethnic identity. Reckner (2004) proposed that nationalist identities could be determined from clay pipes. He examined clay pipes from a late-eighteenth and nineteenth-century urban site in Paterson, New Jersey. Patriotic slogans and Irish nationalist symbols printed on the pipe bowls were used to identify the negotiation of working class Irish and Irish American identity at this New Jersey site. Reckner utilized

material culture and documentary evidence to show that smoking pipes were an active element rather than a passive by-product of ethnicity. Dallal (2004) addressed the connection between gender and clay tobacco pipes, arguing that her analysis of nearly ten thousand seventeenth and eighteenth-century clay pipe fragments from New York City's lower Manhattan reveal ways female pipe manufacturers had an effect on the pipe-making industry through makers' marks, motifs and iconographic "themes." She demonstrated that the feminine iconography imprinted on the pipes women made, such as the Tudor Rose and the Fleurs-de-lis, empowered them in a male-dominated culture as well as provided the owner with subtle national pride. The interpretive nature of the above studies is debatable, but at least the researchers sought meaningful analyses using tobacco pipes.

The material culture that is preserved in the archaeological record does produce some biases when considering historic tobacco culture; not everyone smoked from a pipe. The absence of pipes does not suggest that tobacco use was nonexistent at an archaeological site. Devotees to the plant displayed their smoking eccentricities by collecting other smoking paraphernalia besides pipes, including pipe cleaners, matches, cigar holders, cigar cases, ashtrays, pipe-lights, spills, spittoons, tobacco pouches, storage jars, snuff boxes, and pipe racks, all of which can be recovered in the archaeological record (Gilman and Xun 2004:128).

In addition to pipes, spittoons (Figure 1) represent another form of material culture that tends to preserve well in the archaeological record (Dixon 2005:120). During the nineteenth century, spittoons, or cuspidors, were found in virtually every public place, from the Halls of Congress to the rowdiest frontier saloon (Campbell 1964:97). Although spittoons were widely available, they were not easily transportable, especially for those traveling West on horseback or carriage. Many did not utilize formal spittoons, "out of doors where his life was principally led the chewer spat upon his lands without offence to other men, and his homes and public buildings were supplied with spittoons"

(Oberholtzer 1917:93). Generally the appearance of a spittoon would directly imply the use of chewing tobacco, though toward the end of the nineteenth century they were utilized for those with tuberculosis; persons with tuberculosis carried pocket spittoons with them at all times (see Appendix B) (Barnes 1995:88).

Figure 1. Brass spittoon reproduction with 7th Cavalry Arms (Original source and scale unknown).

Tin tobacco tags, which have been recovered in archaeological settings (Scott et al. 1989:196), appear to be absent from the literature associated with the archaeology of smoking. Developed in 1870 by Pierre Lorillard, these "Tin Tabs" were unique and used to identify brand names of plugs of chewing tobacco (Figure 2). The tag with brads on the edges were pushed into the brick of plug tobacco at varying intervals so that when a chunk was separated from the brick it could still be identified as a particular brand of chewing tobacco (Figure 3). Tobacco factories generally manufactured two or three different types of plug tobacco, yet offered anywhere between 40 to 120 different brands resulting in more than 12,000 different tin tags (Storino 1995:7). Tobacco companies offered prizes to customers in exchange for their brand tags, similar to the redemption of Marlboro Miles or Camel Cash today (Christen et al. 1982:827). The tin tags are quite possibly the only physical evidence of tobacco chewing behavior, with the exception of a spittoon.

Figure 2. (left) Tin tobacco tags came in a variety of shapes and sizes (Original source and scale unknown).
Figure 3. (right) Plug tobacco brand logo illustrating the use of tobacco tags (the horseshoes) placed in varying places (Original source and scale unknown).

Match safes represent another type of material culture that implies tobacco use. Friction matches were hazardous to simply carry loosely in pockets since they were combustible. Along with the invention of the friction match, came the invention of a fireproof container called the match safe (Figure 4) (also called match case, match pockets, and match receivers) in 1830 (Sullivan 1978:16). These decorative items, sometimes referred to as jewelry, were constructed of every conceivable material. Some were quite elegant with inlaid shell or enameled gold and silver created by artisans such as Karl Fabergé, while others were strictly utilitarian celluloid-sheathed tin cases usually given away due to their low-cost to manufacture. Match safes fell out of fashion around 1930 as a result of the invention of the safety match (Koenig 2000a, 2000b). While the appearance of a match safe would not directly correspond with smoking, it could be used by archaeologists as one of several lines of evidence of smoking.

Figure 4. Match Safes: two match-themed cases, one featuring a lighted cigar (Source: Koenig 2000b:2, scale unknown).

There are a variety of other material objects associated with tobacco consumption. For example, there were many accoutrements that went along with the use of snuff tobacco like snuff boxes, snuff spoons, and snuff brushes to brush the powder from the upper lip. The use of snuff had, for the most part, fallen out of vogue by the nineteenth century, so a discussion of materials associated with snuff use will not be included here. See Curtis (1935) for additional information on such objects.

Some smoking devices were made of perishable materials (Von Gernet 1995:68). Cigars were considered fashionable and were frequently smoked when they could be procured. Cigarettes began to appear by the mid-nineteenth century, although they were quite costly compared to other forms of tobacco and were available mostly to urban populations in the United States (Robert 1967). The first successful machine-rolled cigarette was made available in 1881, making the cigarette more accessible (Routh et al. 1998:543). These methods of smoking do not endure in the archaeological record, which has resulted in a bias against such ephemeral remnants of historic tobacco use.

While archaeological remains can help interpret the culture and history of tobacco use, rarely do the topics of who was smoking or why come up when a pipe stem is discovered on an archaeological site. Recent advances in DNA analysis may inspire more research related to who was smoking pipes recovered from archaeological sites. For example, recent experiments with ancient DNA on pipe stems (e.g., Dixon 2006)

found evidence of female DNA on a tobacco pipe stem with teeth clench marks. Human skeletal remains can also supply direct evidence of an individual's tobacco use, as discussed below.

Bioarchaeology

Bioarchaeology offers a unique perspective of past human behavior with the analysis of human biology as interpreted from skeletal remains (Larsen 1997:4). Disease, injury, cause of death, diet, and physical activity can all be gleaned from human remains. Intentional or accidental skeletal alterations, such as cranial deformation, foot binding, and occupational-related activities (like work-related kneeling or regular horseback riding) provide direct evidence of cultural behavior. C. Peebles summarizes this quality: "A human burial contains more anthropological information per cubic meter of deposit than any other type of archaeological feature" (Peebles 1977:124). The goal of Bioarchaeology is to integrate this biological information with the cultural information to create a comprehensive interpretation of past peoples. One approach to this goal is through the analysis of dentition.

Teeth provide direct evidence of cultural significance through their intentional or unintentional alterations (Milner and Larsen 1991:357). These alterations, as discussed by Milner and Larsen (1991), include intentional filing, chipping, decoration with inlays, removal, and ante-mortem drilling, as well as unintentional wear caused by the use of teeth as tools, tooth fractures, trauma related tooth loss, and unusual abrasion patterns. Although this information can provide significant data of past human behavior, there are few examples of this information being utilized and analyzed. The study of unusual abrasion patterns on teeth can provide evidence of tobacco use. Pipe smoking can produce a distinctive wear pattern on teeth when the habit is long-standing and there is consistent placement of the pipe (Figure 5). The abrasive clay of most tobacco pipes causes a hardening and polishing of the exposed dentine. The ellipsoid shape of the

mouthpiece causes an elliptical opening in the occlusal plane (Morris 1988:361). Dental literature (Burket 1961; Davies 1963; Robertson, 1997) briefly addresses this type of tooth wear, although very little is published with reference to pipe wear of excavated skeletal material.

Figure 5. Dentition showing smooth concave abrasions, the result of clay-pipe smoking (Source: Anderson 2002:2).

Pipe smoking gained a great deal of popularity during the sixteenth through the nineteenth centuries. While this prominence is insignificantly represented in scholarly literature, with few examples of human dental alterations resulting from pipe smoking (Morris 1988; Ubelaker 1996), a notable exception comes from a seventeenth to nineteenth-century slave graveyard in Barbados. Handler and Lange (1978) and Corruccini et al. (1982) reported that the Newton plantation in Barbados provided evidence of twenty-five individuals possessing dental abrasions caused by habitual pipe clenching. Whole clay pipes were recovered from associated grave goods as well as pipe fragments in the associated burial fill, creating a direct link between the individuals and the pipes. In another example, Ubelaker (1996) reported seven individuals with evidence

of pipe wear in his study of 19 plantation workers from a seventeenth-century archaeological site in Patuxent Point, Maryland. These colonial-period dental remains exhibit pipe abrasions on both left and right sides and are an example of extreme unintentional alteration. In addition, Kvaal and Derry (1996) report that dental abrasions caused by pipe smoking were also discovered in individuals from a Norwegian churchyard of the Christiania House of Correction. The House of Correction served as a prison from 1748 to the twentieth century. Skeletal remains of 107 unidentified individuals were collected and 91 individuals had preserved maxillae and/or mandibles available for study. Both sexes exhibited tobacco pipe abrasion marks (25% of the males and 28.5% of the females). Finally, Sledzik and Moore-Jansen (1991) studied the dental health of three U.S. military skeletal samples from the War of 1812 (1812-1814), the Civil War (1861-1865), and the Indian Wars (1870-1899). Four individuals had artificial wear facets: one Snake Hill (War of 1812) soldier; one Civil War soldier; and two soldiers from the Indian Wars. Two of these individuals with wear facets also had dark brown stains on the lingual surfaces of the teeth, providing various lines of bioarchaeological evidence suggestive of tobacco use (Sledzik et al. 1991:218).

Discoloration of teeth may provide another line of evidence related to tobacco use (Figure 6). "A dark brown to black discolouration of the cervical margins of teeth caused by tar and other by-products of combustion is commonly associated with smoking" (Mirbod and Ahing 2000:252). Due to high temperatures, tobacco smoke causes thermal irritation to teeth. Pipe-smokers aggravate this by adding the temperature of the heated pipestem. The irritation from the heat can cause staining of the teeth known as extrinsic discoloration (Davies 1963:217). Another tobacco-related extrinsic stain could be caused by the retention of polyphenolic compounds, which provide the color in foodstuffs like smokeless tobacco (Eriksen and Nårdbø 1978; Robertson et al. 1997; Watts and Addy 2001). Some individuals are more susceptible to tooth staining for a variety of reasons. "The local factors that favour deposits on the teeth are roughness of the enamel surface,

irregularity of the teeth which results in some of the surfaces not being subjected to the friction of food in mastication, and lack of oral hygiene including non-use of the tooth-brush" (Stones et al. 1966:511).

Figure 6. Pronounced tobacco stains on lower incisors (Source: Mirbod 2000:253).

There are few examples of tobacco use indicated by tooth staining in historical bioarchaeological contexts. The lack of noted specimens with tobacco staining may be a result of the challenges related to identifying such discoloration. Watts and Addy (2001) claimed, "The aesthetic aspects of tooth colour are difficult to quantify and colour perception is highly subjective and prone to individual variation," and they go on to suggest that the use of a Muncell color chart may alleviate the subjectiveness of color identification (Watts and Addy 2001:309). Even with the difficulty in identification, there are a few examples of possible tobacco staining in historical human remains. Ferguson (1993) suggested that at least two cases from a nineteenth-century cemetery in New Mexico had discoloration that may be the result of chewing tobacco due to its localized pattern (Ferguson 1993:V-42). Good (1986) noted the presence of teeth with both staining and occlusal wear in individuals from a nineteenth-century cemetery in Kansas (Good 1986:123).

Habitual chewing of tobacco can cause dental attrition, the mechanical wearing down of the surface of teeth (Stones et al. 1966:257). "Abrasion from smokeless tobacco usually occurs on the vestibular surface opposite the wad of smokeless tobacco, but may involve the occlusal surfaces if the tobacco is chewed (Figure 7)" (Mirbod 2000:252).

The presence of gritty impurities, such as sand with the tobacco leaf, causes attrition that is occasionally found in more modern times (Burket 1961; Bowles et al. 1995).

Figure 7. Dental attrition in a chronic user of smokeless tobacco (Source: Bowles et al. 1995:328).

Bioarchaeology has the potential to significantly contribute to the study of historical tobacco use through the analysis of tooth color, tooth attrition and tooth abrasion in historic skeletal samples. While the human remains and artifacts associated with smoking are helpful in understanding general smoking behavior over time, they do not provide an adequate answer to my research question pertaining to the prevalence of tobacco use by U.S. Soldiers during the nineteenth century. These assemblages do not directly infer the number of participants, the frequency of the act of smoking, or the types of individuals that participated in tobacco consumption. In response to this lack of information, I have sought a broader scope of literature and investigated anthropological and sociological sources related to the topic of tobacco use.

Anthropology

Although anthropologists have occasionally given attention to tobacco use, they have rarely emphasized the significance of this plant's universal appeal. Laufer (1924a, 1924b, 1930) and others (Ozanne 1969; Von Gernet 2000; Gilman and Xun 2004) have extensively recorded the introduction of tobacco throughout the world. In addition studies have addressed the power of tobacco's ability to maintain ethnic differences

(Golomb 1979) and have examined the mythology associated with tobacco (Levi-Strauss 1973).

Anthropologists have also been studying the ethnic differences correlated to tobacco use and attitudes toward tobacco. Peter Black (1984) examined the socio-cultural ecology of tobacco use. His study of the Tobi of Micronesia investigated the incorporation of tobacco within "people's socially constructed and maintained symbolic and moral worlds" (Black 1984:479). Black found that many of the behaviors of Tobian people revolved around tobacco and its acquisition. In his conclusion, Black outlined numerous avenues of study to further research of tobacco use, including the psychobiological response to the ingestion of tobacco and the psychological correlates of the act of smoking. Further studies of the ethnic differences between populations within the United States have been conducted as well. Page and Evans (2003) recorded direct observations of tobacco use and interviewed African American youth ages 11 to 15 years old and found the use of cigarillos called "Black & Mild" was preferred due to its high nicotine content which is between five and twelve time the nicotine found in cigarettes. Sawatsku et al. (2007) examined the smoking rates between Asian and white/Caucasian youth to determine if the differences in tobacco use could be explained by personal and social factors. Historical surveys of tobacco use have been examined as well. Stolberg (2007) reviewed the behaviors and perspectives of tobacco use in diverse historical and cultural contexts revealing considerable ethnic variation in tobacco use and attitudes toward tobacco itself. These are just a few of the examples of tobacco related literature within the field of anthropology.

Anthropological research on the topic of historical tobacco use is limited to a select number of studies. Many anthropological studies can overlap and cross the imaginary boundaries between the social science disciplines; for example often the topic of cultural or ethnic differences span across both disciplines of anthropology and sociology. Therefore, the scarcity of historical tobacco related literature within

Anthropology has guided my research to a closely related discipline, Sociology. Sociology provides additional scholarly context related to my research objectives.

Sociology

Sociological research aids in formulating public policy and resolving social problems, as in the case of tobacco. Sociological tobacco research has therefore examined possible causes of smoking and attempted to modify smoking behavior. The literature in Sociology is rich in comparison with Anthropology and Bioarchaeology. Some of the topics relating to possible causes include demography, lifestyle model(s), and effects of peer and/or media social influences on smokers (Poland et al. 2006:62). Foss (1973) discussed internal vs. external personality characteristics as a means of explaining smoking behavior. Foss found that "reference groups and situations social influence" were important influences on smoking, concluding that there is such a thing as a "social" smoker vs. a "psychological need" smoker (Foss 1973:283).

Poland et al. (2006) investigated the social context surrounding tobacco use and examined how context can be applied to tobacco control. They noted that investigating individual behavior and attitudes of those who smoke, rather than the socio-spatial differences in smoking, has held back tobacco control efforts (Poland et al. 2006:59). The importance of what a smoker thinks, feels, and needs are critical aspects of tobacco control, but Poland expressed a need to further the research via social context.

In another Sociological study, Conway et al. (1981) examined the impact of occupational stress on tobacco, coffee, and alcohol consumption. A longitudinal field study of 34 U.S. Navy petty officers measured substance consumption in relation to subjective stress indicators. Conway et al. found that "habitual cigarette smoking and coffee drinking were positively associated with chronic tendencies to perceive high stress" (Conway et al. 1981:155).

These are but a few examples of the rich sociological literature available on the topic of tobacco use. The formation of public policy and concerns for contemporary and future population health has driven Sociologists to investigate tobacco use. The sociological research among modern societies has provided a detailed explanation of why people choose to indulge in tobacco products. These reasons for tobacco consumption are possibly the same reasons that populations would have used tobacco during the nineteenth century, although there were no parallels between today's society and the nineteenth century.

Summary

While the field of Sociology has concentrated on the smoking behavior of contemporary culture, sociologists have generally neglected topics related to the history of smoking. Anthropologists on the other hand, have focused their attention on ethnographic accounts of American Indian use of tobacco, ethno-historic studies of tobacco use around the world, as well as tobacco use as it relates to ethnicity. Yet, anthropologists have excluded American tobacco use in the historic period. Bioarchaeological analyses have identified people's smoking habits through skeletal remains dating from the recent past, but these studies have not addressed the culture and role(s) of tobacco use among these subjects. Lastly, archaeologists use material culture, such as pipes, to date archaeological sites and to describe the role pipes played in certain communities. Even so, the archaeological investigations have not integrated the history of tobacco use into analyses of tobacco culture(s). This thesis research aims to contribute to the diverse array of literature on tobacco use by presenting a holistic analysis of tobacco use among nineteenth-century American military personnel/enlisted men. The next chapter is dedicated to presenting a context for this study by discussing the history of tobacco use.

Chapter 2

Tobacco, I do assert… is the most soothing, sovereign and precious weed that ever our dear old mother Earth tendered to the use of man! Let him who could contradict that most mild, but sincere and enthusiastic assertion, look to his undertaker…

Ben Jonson in *The Alchemist*

HISTORY OF TOBACCO

Tobacco Use through the Centuries

During the five centuries since its first historical documentation, tobacco has been chronicled and used by citizens of many nations. Tobacco's global interest is unique in that no other herb has inspired societies to so quickly adopt it as a vice. It has been considered a remedy for all ailments, an inspiration for writers, and most importantly as a form of worldwide currency (Brooks 1952; Burns 2007; Corti 1931; Gately 2001).

Tobacco has been used by humans as far back as 18,000 years ago and was first cultivated between 5,000 and 7,000 years ago (Burns 2007:4). Asiatic immigrants to South America first cultivated tobacco and incorporated the tobacco plant into their vast herbal knowledge, but they did not attach the meanings to it and ritualize its use as the later inhabitants of the Americas (Gately 2001:3). Some 1500 years ago virtually all the tribes of the Americas incorporated tobacco in some form into medicinal practices and their religion (Burns 2007:5).

According to an ancient North American Indian myth, after a long famine, the Huron Indians prayed to the Great Spirit for help. A woman was sent to save the people. She sat on the dry land, wherever her right hand touched the soil, potatoes grew; corn

grew where she placed her left hand. When the land was fertile she sat and rested. When she rose to her feet, there grew tobacco (Koskowski 1955:39). Ethnologists and folklorists (Kell 1965) found this to be one of several comparable myths about tobacco's origins, although no two North American tribes exactly agree on the details.

Even though tobacco is native to the Americas (Burns 2007:4), the "discovery" of tobacco has been claimed by several cultures throughout the world (Von Gernet 1995:80). Some historians believe that the ancient Romans, as well as Europeans in the Middle Ages, smoked tobacco pipes, although there is no reference to tobacco in ancient texts (Corti 1932:25). Archaeologists have discovered pipes in ancient Greek, Roman, Turkish, Irish, English, and Danish sites, but these pipes were not used for tobacco. Europeans had been inhaling the smoke of coltsfoot, dried cow dung, and other dried herbs for medicinal purposes for centuries before European contact with people in the Americas. In all likelihood, the practice of tobacco smoking originated in areas where the tobacco plant originally grew, the westerly regions of Central and sub-tropical South America; these environs have the ideal climate for this sub-tropical plant (Corti 1932:26).

The history of pre-European contact tobacco use was skewed by European observers. The documentation of the American Indian aboriginal societies was interpreted purely in terms of a eurocentric bias (Kell 1965:99). As a result, many of the true meanings behind the medicinal and spiritual uses of tobacco were erroneously interpreted and therefore remain unknown and impossible to compare to later uses and meanings of tobacco in historical periods. (Kell 1965:99). The valuable trade and diplomatic value of tobacco, however, has been documented (Van Lancker 1977:230).

On his first voyage to the New World, Christopher Columbus was offered "strange dry leaves" on numerous occasions as tokens of friendship. Not realizing their purpose or value, Columbus threw the leaves overboard (Gately 2001:23). The purpose of these leaves was not known until two of his crew observed San Salvador (Cuba) natives who "drank smoke." The two, Rodrigo de Jerez and Luis de Torres, tried the

custom of inhaling the dried leaf smoke, making them the first known Europeans to smoke tobacco. Jerez and Torres reported that the natives prepared the tobacco "in a manner of a musket formed of paper," with the dried tobacco leaves wrapped in palm or maize. One end of the leaf wrap was light and smoke was drank from the other end (Brooks 1932:14). Jerez reportedly became a habitual smoker while in the New World. Upon return to Spain, his Indian-fashion use of the leaf landed him in prison by the Inquisition due to tobacco's association with heathen rituals. By the time Jerez was released, smoking was a Spanish craze (Campbell 1964:93). The craze over tobacco consumption escalated during the following centuries. Due to the subsequent complexities, the history of tobacco use is organized according to century.

Tobacco Use in the Sixteenth Century

By the sixteenth century Columbus' discovery of tobacco had made its way across the Atlantic to the European continent (Campbell 1964:94). European sailors returning from the New World facilitated the diffusion of tobacco through Europe. Undoubtedly, these sailors introduced seaport residents and other sailors to smoking (Von Gernet 1995:75). Sir John Hawkins aided the diffusion of tobacco beyond the seaports of England in 1565, delivering tobacco seeds to that country. Sir Walter Raleigh appears to be the first to introduce the act of smoking to England in 1565 (Apperson 1914:15; Koskowski 1955:57). While smoking, Raleigh is quoted as saying "we are to-day lighting a candle in England which by God's blessing will never be put out!" (Apperson 1914:15).

There was little enthusiasm over the "savage" weed at first. Coffee, chocolate and potatoes were introduced during this time period and had captured the attention of most of English society. In 1586, tobacco eventually became fashionable through the praise of English colonists returning from Virginia and partly due to Sir Walter Raleigh, who was himself a smoker. Raleigh supposedly smoked one or two pipes immediately

prior to his execution in the Tower of London (Apperson 1914:16; Corti 1932:91; Koskowski 1955:58).

Tobacco related illnesses are common knowledge in today's society, but ironically, the Europeans accepted tobacco as a universal remedy, believing it could cure cancer, headaches, coughs, and asthma. During the fifteenth and sixteenth centuries, the theory of humours was among popular belief. This medical paradigm, based on four elements (air, fire, earth and water), involved balancing elements within the body. The four elements manifested in combinations of moist, hot, dry and cold which corresponded to the four seasons of the year. Sickness was believed to result from an imbalance of these basic properties. Smoking seemed to fit into this scheme since it seemed to dry out unnecessary "humours", which reestablished balance (Kell 1965:102). Elderly people in England were told that smoking would not benefit their being due to the fact that they were naturally dried up (Kell 1965:104).

During the sixteenth century, physicians treated virtually any ailment with tobacco that was crushed into powders, drunk with teas, wrapped around wounds, and stuffed in every orifice of the body (Kuntz 1997:18). In 1565, Nicolas Monardes, a doctor of Seville, published these medicinal properties in a pamphlet entitled *Joyfull Newes Out of the Newe Founde Worlde* that attested to tobacco's ability to clean and invigorate the human brain. Monardes indicated that tobacco could effectively cure any internal organ ailment, bad breath, kidney stones, tapeworms, and toothache. The publication was so well received that it was translated into Latin, English, French, and Italian (Gately 2001:40). Even the clergy embraced tobacco's curative properties. It was said that when smoke entered the brain it would depress the senses thereby helping maintain chastity (Kell 1965:104; Von Gernet 1995:76). The regular use of tobacco resulted in widespread addiction and abuse, contrary to its intended purpose of upholding a healthy and moral lifestyle (Kell 1965:104; Von Gernet 1995:76).

In 1664, the outbreak of the plague in London helped bolster the popularity of tobacco use. The plague claimed over 75,000 people in London during its two-year torment. Doctors attested that a steady smoker was less likely to be infected than others (Corti 1932:89). The fumigation properties of tobacco were used to cleanse the air and choked, suppressed, and dispersed any "venomous vapour" that lingered about them (Kell 1965:105-106). The use of snuff and the pipe helped to overpower the stench of decaying bodies and was smoked or snuffed regularly by the men who worked the dead carts (Christen et al. 1982:823).

Tobacco Use in the Seventeenth Century

After being part of the European society for over 100 years, tobacco became associated with two dichotomous schools of thought. There were those who believed that the devil had given tobacco to the American Indians to create deceptive hallucinations. This connection between the New World and the misleading nature of the plant prompted some English to meet tobacco use with resistance and controversy. The most well known opposition to tobacco was printed in 1604 and titled *A Counterblaste to Tobacco,* by King James I. In it he described tobacco as "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black stinking fume thereof, nearest resembling the horrible Stygian smoke of the pit that is bottomless" (Brooks 1952:71). King James I presented arguments against the unwarranted claims of those in the medical field, asking whether anyone had ever seen a single remedy prove effective against all diseases (Corti 1932:86). The most poignant remark was that tobacco was first used by savages and therefore was not suitable for civilized men to adopt their customs (Corti 1932:86). The English people's outrageously extravagant indulgences related to tobacco use led the King to claim that tobacco was an addictive substance:

> Thus having, as I trust, sufficiently answered the most principle arguments that are used in defense of this vile custom, it rests only to inform you what sins and vanities you commit in the filthy abuse thereof. First, are

> you not guilty of sinful and shameful lust? (for lust may be as well in any of the senses as feeling) that although you are troubled with no disease, but in perfect health, yet can you neither be merry at an Ordinary, nor lascivious in the brothels, if you lack Tobacco to provoke your appetite to any of those sorts of recreation…? (Brooks 1932:71).

James attested that smokers compare to alcoholics, who start slowly and are eventually beguiled and entrapped by their vice (Gately 2001:68). The King was not a popular ruler, however, and his *Counterblaste* fell on deaf ears.

The opposing school of thought, that tobacco was a gift from God sent to take away the pain and suffering of humans, was presented by influential physicians and herbalists. A Scotsman, Dr. William Barclay, was among these noted physicians. In 1614, Barclay published *Nepthenes, or the Virtues of Tobacco* in response to King James' *Counterblaste*. Barclay claimed "God honoured America and blessed it by this wonderful and sacred plant" (Penn 1901:223; Von Gernet 1995:77; Gately 2001:100).

Despite the difference of opinion, tobacco gained legitimacy as a valuable commodity of recreation, pleasure, and relaxation, resulting in a need for increased production and importation (Routh et al. 1998:544). The Spanish and Portuguese monopolized commercial cultivation of tobacco during the later part of the sixteenth century, trading in India, China, and Japan (Routh et al. 1998:542). The popularity of the pipe among the middle and working class forced European elite to find a form of consumption that would set them apart from the other classes. European elite in turn indulged in the pleasures of snuff or powdered tobacco so much that the demand exceeded its supply. Snuff became an expensive luxury that, for some, had become more important than food (Brooks 1932:51). The price of tobacco equaled its weight in silver shillings equivalent to approximately $3 an ounce today (Campbell 1964:95). The demand for tobacco elicited a need for less expensive means of acquisition. The new colonies in America considered this need to be their saving grace because the colonies came to depend on the crop as a commodity for export (Corti 1932:92; Gately 2001:69).

The Jamestown colonists experienced significant hardship and most colonists died from starvation, disease, and conflicts with the Indians within a year of their 1607 arrival in the New World. However, in 1612, John Rolfe imported seeds from Trinidad that would become the economic salvation of the colonies (Corti 1932:92; Gately 2001:70). Prior to Rolfe's success in the cultivation of tobacco within the colonies, tobacco had exclusively been grown in sub-tropical areas of the world. "The discovery that tobacco could be successfully grown and profitably sold was the most momentous single fact in the fist century of settlement on the Chesapeake Bay…Tobacco had guaranteed that the Jamestown experiment would not fail" (Gately 2001:72). Every available clearing was transformed into tobacco plantations. The governor complained that the colonists were feverishly "rooting in the ground about tobacco like swine" instead of maintaining corn and wheat crops (Von Gernet 1995:78). Over the years the Virginians perfected their curing techniques and soon surpassed the Spanish tobacco supply. England imported 60,000 pounds of tobacco from the colonies in 1622. This amount was far surpassed in 1627 with an export amount of 500,000 pounds (Gately 2001:72). Tobacco dominated the colonial life of Virginia (Brooks 1932:92). The plant had transformed itself into the alternative basis of currency. Women, an important commodity to the early settlers, began arriving in 1621. Prospective wives were purchased and sent overseas for 120 pounds of their best leaf. Even ministers were often paid with the very best Virginian leaf (Brooks 1932:93).

The English were not among the only ones embracing tobacco. The Portuguese, Dutch, Italian, and English sailors had circled the globe with American tobacco so that tobacco was known across the globe, with the exception of Australia, by the early seventeenth century (Hatch 1942:106). In addition, Africans adopted the habit with eagerness (Gately 2001:59). The Portuguese brought tobacco to West Africa during the fifteenth century, although the earliest documentation of tobacco smoking in Africa was noted in 1607 by W. Finch. European explorers of the seventeenth century commented

that the African natives had a "greedy appetite for smoke," men, women, and children alike. They sold land, cattle, and other valuables for tobacco and smoke dry dung of elephant or rhinoceros during tobacco shortages (Brooks 1932:34; Koskowski 1955:43). This demand for tobacco ultimately led to their own people being purchased with tobacco (Gately 2001:64).

Tobacco Use in the Eighteenth Century

Tobacco had become a substance that was used with increasing frequency during the seventeenth century throughout the world, and by the eighteenth century it became an integral part of worldwide popular culture, as well as a class signifier. The high society of Europe adopted snuff as its favored mode of consumption. A British author of the time wrote, "In England, especially among the decent and superior classes, there are fewer inveterate smokers than constant snuff takers" (Brooks 1932:147). With the popularity of snuff came paraphernalia and additional articles displaying status:

> In order to snuff properly, one must have owned not only an ornately decorated and minutely detailed box, but a wooden grater with a trough at one end to catch the snuff, a pin to clear the holes of the grater, a rake for separating the snuff, a spoon for taking the snuff, and a rabbit's foot to dust the upper lip (Kuntz 1997:28).

The American colonists, on the other hand, were pipe smokers and plug tobacco chewers. The safe strike match had yet to be invented which meant considerable work to light a pipe, so smoking was generally limited to leisure time.

Tobacco continued to be an alternate form of currency in the colonies and played a fundamental role in the American Revolution, also referred to as "The Tobacco War." Tobacco growers along the Chesapeake were unfailingly in debt to the British merchants and owed millions of pounds to the mercantile houses by 1776. The importers imposed legislative action which required the growers to pay freight, duties, and other charges, comply with market value of tobacco, which frequently fluctuated, and at times wait two

years for payment. With all these stipulations, the grower was invariably in debt to the import merchants (Brooks 1952:160). Thomas Jefferson was among the debtor class and by the time of the War of Independence was indebt 9000 pounds sterling. The details of his contract with the merchants proved that the debt would likely never end. Jefferson explained the "particulars of trade:" "These debts had become hereditary from father to son, for many generations, so that the planters were a species of property, annexed to certain mercantile houses of London" (Brooks 1952:160).

England, in an effort to pay for the Seven Years War, imposed new taxes on the colonies. While these taxes were significantly less than those imposed on the subjects of Britain, the colonists objected to the principle of the taxes (Gately 2001:137). Desiring a freethinking society based on the principles of the Great Awakening religious revival, the colonists began drafting their ideas of self-government. The result was The Declaration of Independence, the confluence of a belief in God and tobacco interests (Gately 2001:140). The English, believing the colonies to be children of the homeland, set out to correct their deviant behavior. The colonists financed their war efforts against the English through loans of tobacco to France. Five million pounds of tobacco acted as collateral, therefore proving tobacco to be both the cause of the war and ultimately the means by which they gained independence (Gately 2001:142). With the basis and financing of the war being tobacco, George Washington called to his countrymen "I say if you can't send money, send tobacco" (Campbell 1964:95).

Following the War of Independence, tobacco became more than a crop of profit and a currency; tobacco became a way of life for both the growers and the smokers. Tobacco was a form of income, a means of recreation, and a producer of relaxation (Burns 2007:79). As Burns (2007) so eloquently stated:

> It was a tonic at the start of the day and a tool of reflection at the end. Tobacco shaped a person's ideas and attitudes; it influenced his choice of friends and his style of speaking and the allocation of his time. As the first successful American export, as well as a prized personal possession, it

> gave a clearer purpose to the seasons than they had ever had before. This was not corn, not wheat, not barley, not anything so common. This was tobacco, brown gold, and the weeks of planting and harvesting and curing became the events around which all others in the community revolved. At this stage in America's growth, it was the tobacco plant, not the bald eagle, that would have been the more fitting symbol of the colonial experience (Burns 2007:79).

The growers were exporting less overseas following the American Revolution due to British embargoes, which meant there was more tobacco than ever for domestic consumption. The war's emotional toll resulted in a great number of colonists picking up the habit to sooth the mind, especially among the men in combat. Tobacco had become intertwined with the everyday occurrences of the colonies. The people were smoking when forming new towns, while relaxing on the porch, and signing The Declaration of Independence.

Tobacco Use in the Nineteenth Century

The popular modes of tobacco consumption during the nineteenth century transitioned from snuff, smoking pipes, and chewing tobacco to cigars and cigarettes (Burnham 1993:88). Snuff sales in Europe declined largely due to the intolerance for dripping noses, stained handkerchiefs, and wasteful moments associated with its use. The act of taking snuff became the byproduct of the desire to possess the accoutrements associated with snuff. These items were the forefront of the time consuming ritual of snuffing. Additionally, the follow up to using snuff was time consuming as well: "two entire years of the snuff-taker's life will be dedicated to tickling the nose, and two more to blowing it" (Burns 2007:123). Europeans again adopted smoking but this time in the form of cigars from the Spanish.

Americans, who had never whole-heartedly adopted the snuff habit, transitioned from pipe smoking to chewing tobacco. Similar to the European elite wanting to distinguish themselves from the lower classes, Americans wished to separate themselves

from the snobbery associated with their former homeland. The result was the adoption of an old habit of their newly founded continent, chewing tobacco. The use of chewing tobacco was popular among American frontiersmen, mainly because of its convenience (Christen et al. 1982:826). Chewing tobacco enabled individuals to enjoy a hands-free use of tobacco, which would be helpful when farming, horseback riding, or other activities that required the use of both hands. Additionally, the way plug tobacco was prepared may have been part of the allure.

> After curing, tobacco leaves were laid out in tubs and soaked in various additives to increase the flavour of the soup of saliva and weed that developed in the chewer's mouth. In the days before sugar free sweeteners, the principle additive was molasses and the usual flavouring liquorice (Gately 2001:175).

The sweet properties of the chewing tobacco surely appealed to the men but would also have been favored by both women and children. Additionally, chewing tobacco was compact, required no accoutrements, and was as easy to use as biting off a piece of bread from a loaf.

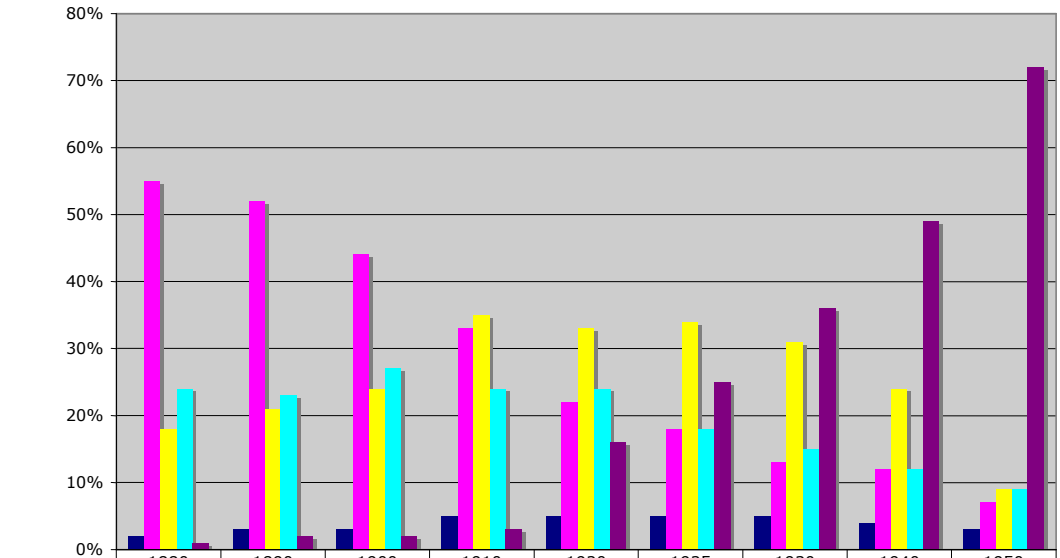
Another statistic pointing toward the public favor of plug is the number of tobacco producing factories. The U.S. Censuses for Virginia and North Carolina of 1860 list 348 tobacco factories, most of which produced chewing tobacco. Only seven list smoking tobacco as a side-product, which was manufactured from scraps left over from plug production (Burns 2007:115). The inflated number of plug factories is likely tied to the economic concept of supply and demand.

The use of chewing tobacco was particularly costly and frequently mentioned as a deterrent, as described in *The Manufacturer and Builder* periodical from 1872: "The man who spends fifty cents per week for chewing-tobacco, will spend, in forty years, at that rate, $1040." Despite this attempt at deterrence, "the practice (of smoking) is carried to excess, whilst the practice of chewing is indulged in to a still greater extent" (Forshaw

1887:9). Charles Dickens criticized the American "swollen" cheek and careless spitting, and was baffled by the excellent reputation of American marksmen and their contradictory lack of spitting aim (Campbell 1964:96).

Similar to other tobacco trends through the centuries, chewing tobacco's popularity was over shortly after it began (relative to its lifespan). The outbreak of tuberculosis in major cities in America led to the abandonment of chewing tobacco due to its health hazard associated with spitting. By the end of the nineteenth century Americans gave up their love for chewing tobacco and reverted to smoking tobacco in the newly perfected form of cigarettes.

The nineteenth century offers a unique perspective of tobacco use as the statistics associated with tobacco sales and consumption began to be recorded. Beginning in 1880, the Department of Agriculture recorded the tobacco production intended for sale in the United States. By sampling this data every ten years, trends throughout time can be visualized in terms of magnitude of favoritism (Figure 8). Plug tobacco was very popular during the 1880s with more than half of all sales (55%), followed by cigars (24%) and cut pipe tobacco (18%). Like a pendulum, the use of plug tobacco decreases as the preference for cigarettes increases. This connection has continued through the twenty-first century, although it is now in the beginning phase of reversal. With all that has been published on the health risks associated with smoking cigarettes, many tobacco patrons have turned to alternative forms of tobacco consumption. The use of moist snuff tobacco, now commonly known as "chew" has gradually increased in recent years due to publications encouraging cigarette smokers to switch from the harmful act of smoking to the "non-harmful" consumption of American moist snuff (Rodu 1995). The number of adult smokeless (moist snuff) tobacco users increased from about 4.7 million in 2001 to about 6 million in 2005. Within those 6 million smokeless tobacco users, 62 percent of them switched from cigarettes to moist snuff (Blackwell 2007:F16).



	1880	1890	1900	1910	1920	1925	1930	1940	1950
Snuff	2%	3%	3%	5%	5%	5%	5%	4%	3%
Plug	55%	52%	44%	33%	22%	18%	13%	12%	7%
Cut	18%	21%	24%	35%	33%	34%	31%	24%	9%
Cigars	24%	23%	27%	24%	24%	18%	15%	12%	9%
Cigarettes	1%	2%	2%	3%	16%	25%	36%	49%	72%

Figure 8. Tobacco Production Percentages for 1880-1950 (Source: Rogozinski 1990).

The transition of tobacco consumption today rarely correlates to the price of tobacco products. Rather it changes based on the social disapproval of things like second hand smoke and the acknowledgement of the harmful health aspects associated with tobacco use. Conversely, the transition of tobacco use during the nineteenth century was brought about by the availability of new forms or at least new affordable modes of consumption. While the downfall of chewing tobacco may have been the connection of tuberculosis to bodily fluids (spit), the invention of the cigarette-rolling machine certainly aided the transition. The American population embraced the cigarette; it was compact, ready to smoke, and only required to be light once as opposed to a pipe. The cigarette also delivered more nicotine to the system, which resulted in an increased neurological sensation of relaxation, a numb feeling valued by many, none more than the members of the military.

History of Tobacco Use in the Military

While tobacco became prevalent among civilians in the United States during the nineteenth century, it also was used by the United States military. Tobacco use by the military has extensive history; in fact, great military leaders have been avid tobacco users through the centuries. Napoleon Bonaparte, Emperor of the French, had a kilo per week snuff habit that equaled about a hundred-a-day cigarette habit of today (Gately 2001:144). The American Civil War also had a famous smoker: Ulysses S. Grant "seldom mounted a horse, addressed his men, or even stepped out of his tent for some fresh air without a cigar tucked between his lips" (Burns 2007:125). During World War II the military leaders were characterized by their tobacco consumption, including Winston Churchill's cigar, Franklin D. Roosevelt's cigarette, and Joseph Stalin's pipe (Robert 1967:271).

The diffusion of tobacco practices throughout the world was partly a result of military operations on foreign land. At the close of the Thirty Years War in 1648, pipe smoking became a general practice in all areas the armies had been, with the Dutch and Germans boasting of their insatiable appetite for tobacco following the war (Brooks 1952:75). Colonel Israel Putnam introduced the cigar to colonial America upon his return from the British campaign in Cuba in 1762 (Brooks 1952:200). By 1765 cigars, at least an imitated version of the Havana cigar, were available in New York (Brooks 1952:201). The Peninsular War, during the first decade of the nineteenth century, introduced the cigar as well as the cigarette to British and French forces fighting on Spanish soil (Brooks 1952:201).

Tobacco modes of consumption may have been transmitted during times of war, but tobacco itself became an integral part of military life. During the American Revolution civilians asked George Washington what they could do to help the war, and he proclaimed, "If you can't send money, send tobacco." Burns (2007) refers to the hardships of the American Revolution and how tobacco would sooth the mind; "There

are accounts from the time of soldiers smoking whenever a spare moment arose, enjoying the occasion not just for its sake but for the memories it evoked of all the pipes and cigars they had savored in better days" (Burns 2007:94). Commanding officers much preferred the use of tobacco by their men over the consumption of alcohol, which was also favored as a novel form of distraction from the horrors of war. Burns (2007) adds, "A man who smoked too much could still aim his gun and hit the enemy; one who drank to excess might pull the trigger and amputate his toe" (Burns 2007:125).

During the Civil War the Confederate government began issuing tobacco rations to soldiers. The act by the Confederate congress read:

> CHAP. LXXI. – *An Act to provide tobacco for the army.*
>
> *The Congress of the Confederate States of America do enact,* That there shall be furnished to every enlisted man in the service of the Confederate States one ration of tobacco, under such regulations as the Secretary of War may establish.
>
> APPROVED February 17, 1864.

The Yankee soldiers were not privy to this additional ration and therefore had to find other means of acquiring tobacco. The Northern soldiers found ways of obtaining their tobacco, the "standard swap through the picket lines was Southern tobacco for Northern coffee" (Robert 1967:120). The use of tobacco had become widespread among the Northern and Southern men. "Soldiers had found the quid a solace in the field and continued to revolve it in their mouths upon returning to their homes" (Oberholtzer 1917:93).

After the Civil War the American government adopted this idea as well, although it was not provided free. The act was explained in the Army Regulations:

> Chewing-tobacco of a quality equal to that known as "navy plug," and smoking-tobacco of a standard grade to be determined by the Commissary-General of Subsistence, will be furnished by the Subsistence Department and sold to the enlisted men of the Army at cost prices, exclusive of the cost of transportation, in such quantities of either kind as they may individually desire, not exceeding a total amount of sixteen ounces per man per month. These sales will be made, once in each

> calendar month, on tobacco returns made in duplicate, duly signed, approved, and presented to the commissary by the company commander, who will receive and receipt for the total quantity of tobacco called for by them, and will deliver to the men the kind and quantity set opposite their respective names, charging them on the next muster and pay-rolls with the cost thereof. Commissaries making these sales will, after filling up the column of "cost," complete and sign the required endorsement on the tobacco returns and deliver one copy to the company commander for file with the company records, the other copy to be forwarded to the Commissary-General of Subsistence with the commissary's abstract of issues of tobacco. Officers in command of companies at the time of muster, and who sign the muster-rolls, will be charged by the Paymaster-General with the cost of all tobacco furnished for issue to their companies during the period covered by such rolls, and not charged thereon to the enlisted men who received it (Coburn 1873:171).

The soldiers were able to purchase either a pound of chewing tobacco or smoking tobacco from the Commissary; there is no mention of the availability of dry snuff or cigars. Snuff was generally associated with high society due to its cost and would not have been a frequent mode of consumption for military personnel, especially since it was not provided to soldiers by the government.

The soldiers became reliant on the government rations of tobacco. While on campaign there was little opportunity to re-supply, the soldiers would instead wait patiently for the shipment. The day ration shipments came was highly anticipated. Pvt. Thomas Coleman with the Seventh Cavalry pronounced:

> Today the long expected steamboat Far West come to the landing and some of the boys got gloriously drunk we drawed 15 days rations and alsoe Tobacco the weed that a soldier likes eaven better than he does Whiskey (Liddic 1979:13).

Since there were such long periods between the ration deliveries, soldiers had to find creative ways to make their supply last longer. There were times of desperation for tobacco by the servicemen. One Cavalryman claimed:

> I have known some of the men in the service to take some of their tobacco, and after the cooks threw away the coffee grounds from the camp kettles after a meal, take some of the coffee grounds and dry them, and mix them with the tobacco. While of course that kind of tobacco was not as good as

> the genuine, it was used to a great extent on a campaign (Barnard 2001:313).

While using food scraps to extend the life of tobacco supplies may have been practiced by a number of soldiers, the tobacco ration also served as a supplement for food. The food provided to the soldiers was not of the highest quality. The men would have wanted something else to satisfy their hunger. Tobacco contains properties that suppress the appetite, which can be very valuable during long periods between rations.

> The recent wars (1887) in different parts of the world show no decrease in man's powers of bodily endurance, as may be instanced in the Crimea, the Egyptian and the Indian Wars, when hunger and fatigue were borne by masses of men almost unequalled, where often the only full supply of wants was in Tobacco, which proved sufficient support until more material nourishment was found (Forshaw 1887:19).

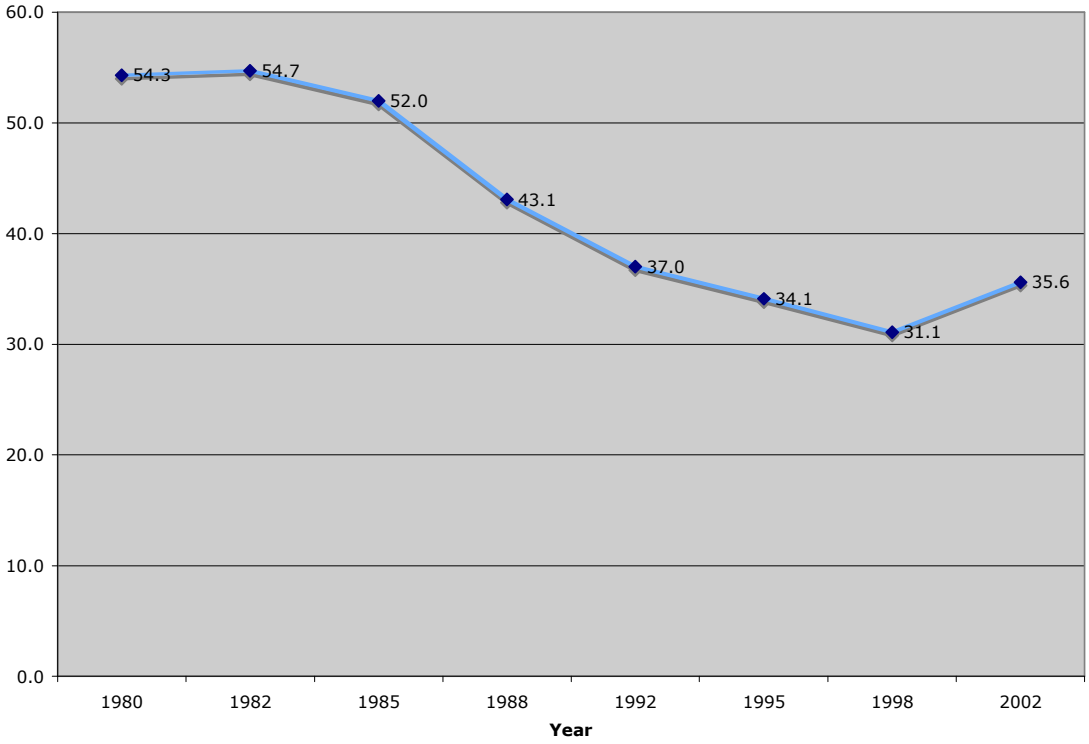
Along with the appetite suppression qualities of tobacco, the relaxing qualities of tobacco were also considered valuable during times of war. During World War I the tobacco industry supported the war efforts by sending cigarettes overseas for the men in the military. Following World War I, the increase of smoking in the military was astounding. As Count Corti states:

> If there were any among all those millions of soldiers who were non-smokers when the War began there were none by the time it was over. The officers in command fully recognized the value of smoking as a means of deadening the men's susceptibilities to the fearful strain to which they were constantly exposed, as well as of mitigating the danger of periods of enforced idleness, and they used every possible effort to ensure a constant supply of the requisite materials (Corti 1931:264).

General Pershing, the commander of American troops in France, went as far to say: "Tobacco is as indispensable as the daily ration; we must have thousands of tons of it without delay" (Corti 1931:264).

The use of tobacco in today's military is relatively high, but has shown a decline since 1980 (Figure 9). The military began surveys of service members' health related behaviors in 1980. There is some question of the validity of these surveys as with any survey. Despite the anonymity of self-administered questionnaires, the truth may not be

reported. "People may lie, or they may, for a number of reasons, unintentionally represent their true feeling or behavior" (Curran 2001:240).



Source: Bray et al. 2003

Figure 9. Trends in Cigarette Use by the U.S. Army 1980-2002 (Bray 2003:6-2).

Tobacco is no longer provided free of charge in time of war as it was during World War II. During the nineteenth century, the military provided opportunity for acquiring tobacco through rations, although this was something the soldiers were required to pay for themselves. Even so, it appears that tobacco use was rather prevalent for soldiers during this earlier period. Given this and insights from other historical research, It is likely that tobacco use was highly prevalent [more so than today] among the military and the general public during the nineteenth century.

With all that has been written about the history of tobacco, the history of tobacco within the military has only been mentioned in-passing. The topic of military tobacco use became a topic of heated discussion by the 1980s due to the realization of the high

frequency of use, although the historical ties were disregarded. An analysis of the historical use of tobacco among the military could produce additional solutions to the modern day epidemic. The nineteenth century brought the invention of the cigarette machine which made tobacco even more accessible to military members; therefore, the nineteenth century serves as a natural point in time to begin a historical analysis of tobacco use among the military. There is a significant amount of historical documentation of the Little Bighorn battle including the osteological analyses of a number of the soldiers who died in the battle, which provides a possible representative sample of soldiers during the nineteenth century.

Chapter 3

But nothing could induce me to use tobacco, either in smoking or chewing. I consider it a filthy, if not an unhealthy practice. I can say what few of my age can – I never chewed tobacco in my life

George A. Custer in *The Custer Story*

THE BATTLE OF THE LITTLE BIGHORN HISTORY AND TAPHONOMY OF HUMAN REMAINS ON THE BATTLEFIELD

The Battle of the Little Bighorn has been the center of much controversy and has intrigued historians, buffs and the American public since the days following the battle. The fascination with this event stems from the enigmatic Lt. Col. George Armstrong Custer and the fate of his Seventh Cavalry. The exact events that took place on June 25, 1876 are largely unknown yet well published (Graham 1953; Hammer 1995; Hatch 2001). Speculations and theories are plentiful; one could have an entire library dedicated to the bibliographic information about this battle.

By 1876 relations between the U.S. Government and the Sioux and Northern Cheyenne hit a boiling point. A major military campaign was launched to order all Indians to return to their designated reservations or face military action. Assisting in the campaign, Lt. Col. George A. Custer, Gen. George Crook, Gen. Alfred H. Terry, Col. John Gibbon and their men marched toward the Yellowstone River in Montana (Figure 10). Crook and his men were forced to turn back, but Custer, Terry and Gibbon united and made plans to attack the Indians in the Little Bighorn Valley. Terry and Gibbon's regiments were to position themselves to head off any retreating Indians. Custer's regiment continued into the Little Bighorn Valley with 600 men divided into three

battalions assigned to Maj. Marcus Reno, Capt. Fredrick Benteen and Custer. The Indian village containing 7,000 people, including 2,000 fighting men, overwhelmed Custer's five companies. Within an hour all 210 men in Custer's battalion were killed (Utley 1999:397).

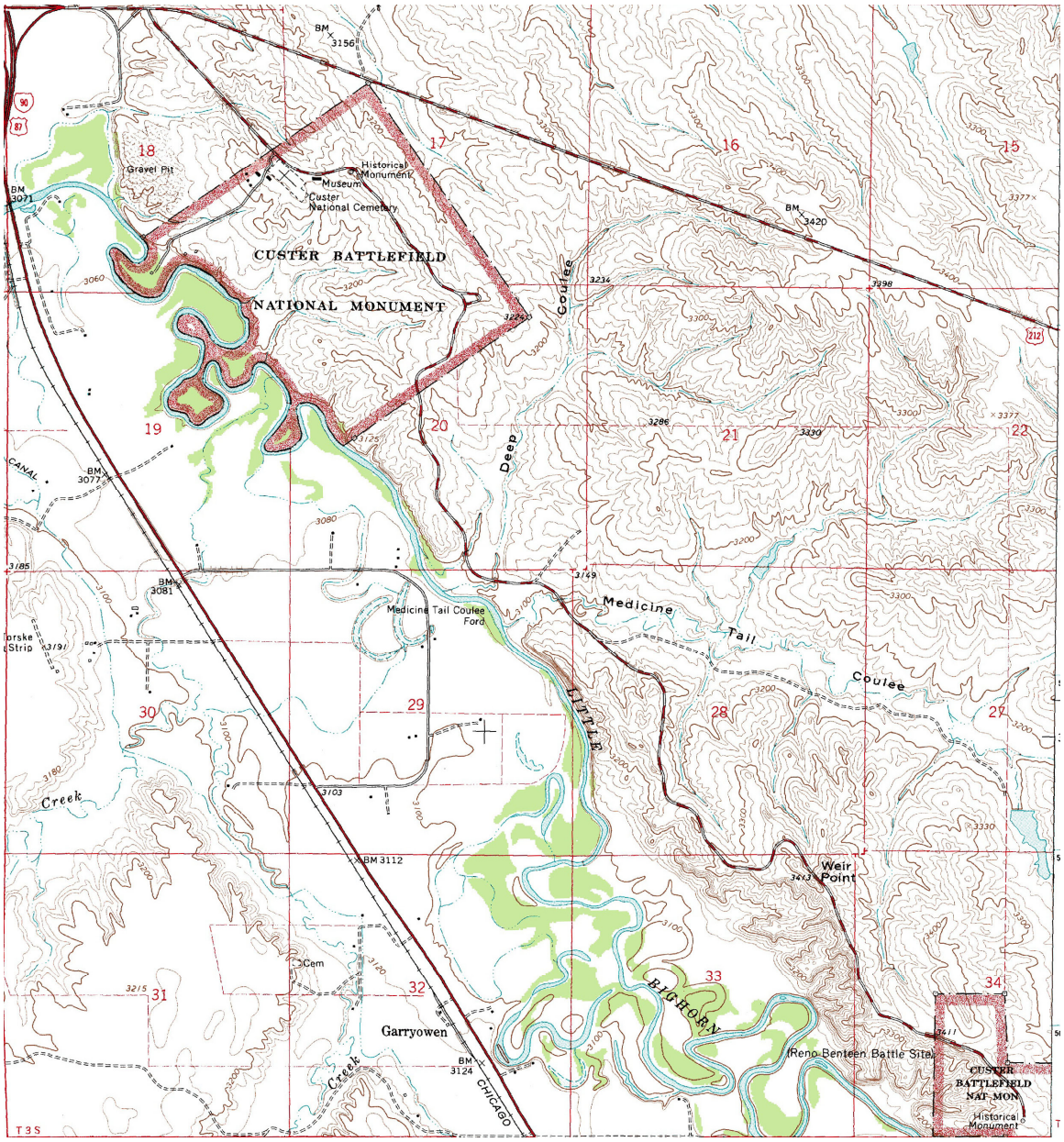


Figure 10. USGS 7.5 minute map of the Little Bighorn Battlefield.

The battle was a devastating loss to the regiment and the U.S. Army. The U.S. Army consisted of 26,312 enlisted men in 1876 broken down into twenty-five infantry regiments, ten cavalry regiments, and five artillery regiments (Coffman 1986). During the Battle of the Little Bighorn, 268 of Custer's regiment were killed, which was just over one percent of the entire enlisted army and almost one quarter of the casualties of the U.S. Army during the Indian Wars (1865-1898).

The days following the battle were tense for the remaining soldiers with Reno and Benteen. Positioned four miles to the south, the Reno-Benteen battalions had no idea of the fate of Custer and his men. Finally, on June 28 the Reno command visited the battlefield. They were charged to bury the dead, although other units assisted. Officers speculated as to the course of events and attempted to explain how and why this had happened. The dead were counted and 210 men had fallen in battle. There was no sign of any survivors from the Custer battalion. Before the burials there were attempts to identify soldiers and to give respectable burials to the officers and more importantly, to General Custer. Identification was complicated by the fact that all clothing had been stripped from the soldiers and taken away by the Indians (Marquis 1953:7).

The Reno command expended little effort to bury the bodies. Most of the bodies merely had mounds of dirt thrown over them. The burials were rushed mostly from fear of the Indians returning to the site. The men were buried where they fell, with the exception of some who were buried in nearby rifle pits (Scott et al. 1998:97). William H. White, a soldier with the burial party of 1876, wrote:

> …the so-called "burials" were simply a respectable gesture. There were in neither our outfit nor the Seventh Cavalry any digging tools other than knives, tin cups and spoons (Marquis 1953:7).

During the late 1860s and 1870s there was a peak in what is called the beautification of death. This phenomenon resulted in highly elaborate funerary display. The dead were to be treated with respect (Little et al. 1992:415). This fashion influenced the treatment of the soldiers of the Little Bighorn. The human bone and artifacts buried

on the battlefield have been surfacing since the day they were first interred in June 1876. The erosion of the dead on the battlefield caused outrage by the public and in turn influenced the military to send out reburial parties in 1877 and 1879 (Willey 1997:1).

A reburial party was sent to the battlefield on July 3, 1877, headed by Colonel Sheridan. This burial party exhumed the remains of the identified officers and returned them for proper interment. Colonel Sheridan commented on the state of the soldiers in a *Chicago Times* article on July 15, 1877. He stated that his men found only bones and all traces of flesh had disappeared (Scott et al. 1998:99).

In 1879, another detail went to the Little Bighorn. This detail was instructed to once again inspect graves for exposed bone, but also to erect a memorial monument. Captain Sanderson was in charge of the 1879 detail. He claimed that parts of four or five bodies were recovered from the field, along with a number of horse bones. The bones of the soldiers were placed in a common grave near the memorial, while the horse bones were placed inside a cord wood memorial (Scott and Fox 1987:16). There is doubt as to the accuracy of bone identification on the part of Sanderson and his men. Sanderson considered the field clear of bones and thought that visitors had mistaken the horse bones as human bones. Mistaking animal bones for human is very common and the identification can sometimes be very challenging. It is highly unlikely that Sanderson had proper osteological training.

Finally, in 1881 the decision was made to exhume all identifiable graves and rebury them properly. A company of soldiers was sent to the battlefield to open the graves and remove the bones as well as collect surface scatter. The remains recovered from the 1881 survey were placed in a mass grave on the top of Last Stand Hill. A large marble monument was placed on top of the mass grave.

Unfortunately, human remains continue to surface. Most of these specimens are small fragments that were overlooked by the exhumation team of 1881 (Scott et al. 1989:254). It would make sense that small fragments of bone were left behind. The

workers were neither trained in osteological identification, nor was it likely to have been stressed as important. The larger bones such as crania, long bones, and pelvis were the most likely to be recovered and reburied.

In 1983 a wildfire swept across the battlefield, once again exposing human skeletal remains. The fire of 1983 resulted in an archaeological excavation that spanned two field seasons in 1984 and 1985. The goal of these excavations was to identify the locations of any human remains, gain more information on the flow of combat based on artifact recovery, and to "determine correlation between present marker sites and actual historic burial locations" (Barnard 1998:16)

The researchers used metal detectors to map patterns of artifacts in order to reveal site formation processes. During the metal detection, human remains were recovered in association with metal artifacts. The marble markers that were placed on the field to identify fallen soldiers were examined, although there were more markers than soldiers. The markers were examined to see if they were actually associated with remains. Visual inspections, in addition to excavation around markers, produced small bones from hands and feet as well as vertebrae and some portions of arms and legs. These are the types of remains that would be expected to be left behind in a grave that has been disinterred (Scott and Fox 1987:100).

Dr. Clyde Snow, a consultant to the Oklahoma Medical Examiner's Office, analyzed the bone recovered from these excavations. Dr. Snow noted that the surface finds were very deteriorated due to the exposure on the ground surface; such remains were limited in the information they could provide. The remains excavated near the markers proved to be more useful for analysis.

Many of the bones recovered surrounding the markers exhibited signs of trauma. Hatchet marks and arrow abrasions were identified as well as skull crushing. The location of the bones relative to each other helped to distinguish if dismemberment might have been present, although the cut marks gave direct evidence of this. Scavengers could

have been the culprits for the movement of some of the bones. This is one example of the value of taphonomic assessment.

In 1989 Douglas Scott headed another excavation at the Custer National Cemetery. He was able to study the remains of soldiers who had been reburied in the National Cemetery in 1903, 1928, and some time prior to 1940 (Scott and Willey 1997:155). This study stands out from the others because they were able to study nearly complete skeletons rather than fragments and small insignificant bones. Scott and Willey's findings include six individuals with gunshot wounds (three in the skull), numerous cut marks near joints (which infer dismemberment), and cuts on the skulls (scalping attempts). These burials are useful in helping to determine the survivorship of bones after reinterment, since the remnant bones in each burial can give some insight into which bones were collected and deposited in the mass grave.

Taphonomy

Taphonomy is the study of postmortem chances in the preservation, observation or recovery of dead organisms, as well as the reconstruction of their biology, ecology, and circumstances of death (Haglund and Sorg 1997:13). Bones can give a unique point of view of a person in life and in death. Their age, sex, ancestry, as well as diseases and injuries can be determined by the examination of bones. Bones can also tell us where they have been, if they were buried, scavenged by carnivores, collected and gnawed on by rodents, if they were properly curated or dumped without care. The most accurate bones for determining age, sex, and ancestry are the cranium, long bones and pelvis. These are the same bones that were most likely identified by the burial party of 1881 and interred in the mass grave on Last Stand Hill. An excavation of the mass grave could provide a great amount of information about the soldiers and tell more of the journey the bones encountered after deposition.

Ascertaining the taphonomic processes is a valuable form of analysis. Determining which alterations were caused by natural events versus human events can help with the reconstruction of the human behavior that resulted in a death. The physical evidence is essential for a recreation of events, something that historians have been attempting to do for over 100 years. To rely on eyewitness accounts alone is unreliable. The bones do not lie.

Taphonomic changes have greatly affected the site of the Battle of the Little Bighorn in Montana. Understanding and recognizing these taphonomic processes can reveal aspects of history that could prove important for both analyses and interpretation. Paleontologists first used the term taphonomy to describe the processes of fossilization. The term taphonomy means "law of the grave" (from the Greek root, taphos = the grave). Forensic taphonomy in its most basic form asks the question "What are these bones doing here?" A more detailed definition states that:

> Forensic taphonomy refers to the use of taphonomic models, approaches, and analyses in forensic contexts to estimate the time since death, reconstruct the circumstances before and after deposition, and discriminate the products of human behavior from those created by earth's biological, physical, chemical and geological subsystems (Haglund and Sorg 1997a:3).

Taphonomic Theory

Taphonomic theory outlines five different assemblage phases (Klein and Cruz-Uribe 1984:3):

1. The *life assemblage* (the community of live animals in their "natural" proportions);
2. The *death assemblage* (the remains are available for collection by people, carnivores, or any other agent of bone modification);
3. The *depositional assemblage* (the carcasses or proportions of carcasses that come to rest at a site);
4. The *fossil assemblage* (the animal parts that survive in a site until excavation or collection); and

5. The *sampled assemblage* (that part of the fossil assemblage that is excavated or collected).

This theory reviews the transitions that human remains endure beginning with interment in one or more locations through the modifications they undergo during these transitions. Not all bones have an equal chance of survival based on the depositional stages they endure. The recovered bones can therefore represent a skewed sample of the initial deposition (Haglund and Sorg 1997b:17). In order to derive any useful information, taphonomic pathways must be identified. Taphonomic pathways determine which bones survive to the stage of collection. These taphonomic pathways act to destroy, import, or export bones to and from a locale. These pathways can include carnivore activity as well as water transportation, but remains can undergo a series of multiple pathways simultaneously. An example would be a bone that has been dragged away by a carnivore and then deposited into a stream where it is transported downstream (Haglund and Sorg 1997b:17).

Being able to trace the avenue of transportation of bones can be helpful in relating those separated bones with others from the same individual. The greater the number of available bones for an individual, the greater the chance of identification. Determining the origin of scattered bones can help establish either a dump zone or the scene of death. With the scene of death established, evidence can be collected to assist with the reconstruction of the death and possibly evidence that can lead to identification such as personal items.

Taphonomic Factors of the Little Bighorn Battlefield

Many written accounts described the ghastly sight two days after the battle on the battlefield. Most accounts make reference to the decomposition of the bodies and the difficulty in identification. William H. White, a soldier with Col. Gibbon, wrote that:

> …the soldier bodies were bloody, dirty, and were swollen and discolored from the exposure to the hot sunshine, with millions of flies macerating the features into further decay (Marquis 1935:7).

Decomposition rates are well documented in the forensic field. The decomposition that was evident during the reburial party of day two is consistent with these recorded rates. This decomposition phase begins with the discoloration of the body by 24 hours and after 36 hours the body begins bloating (Scott et al. 1998:117). This rate of decomposition coincides with the research done by Terneny (1997) on mature pigs in Missoula, Montana. Terneny found that on the second day of full exposure, fly activity was especially apparent and the skin color of the carcass began to change to a deep purple as well as the first signs of bloating in the abdomen. This disturbing sight, in addition to limited digging tools, could account for the rushed burials by the Reno Command on June 27, 1876.

First Sergeant John Ryan of the Reno command was one of the soldiers ordered to bury the men. He writes:

> The burial did not amount to much, as we only had a few tools. We simply dug up a little dirt aside of the bodies and threw it over them. In a great many instances their arms and legs protruded out…. Some of the troops burying those men had no shovels. They had a few axes and chopped down some wild sage brush and put it over the bodies (Barnard 2001:303, 305).

The protrusion of the arms and legs from these initial burials was essentially an invitation for carnivores to scavenge, which is included in the second phase of taphonomic assemblages, the death assemblage. According to Haglund (1997), the first stage of canid-assisted scavenging is the destruction of the ventral thorax followed by disembowelment and removal of one or both upper extremities including scapulae and clavicles. This stage is usually observable during the postmortem time interval of 22 days to two and a half months. Stage two during the postmortem interval of two to four and a half months involves the removal of lower extremities by scavengers. After the extremities have been removed, they are usually transported as a unit to a distance away

from the remains (Haglund 1997:375). This transportation of body parts occurred around the battlefield site and made the sightings of human remains more frequent to visitors. The minimal effort given to the burying of the soldiers on the battlefield led to weathering and scavenging of exposed remains. Major George Forsyth wrote about the state of the site on July 21, 1877 following the burial team:

> We found that, as a general rule, the graves were in as good a condition as, under the circumstances and considering the extreme lightness of the soil and the entire absence from it of clay, gravel, or stones, could have been expected… The soldiers' graves were generally grouped together in four distinct places, and with two exceptions where wolves had dug for prey, were well covered. On the side of a ravine where a number of bodies had been buried, we found several skeletons that had been exposed by rains washing the side of the ravine…Upon the west side of the river, we also discovered parts of several skeletons disinterred by wolves. I do not think that there will ever be a time in the spring, or after spring rains, that portions of skeletons will not be exposed, if the remains are left there, for the soil is so light, bakes so hard and disintegrates to such an extent in summer, that washouts from four to ten feet in depth among the bullocks are not at all unusual (Graham 1953:371).

Major Forsyth makes reference to two different natural taphonomic factors that disturbed the burial since 1876. The first of these is the wolf scavenging activity. The scavenging of carnivores can be devastating to the preservation of bone thwart the possibility of recovery:

> Scavenging results in disarticulation, which in turn produces easily transportable units of single bones or bone groups which can be removed from a site by animals, or geological vectors such as water; influences the pattern of bone dispersion; and exposes bones to damage such as weathering (Haglund et al. 1989:587).

The second factor that Major Forsyth refers to is the weathering process. The soil on the battlefield is fine and lacks high clay content. This fine soil can be transported easily by wind and water, which results in the exposure of the human remains:

> Once exposed to the surface, the skeletal elements begin to weather; in other words, they are affected by the combination of sunlight, temperature

> differentials and moisture. Exposure to the sun and heat from the sunlight will dry the bone and bleach it (Haglund and Sorg 2002:141).

The exposure of the bone to the elements can also cause fractures that will absorb moisture, which will cause the bone to swell or expand as the temperature lowers. This results in accelerated decomposition (Haglund and Sorg 2002: 141). Others also recognized the consequence of the light soil. Major General Scott recalls his observations during Sheridan's 1877 reburial team:

> I went out with a detachment to bury all the others I could find. There was no time to dig deep graves, and I was told to cover the bones made up into little piles where they were lying. This I did, but the soil was like sugar and I have no doubt the first rain liquefied it and exposed the bones later. We had neither the force nor the time to rebury the whole command in deep graves, as we were obliged to join the main command (Scott 1928:48).

Colonel Sheridan identifies cultural taphonomic factors as well. Sheridan refers to this cultural intrusion of "human coyotes" which in present day we would call "pot hunters" or "curio hunters":

> … I am half inclined to think, strange as it may appear, that nearly all the desecration of graves at the Custer battlefield has been done by curiosity hunters in the shape of human coyotes. I have myself known of one or two cases where bones were exhibited as relics from the Custer Battlefield (Graham 1953:370).

The collection of historic artifacts is not something that was isolated to that time alone. In fact, one of the early superintendents at the battlefield was known to plant gun casings for the curio hunters who visited the battlefield early in the twentieth century (Hardoff 1985:1). By planting artifacts on the field, the superintendent was able to deter collectors from digging holes in search of artifacts; instead they could just pick them up from the surface. The natural erosion and souvenir collecting which caused the bones to become uncovered again over the next two years, which required yet another reburial team to clean up the site in April of 1879.

A variety of processes have altered the site since the exhumations and reburials of 1881. The natural erosion and animal activity still brings bones to the surface as does human activity including construction and archaeological excavation. For the most part, bones were buried, reburied multiple times and then finally excavated and reinterred in a mass grave. There is potential for some bones to have been moved multiple times during each reburial event. The remaining bones on the field were likely those that were overlooked by one or more of the reburial parties. Haglund (1997) discusses the success of recovery efforts. He states that the recognition of various bones by those untrained in osteology differs. Most people will recognize a human cranium, which increases the likelihood of discovery. Other skeletal material may go unnoticed or overlooked because of the lack of recognition. The recovery teams may have entirely overlooked the scavenged parts after they had become disarticulated. Hands and feet, generally, are often not recovered because of the easy transportation once they have been removed from the body, although hands and feet are more likely to be overlooked during recovery because of their small size.

Prior to 1958, there was little documentation of the bones recovered from the battlefield. Usually the bones that were discovered were reburied without analysis. Doctors or other collectors donated many remains to the old Army Medical Museum. The Army Medical Museum donated their collection to the Smithsonian where there are still contributions from personal collectors.

Each of these above taphonomic factors affecting the battlefield has hindered the amount of remains available for further study. The most telling bones being those of the skull, were likely the first to be identified and therefore the first to be interred. The fate of those bones left on the battlefield was even more dire, with carnivores and water carrying them off, and with sun bleaching and deteriorating the bones; all of those processes have made observations difficult. For a study on tobacco consumption of the soldiers from the Battle of the Little Bighorn, the likely interred remains of the mass

grave would have the most inferential data concerning the frequency of tobacco use, while the bones left out in the elements would have poor preservation resulting in further complications in identifying tobacco related markers.

Chapter 4

If I have seen further it is by standing on the shoulders of giants.

Isaac Newton in *Letter to Robert Hooke*

METHODS

The Battle of the Little Bighorn has been studied since the day after the event. Historical documents have been compiled over the past 100 years, all to gain a better understanding of the life of the soldiers and their last battle. The use of material remains discovered on the battlefield has contributed to this array of knowledge (Scott and Fox 1987; Scott et al. 1989; Fox 1993; Scott et al. 1998).

One of the unrepresented areas of study relating to the Battle of the Little Bighorn is the soldiers' consumption of tobacco. With the identification of only two artifacts relating to tobacco use, tin tobacco tags (Scott and Fox 1987:86), it was necessary to find another type of data to study tobacco consumption among those soldiers. Since human remains represent the other type of evidence available in the archaeological record, they became the primary focus of this thesis. Data from previously excavated human remains from the Little Bighorn Battlefield reveal a high frequency of tobacco use (Table 1).

There were two major excavations that produced osteological tobacco related evidence, including the 1984-1985 excavations and the 1992 excavations. The remains of individuals discovered from these excavations exhibited several indicators of tobacco use, including some which more than one sign of tobacco consumption. In 1983 a fire cleared the battlefield of brush and grass revealing additional human remains of soldiers

from the famous battle. This exposure resulted in a two-season excavation surrounding the

Specimen	Consumer	Manner	Source
Markers 33-34			
Mitch Boyer	Yes	Pipe Smoker	Scott et al. 1988:2
			Snow & Fitzpatrick 1989:257
Reno Crossing	No		Scott & Snow 1991
CNC Burial 1	No?	Snuffer?	Willey et al. 1996
CNC Burial 2	Yes	Chewer	Willey et al. 1996
CNC Burial 3	Yes	Smoker	Willey et al. 1996
CNC Burial 4	No		Willey et al. 1996
CNC Burial 5	Yes	Chewer	Willey et al. 1996
CNC Burial 7	Yes	Pipe Smoker	Willey et al. 1996
CNC Burial 8A	Yes	Smoker	Willey et al. 1996
CNC Burial 8B	Yes	Pipe Smoker	Willey et al. 1996

Table 1. Smokers and Nonsmokers among the Little Bighorn Skeletons (Source: Scott et al. 1998).

skeletal remains. The 1984-1985 excavations of the battlefield produced one individual with teeth "worn in such a manner as to suggest that the individual was a pipe smoker" (Scott et al. 1998). A smooth elliptical wear pattern can be the result of the consistent placement of a pipe mouthpiece made of abrasive clay (Morris 1988:361).

A more significant number of individuals exhibiting tobacco consumption evidence were produced from the 1992 excavations of the Custer National Cemetery. This excavation allowed researchers to excavate seven separate graves containing an unknown number of soldiers from the Little Bighorn battle for the purpose of osteological examinations that could identify the remains (Scott and Willey 1997:158). Of these seven graves and eight identified individuals excavated, seven soldiers displayed varying types of evidence of tobacco consumption. The Custer National Cemetery (CNC) Burial 1, had a "possible nasal passage lesion, perhaps resulting from snuff use" (Scott et al. 1998:181). There is very little published on the effects of snuff on the nose due to the limited number of current habitual users of this form of tobacco use (Sapundzhiev 2003:688), rendering skeletal interpretations of snuff use an area of study

with little data. It is possible that with prolonged habitual use, the nasal passage could produce irregularities indicating snuff irritation. It is unlikely that soldiers of the nineteenth century would have partaken in a habit, which required a great number of accoutrements and was scarcely available. CNC Burial 2 had stains present suggesting tobacco use in the form of either chewing or smoking. P. Willey describes the stains: "supporting the possibility of tobacco chewing are stains on the anterior mandibular teeth, where 'chew' is often placed, and the occlusal attrition on the right side" (Willey 1997:29). Most smokeless tobacco users place the tobacco between the gums and cheek or in the cheek and then suck on the tobacco and spit the tobacco juices. The tobacco wad would then be chewed to release more juices which in turn would cause the wearing down of the teeth on the opposite side of the ball of tobacco. CNC Burial 3 has two indicators of tobacco use: tooth staining and exostoses (bone growths) along the temporal line. Willey claims that these exostoses could be evidence of pipe clenching or tobacco chewing (Willey 1997:43). An exostosis is "a bony growth from a bone surface, often involving ossification of muscular or ligamentous attachments" (White 2000:525). The constant contraction of the temporalis muscle, which attaches to the temporal line, could cause an ossification at the point of muscle attachment (Figure 11).

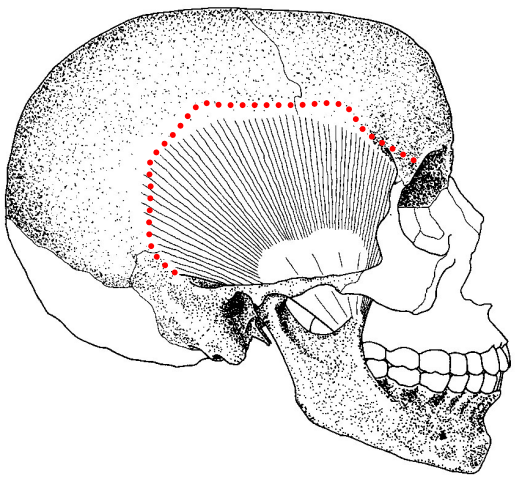


Figure 11. Temporal muscle and point of attachment; the ossification caused by constant contraction of the temporal muscle would be evident along the dotted line (Stone 2003).

CNC Burial 5 was poorly preserved, which made observations difficult, but there were brown stains noted on many of the teeth (Willey 1997:65). CNC Burial 7 also had dark stains on the teeth consistent with pipe smoking (Willey 1997:91). Pipe smokers often have dark brown discoloration on their teeth resulting from the irritation of the heat and tar found in tobacco (Nurvid and Agubg 2000:252; Davies 1963:217). CNC Burial 8A had dark brown staining on the lingual surface of most teeth probably from tobacco use (Willey 1997:107). The lingual surface of a tooth is the surface that touches the cheek. Staining that occurs on this surface could be the result of smoking tobacco or chewing tobacco. The use of cigars and cigarettes would produce dental staining indistinguishable from those produced by plug and pipe use, although during the nineteenth century cigars were quite expensive and likely economically out of reach of soldiers. Finally, CNC Burial 8B displayed strong indications of tobacco use. Pipe smoking was identified by the presence of a pipe-stem groove on the left premolars as well as dark stains on the right mandibular teeth (Willey 1997:108). In sum, tobacco consumption can be observed through by a variety of means, including staining, dental groves, nasal lesions, and temporal exostosis; all of these were applied to the identification of tobacco users in the Custer National Cemetery.

These physical remains represent a select sample of the soldiers who lost their lives in the Battle of the Little Bighorn. In order to see if this information provides a representative sample of tobacco users in the Seventh Cavalry, military historical documents, namely Army Muster Rolls, will be used to compare the frequency of tobacco use to see how this case study contributes to an understanding of nineteenth-century tobacco use among the military.

Army Muster Rolls, or pay rolls, contain information such as the Company roster of soldiers, deserters, new recruits, and deaths. Additional information was recorded on Muster Rolls relating to pay, such as clothing charges and tobacco ration charges. The Rolls include a column titled “Due to U.S., Tobacco Ration.” Tobacco was considered a

"ration," although the soldier was responsible to reimburse the army for any received tobacco ration through pay rolls as required by law. Enlisted soldiers were entitled to one pound of tobacco per month, whereas Officers were not provided tobacco but they could purchase it from the commissary officer. Preliminary analysis of Muster Rolls from May-June 1876 show a rate of 90 percent of the soldiers taking tobacco rations (Table 2).

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	24	24	100.0	0	0
A	59	2	3.5	57	96.5
B	77	9	14.2	68	85.8
C	67	1	1.5	66	98.5
D	66	5	7.5	61	92.5
E	64	3	4.6	61	95.4
F	68	9	13.0	59	87.0
G	52	4	6.0	48	94.0
H	57	0	0	57	100.0
I	68	4	6.1	64	93.9
K	67	1	1.4	66	98.6
L	57	6	10.4	49	89.6
M	64	5	9.3	59	91.7
Total 790	73	9.3		715	90.5

Table 2. Tobacco Ration due the U.S. Government for May-June 1876, for the Seventh Cavalry (Source: Scott 1998).

For this thesis research, Muster Rolls were obtained from the Bighorn Battlefield Archives and were examined for a period of 16 years surrounding the year of the battle (1867-1882). Due to the amount of data in this large stretch of time, a representative sample of one May-June report each year, for each of the 13 companies, facilitated the analysis. A total of 208 Army Muster Rolls were examined and calculated.

The soldiers included in this analysis were enlisted men, which consist of 1st Sergeants, Sergeants, Corporals, Trumpeters, Farriers, Blacksmiths, Saddlers, and Privates. Soldiers who died were included in the analysis, as well as soldiers who had

been discharged. Two categories were excluded from this study: Transfers and Deserters. The muster rolls specified if a soldier had been transferred, deserted, or died, as well as any other information related to a change in a soldier's status.

The Transferred soldiers were often transferred within the Seventh Cavalry, therefore being recorded on a different Company Muster Roll. During this transfer the soldier was able to gain two rations of tobacco, one from each Company. I felt this would cause an artificial inflation in my data so I excluded these individuals.

During the 1870s there was a high number of soldiers who deserted their posts due to the work expectation. Soldiers were ordered to "quarry stone, make adobe, operate sawmills, burn brick and lime, drive wagons, and cut wood," causing great distress among the ranks (Delo 1998:143). The Deserter soldiers were kept out of the analysis mainly on the basis of inconsistent data within the Muster Rolls. Some Companies would have deserters charged for clothing and tobacco rations, while others would not charge for either. Due to the fact that I was unable to determine the policy of charging deserters for their provisions I did not include their data.

Each Company's Muster Rolls were analyzed by recording the total number of soldiers in each company along with the total number of soldiers who took their tobacco ration. All of the Company's totals were added together to give an overall percentage for that particular year. These percentages represented the overall frequency of tobacco rations received by the Seventh Cavalry during the May-June months in this 16-year span. Each year's percentage was calculated and evaluated for trends. The mean and median calculations were applied to each May-June data block.

The Muster Rolls of 1867 were incomplete due to the fact that the military was just beginning to record the statistics of who took tobacco rations and who did not. There were four Companies that had no data available, so those Companies were excluded from the analysis.

Each quarter of each year has a significant variation in the number of soldiers present in the Seventh Cavalry. The lowest population recorded was 594 soldiers mustered in 1867, whereas the highest population was almost double at 1023 soldiers mustered in 1871. To make the statistics from each year comparable, the results are presented as a ratio of total number of soldiers taking their tobacco ration per Company over the total number of soldiers in the Company. All results are outlined and discussed in the next chapter.

Chapter 5

It is now proven, beyond a doubt, that smoking is a leading cause of statistics.

Fletcher Knebel

RESULTS AND DISCUSSION

The primary purpose of this research was to conduct a longitudinal study of the frequency of tobacco consumption among the soldiers of the Seventh Cavalry during the late nineteenth century. First, the results of previous studies of skeletal remains from the Battle of the Little Bighorn were reviewed; second, the Army Muster Rolls associated with the soldiers of the Seventh Cavalry were examined and recorded for the frequency of soldiers taking their tobacco rations; thirdly, historical government documents were reviewed to enable a more reliable generalization of tobacco consumption among the United States Army personnel. For the purposes of this study, the phrase "tobacco use or consumption" refers to the use of smoking tobacco which utilizes a pipe as well as the use of chewing tobacco. Cigarettes were invented during the late nineteenth century but were neither provided for purchase to the military members, nor were they available on the western frontier. Additionally, it should be pointed out that chewing tobacco or plug is not the same as the chewing tobacco we today call "chew." Chew of the brand name Skoll or Copenhagen is actually moist snuff and is not intended to be "chewed" at all.

After an analysis of 208 military Muster Rolls from the Seventh Cavalry during 1867-1882, it appeared that the overall frequency of soldiers taking tobacco rations over the course of 16 years was 86.6 percent. Each of the Seventh Cavalry's Company Muster Rolls was examined for frequency of charged tobacco rations. A total of 13,016 records of individual enlisted men were examined. Results of the frequency analysis of "Tobacco

Rations due the US Government" from the Seventh Cavalry during 1867 through 1882 are presented in the table below (Table 3). The highest frequency of tobacco purchase among the Seventh Cavalry (95%) occurs in 1878, whereas the lowest frequency (80.7%) occurs in 1868. This reveals a steady trend of significant tobacco purchase among the soldiers, with no apparent decline.

Year	Enlisted Men	**Not Due**		**Due**	
	Total	Number	Percentage	Number	Percentage
1867	594	71	12.0%	523	88.0%
1868	907	167	18.4%	732	80.7%
1869	807	143	17.7%	661	81.9%
1870	975	162	16.6%	813	83.4%
1871	1023	173	16.9%	848	82.9%
1872	858	116	13.5%	742	86.5%
1873	817	114	14.0%	703	86.0%
1874	873	89	10.2%	722	82.7%
1875	746	80	10.7%	666	89.3%
1876	796	59	7.4%	737	92.6%
1877	997	104	10.4%	893	89.6%
1878	716	36	5.0%	680	95.0%
1879	766	59	7.7%	705	92.0%
1880	772	80	10.4%	692	89.6%
1881	739	110	14.9%	629	85.1%
1882	630	102	16.2%	528	83.8%
Total	13016	1665	12.8%	11274	86.6%

Table 3. Tobacco Ration due the U.S. Government for May-June 1867-1882, for the Seventh Cavalry.

The average percentage of soldiers taking their tobacco rations for each year, at first glance, appears to be inflated in the percentage of soldiers taking their tobacco rations between 1868 and 1878 (Figure 12). After additional analysis, it becomes evident that there is little variation among the percentages; in fact there is a standard deviation of 4.2. To verify that these percentages accurately represent the data distribution, the use of all statistics from each of the Companies for each year was compiled to create a bell-curve.

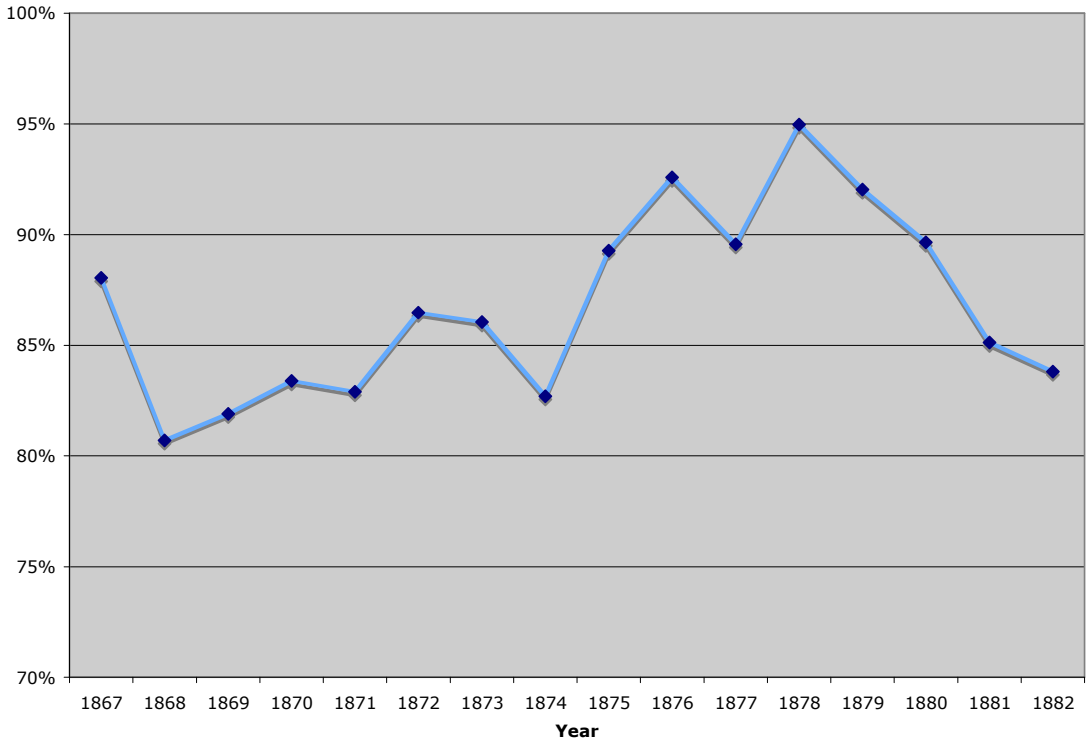


Figure 12. The average yearly percentage of Seventh Cavalry soldiers taking their tobacco ration as recorded in the "Tobacco Ration due the U.S. Government" column on Army Muster Rolls for May-June 1867-1882.

To summarize the data collected, measures of central tendency were used to assist in breaking down the percentages into an easily understood number. Half of the total percentiles (N=202) for all Companies were above and below 88%, making this the median of the data (Figure 13). The median represents the exact center of the score distributions (Healey 2002:69). The mean, or average score of this distribution is 86%, which makes this data distribution only slightly negatively skewed (Healey 2002:75). Overall, when the data is graphed (Figure 13) by frequency of occurrence, a majority of the data is clustered around the mean and median with very little variation. This chart represents a high consistency of soldiers taking their tobacco rations among all Companies and all years included in this study.

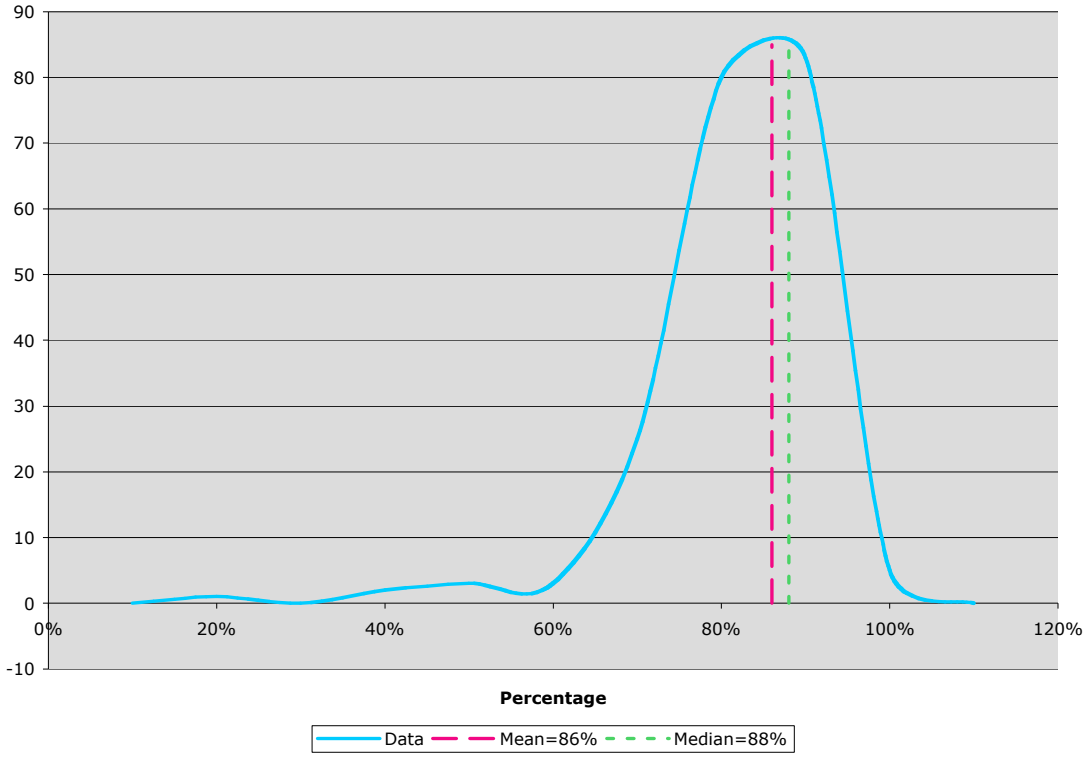


Figure 13. Data distribution of each Seventh Cavalry Companies yearly average of soldiers taking their tobacco rations as recorded in the "Tobacco Ration due the U.S. Government" column on the May-June Army Muster Rolls for 1867-1882.

These high frequencies appear to be common among the Army personnel and not an isolated example. To verify that these high percentages of soldiers were taking their tobacco rations throughout the Army as a whole, an analysis of the total sales of tobacco within the Army was compiled. Beginning in 1867, the Subsistence Department was created to provide articles to officers and enlisted men "at cost prices and if not paid when purchased, to use payroll deductions" (Delo 1998:142). The military personnel of the frontier led a harsh and monotonous existence, void of simple pleasures. The Subsistence Department was designed to provide supplemental necessities to the military personnel that were outside of the range of major arterial roads and towns. Food, clothing and the all important indulgences of whisky and tobacco were all to be provided by the Subsistence Department (Delo 1998:144). The tobacco purchased by both officers

and enlisted men from the Army began being recorded in 1877 in the *Report of the Commissary-General of Subsistence* for the Secretary of War. This information was reported in a variety of ways, including dollar amount collected from soldiers for their tobacco ration (Muster Roll credit), pounds of tobacco sold above and beyond tobacco rations (cash sales at Subsistence Stores), and then the total quantity of tobacco purchased with credit or cash. The most consistent way of reporting the tobacco sales within the Army was the total dollar amount collected from enlisted soldiers for tobacco purchased on credit (Figure 14).

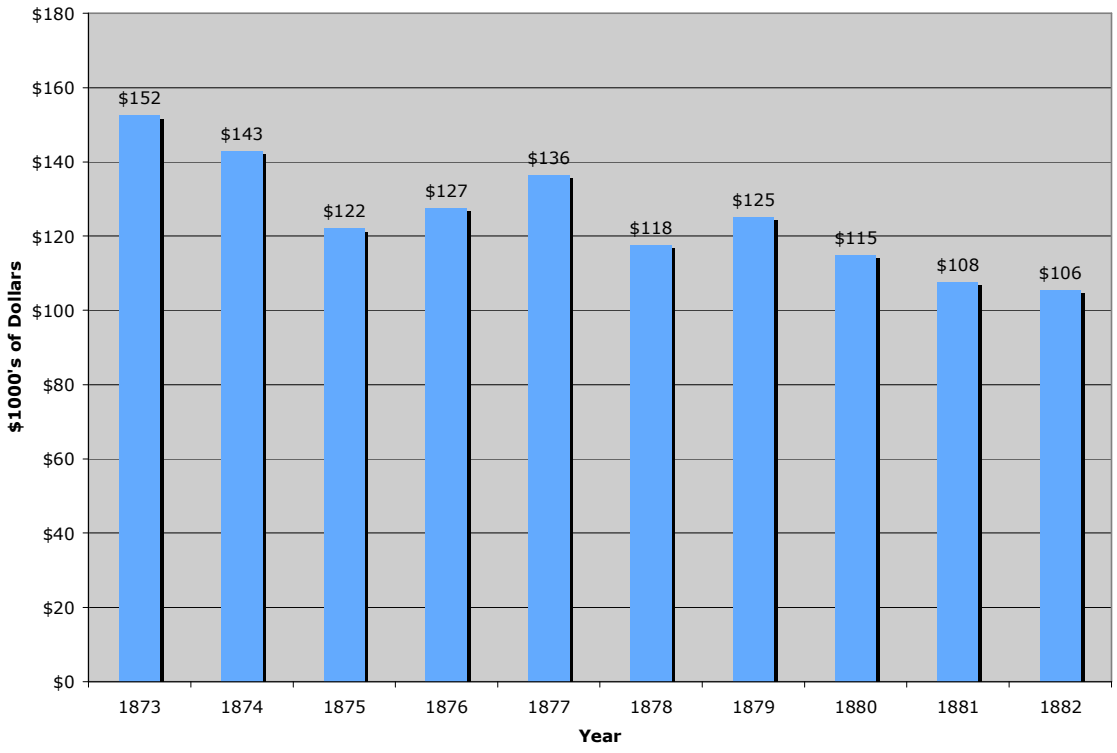


Figure 14. Annual value of tobacco furnished to enlisted men and charged to Muster Rolls, 1873-1882.

Sources: Eaton, 1873, 1874; Shiras 1875, MacFeely 1875,1877, 1878a, 1878b, 1880, 1881, 1882, 1883 (for data refer to Appendix C, Table 2)

Unfortunately, this method of reporting is difficult to compare across multiple years due to the fluctuation in cost of tobacco through the years, and even of the course of a few months. Additionally, these figures include the total sales of both smoking and chewing tobacco, which are differently priced. For example, the cost of one pound of chewing tobacco in 1877 was $0.52, whereas the cost of smoking tobacco was $0.80 per pound (MacFeely 1878a:342). Tobacco, being an agricultural item, had prices that rose and fell depending on the crop yield. There was also a tax imposed on tobacco sales, resulting in variation in price. From 1866 through 1872, the tax on manufactured tobacco was $0.30 per pound, which dropped to $0.22 per pound from 1873-1879 and again dropped to $0.15 per pound from 1880-1883 (Jacobstein 1907:452). Each of these factors made it difficult to compare dollars of sales across time.

One of the goals of this research was to be able to predict the frequency of tobacco use indicators on future skeletal samples, as well as to determine which types of tobacco related indicators would most likely be present based on the different modes of consumption. To achieve this goal, it was necessary to calculate the frequencies between chewing tobacco rations taken versus smoking tobacco rations taken. Unfortunately, the Muster Rolls made it difficult to distinguish between the purchases of chewing tobacco versus smoking tobacco. In the column marked "Due to U.S., Tobacco Ration," there is an apparent difference in price between the two forms of tobacco sold to the enlisted men, but it does not indicate how much each pound of tobacco cost. Additionally, the Muster Rolls are quarterly reports that include more than one month of sales. For example, the 1876 Muster Rolls indicate that individuals were charged $1.14 for their tobacco ration. This amount is actually for two pounds of tobacco, most likely plug tobacco since the price of chewing tobacco in 1877 was $0.52 per pound. Due to the extreme fluctuation in cost of tobacco through the years, this statistic would be very difficult as well as time consuming to calculate. To provide an alternative set of data, the

Report of the Commissary-General of Subsistence for the Secretary of War was again employed.

The reporting of types of tobacco sold by the Subsistence Department began being reported in 1876, the year enlisted men were given an option of buying tobacco with cash instead of having it charged to their muster rolls (section 1144, Revised Statute). Initially, the Subsistence Department only recorded the quantities of smoking vs. chewing tobacco sold for cash and continued reporting credit muster roll sales in dollar amounts. In 1880 the Subsistence Department changed its reporting process once again and began reporting the totals of both chewing and smoking tobacco quantities sold for both the soldiers paying cash and credit. This caused some difficulty in comparing the sales annually. Therefore, in an effort to establish the frequency at which each type of tobacco was sold, a ratio of pounds of each type of tobacco sold was divided by the total quantity of tobacco sold for the year (Figure 15).

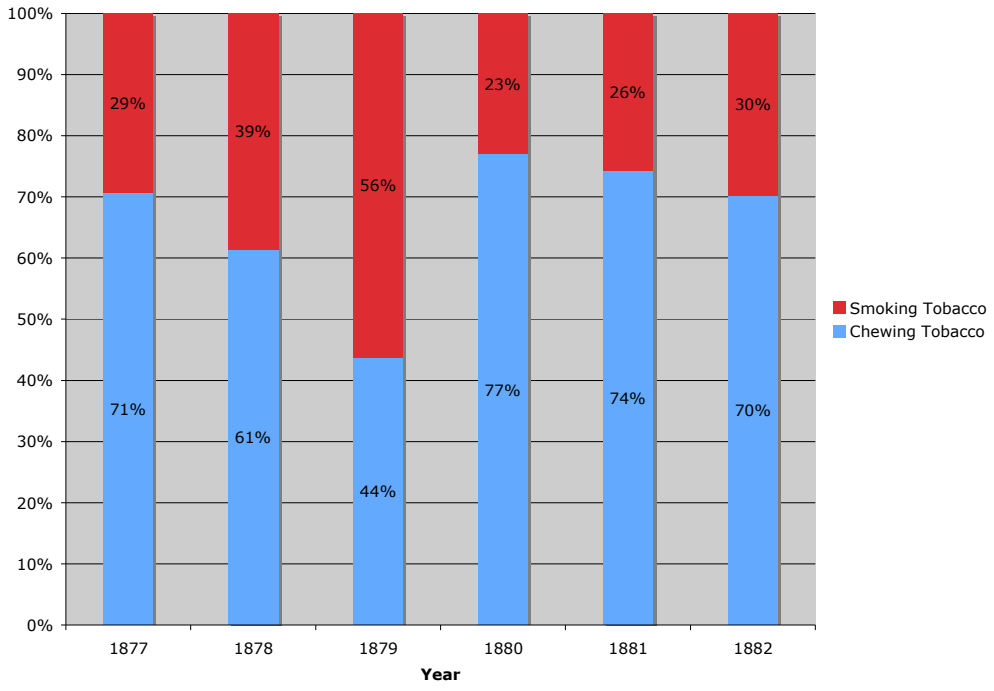


Figure 15. Ratio of chewing versus smoking tobacco sold to the U.S. Army soldiers in subsistence stores and through military rations, 1877-1882.
Source: MacFeely 1877,1878a, 1878b, 1880, 1881, 1882, 1883 (for data refer to Appendix C, Table 2)

The resulting statistics reveal that approximately 2/3 of the soldiers were taking their tobacco in the form of chewing tobacco. The complication with an analysis of this type is the "human choice" variable. During 1877-1879 the statistic recorded is only of those that chose to purchase tobacco with cash and excludes the sales of tobacco paid for with credit. Even so, it is clear that there was a significant preference for chewing tobacco versus smoking tobacco. This may be the result of the quality of tobacco available for purchase. Regulations state that tobacco "of a quality equal to that known as 'navy plug' and smoking tobacco of a standard grade" would be furnished by the Subsistence Department (Eaton 1873:171). "Navy Plug" was the preferred blend of chewing tobacco and was approximately 35% less expensive than the smoking tobacco provided for sale.

Soldiers would have been greatly affected by the cost of commodities such as tobacco because of their fixed income of thirteen dollars a month. Eddie Matthews, of the Eighth Cavalry, 1874, explained in detail how enlisted men spent what money they received. Of the thirteen dollars per month enlisted men were paid, there were many necessities such as combs, brushes, laundry and barber bills, and Matthews says:

> …another little necessity and indespensible article is tobacco, most every soldier uses it. It is one of the greatest comforts we enjoy. . . . Cigars are too expensive and Uncle Sam has failed to supply us with pipes, so you see this is an expense that could not possibly be avoided (Matthews April 13, 1874).

Even with the hardship of tobacco expenses, the soldiers continued to take their tobacco rations. Both officers and enlisted men were only permitted to purchase one pound of tobacco per month, equaling twelve pounds of tobacco annually. The annual per capita purchase of tobacco reveals that of the twelve pounds allowed per year, approximately eleven pounds were purchased (Figure 16). This is a significant statistic that demonstrates the predominance of tobacco use within the United States Army.

Translated another way, there was only one month of the year that all service personnel did not purchase their designated tobacco allotment, a very unlikely scenario. This figure of the annual per capita sale of tobacco also illustrates the significant preference for chewing tobacco over that of smoking tobacco.

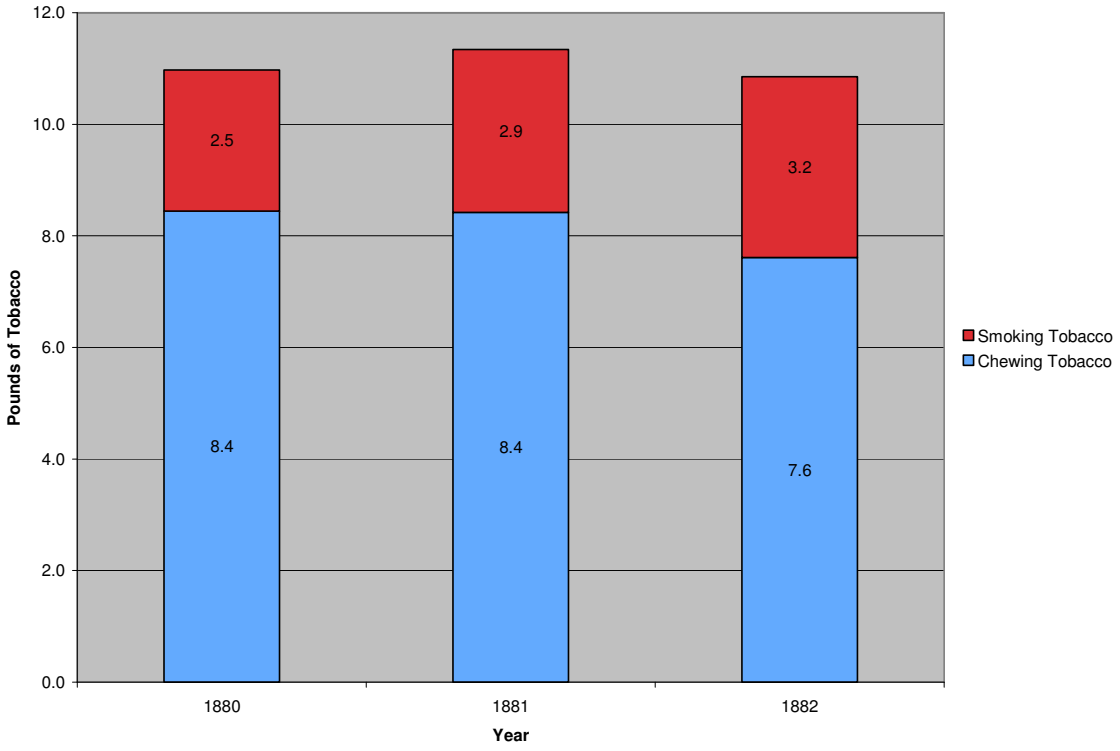


Figure 16. Annual per capita Army sales of tobacco to officers and enlisted men, 1880-1882.
Sources: MacFeely 1881, 1882, 1883. (for data refer to Appendix C, Table 2)

In comparison, the general public's per capita consumption of tobacco products was significantly lower. According to Jacobstein, the per capita tobacco consumption for the American population was significantly lower than that of the soldiers in the Army. For example, the per capita tobacco consumption of the general American public in 1880 was 3.2 pounds, apposed to the 10.9 pounds per capita among the American Army (Figure 17). The statistics provided by Jacobstein do not define the American population, the indication of women versus men, or the age ranges included in the population. Women, while likely consuming a fair amount of tobacco, likely consumed far less that their male

counterparts. Children as young as eight years old were using tobacco but were likely not included in the statistics; therefore that demographic was under-represented.

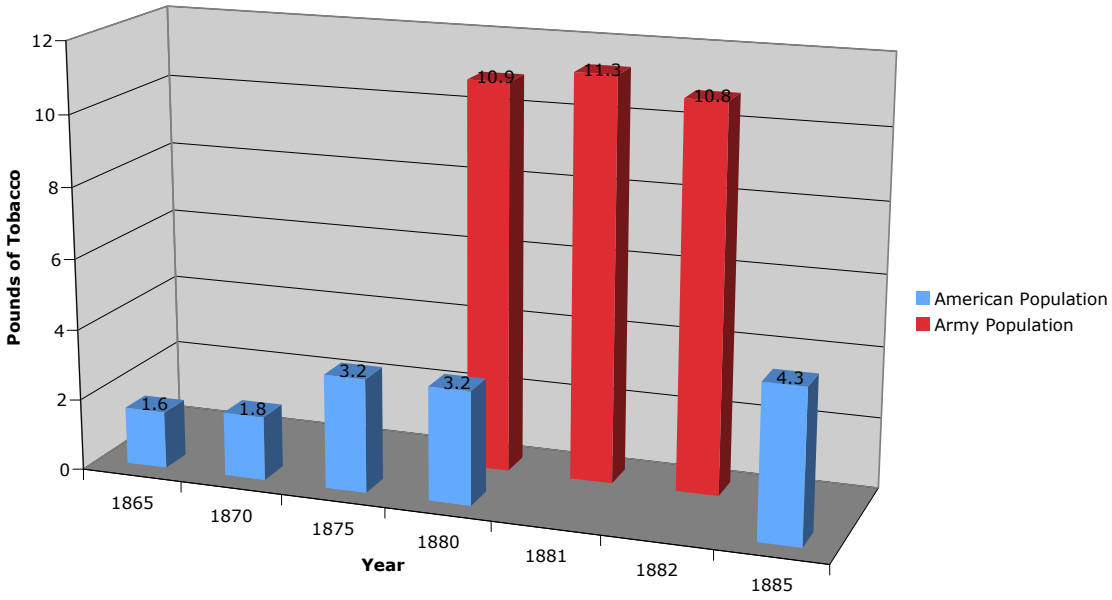


Figure 17. Annual per capita tobacco consumption by the American population compared to soldiers of the Army (Sources: Jacobstein 1907; MacFeely 1881, 1882, 1883)
Note: There was no data available for the American population per capita tobacco consumption for 1881 and 1882. There also was no data available for the Army population per capita consumption for 1865, 1870, 1875, and 1885.

The total pounds of chewing tobacco sold for the year and the total pounds of smoking tobacco sold for the year divided by twelve months gives the total individual pounds sold per month. Since the soldiers were only allotted one pound of tobacco per month, this amount divided by the total number of soldiers in the Army will provide the frequency of soldiers taking their tobacco allotment (Table 4). The figures below present the possible percentages of Army personnel who took advantage of the sale of tobacco products through the military. Although these figures are hypothetical, they also represent the highest possible percentage of soldiers indulging in tobacco use since they were only allotted one pound of tobacco per month.

Year	Pounds of Chewing Tobacco Sold	Pounds of Smoking Tobacco Sold	Total Tobacco Pounds Divided by 12 Months	Total Officers & Enlisted Men	Percentage Purchasing Tobacco
1880	223,861	67,059	24,243	26,509	91.45%
1881	216,719	75,262	24,332	25,742	94.52%
1882	195,118	83,169	23,191	25,639	90.45%

Table 4. Calculated Percentage of Tobacco Users Based on Tobacco Sales.
Sources: MacFeely 1881, 1882, 1883. (for data refer to Appendix C, Table 1, Table 2)

The high frequency of soldiers taking their tobacco ration provides a statistic of the soldiers who owed the government for tobacco rations, not necessarily those who consumed it. Men may have taken their tobacco ration but not used it themselves. There was a high demand for tobacco and some men needed more than the allotted one pound per month. In response to this need some soldiers took their rations for entrepreneurial reasons, others took their ration for an alternative form of currency, while some took their ration as a favor to their bunkmate:

> We had men in the company who would use at least three pounds of tobacco in one month. In fact, they used to gamble for tobacco. When we were in quarters and not on a campaign, each man was allowed one pound of Navy tobacco. If a man did not use it himself, he would generally draw it and sell it to his tentmate. The government price for a pound of tobacco in those days was forty-two cents, but sometimes the men got more than that for their pound of tobacco (Barnard 2001:312).

Custer himself even wished to purchase tobacco for the purposes of trade with his roommate. While at West Point, Custer wrote in a letter to his sister: "I said distinctly I did not want tobacco for myself, but for my room-mate who smokes, and would get me things I want" (Merington 1950:9). Although, Willey and Scott (1999) point out that this could have been an excuse similar to that used by today's youth who have been caught with tobacco paraphernalia by their parents.

Tobacco was also used as an alternative form of currency. There were long periods of time between pay-days, especially while on a campaign. During these periods without pay, the soldiers needed to find something else of value to fulfill the need for money to gamble. Tobacco was a natural substitute for cash since it was highly valued

by many of the soldiers. The importance tobacco played in gambling could account for the high frequency of soldiers taking their tobacco ration:

> After drawing their tobacco they would sit down and gamble for it. One of the men would be the banker. A pound plug of tobacco would be cut up into a number of small pieces, each piece being worth so many chips. The banker at the end of the game would almost always have the majority of the pieces of tobacco, and if a man lost his pound of tobacco gambling, he could buy it back again from the banker on credit, paying one dollar per pound. It would be paid to the banker on the next pay day, and that was called little pay day in the army (Barnard 2001:312).

Selling the tobacco back to the soldiers who needed it could have been considered an entrepreneurial act. Some poker players would save up their winnings (tobacco) and sell it back to nicotine-starved soldiers at ten dollars a pound:

> The ruling propensity of men who are accustomed to tobacco received a forcible illustration at this time, as one of the messengers from the fort, before dismounting, threw a long plug of chewing tobacco into the crowd, where it was soon torn to pieces and demolished; but it so happened that one man who did not succeed in getting a taste offered ten dollars to another for a single quid, which, being about the amount of a month's pay of the soldier, was, I thought, quite an extravagant offer (Harpers 1888:401).

With the price of tobacco being between $0.40 and $0.60, this would have been a significant profit. The reason soldiers would pay so much for their tobacco is because they were only allotted one pound per month, which was a far lower quantity than required by some.

This shortage of tobacco was recognized by the government as well. A *Report to the Secretary of War 1878* noted out that "16 ounces per month is not as much as a majority of enlisted men desire to purchase" and it was recommended that the limit be increased by law to 24 ounces per month. This bill was never passed and eventually, by 1885 the government ceased tobacco rations altogether, claiming that it was not a lucrative use of military resources.

> Upon investigation it furthermore appears that since the tobacco law first went into operation, up to the date of this report (1882), about $23,000 worth of tobacco has been issued to the enlisted men of the Army, the money value of which will never be transferred from the appropriations of the Pay Department to those of the Subsistence Department, owing to deaths, desertions, forfeitures, and other contingencies of service occurring after the men had drawn their tobacco and before the next pay day had arrived (Eaton 1883:471).

While the military was providing tobacco rations to the U.S. Army, there were a great number of soldiers who took advantage of the convenience and low cost of tobacco provided by the government. Even with the consideration of a handful of soldiers drawing their tobacco ration for reasons other than consuming it themselves, the number of soldiers participating in tobacco consumption is very high. The physical remains of the soldiers from the Battle of the Little Bighorn that have been examined for tobacco use show that 70% of the soldiers were using tobacco in some form. In comparison, the Muster Roll data shows that 86% of the soldiers were purchasing tobacco through the military. While these percentages are not a complete match, they do demonstrate that a significant number of soldiers were participating in tobacco consumption. The physical remains of the soldiers examined by Scott et al. (1998) are likely a direct representative sample of tobacco users in the Seventh Cavalry. With so many of the nineteenth-century military partaking in tobacco consumption, the question of why so many soldiers were using tobacco comes up. One of the goals of this thesis was to gain more insight into the daily lives of the soldiers of the Seventh Cavalry. In order to create a more holistic view of the smoking habits of the soldiers, an analysis of "why" these soldiers would have chosen the comfort of a chew or a smoke is presented.

Why Smoke?

What is it about tobacco that made it the most universally consumed article by man next to sugar? Why Smoke? This is a question that I have asked myself for many years. Despite the millions of people who have chewed, sniffed, and inhaled tobacco for

the past 500 years, there is relatively little known about why people use tobacco in the modern world. There are psychological reasons for smoking, such as boredom, stress, and relaxation just to name a few. Richard Kluger discussed some of the occasions a smoker might indulge in the vice:

> The smoker smokes when feeling up or in the dumps, when too harassed and overburdened or too unchallenged and idle, when threatened by the crowd at a party or when lonely in a strange place. A smoke is a reward for a job well done or consolation for a job botched. It can fuel the smoker for the intensity of life's daily confrontations yet seem to insulate him from the consuming effects of any given encounter (Kluger 1996:xiii).

Just about anytime is considered a good time for a smoke. Then consider the additional reasons that a soldier of the Army might smoke. The trials and hardships of war, the absence of normalcy and the desire to make the horrors of it all just disappear are a few of the added stresses felt by soldiers. Joseph C. Roberts (1967) writes that there are three predominant reasons soldiers smoke more during war: "(1) absence of family restraints, (2) indulgence by way of escape from the fatigues of military life, and (3) quickened imitativeness accompanying the massing together of people" (Roberts 1967:119). Being away from family and others who would discourage tobacco use (Roberts' reason "1") surely makes a difference as Eddie Matthews of the Eighth Cavalry, 1874, explains in one of his letters pledging to abandon "the blessedness of a chewers and smokers life." He promised to:

> break my pipe, throw away my tobacco and burn what matches I have left, and if I have strength and resolution enough quit the use of an article which has afforded me many an hours comfort, although at the same time I knew it was an injury to self to continue its use. It seems hard to throw away a friend which I have stuck to so long. And were it not for my darling Mother and Sisters I would not do it. Although it were an injury to use it. But I know they will love me more for the sacrifice and I want to do any and every thing that will please them (Matthews June 30, 1874)

Matthews knew of the harm tobacco was causing him but chose to disregard this knowledge and instead focus on the family that wished him to quit. Soldiers are under a lot of pressure (Roberts' reason"2") and tend to smoke more during periods of stress.

Perkins and Grobe (1973) have shown that there is "substantial reason to believe that desire to smoke may be increased during psychologically stressful tasks" (Perkins and Grobe 1992:1037). The mild narcotic properties of tobacco were valued for relaxation during these stressful times (Gately 2001:232). Tobacco, as Richard Klein states, "functions not to numb soldiers but to steel their nerves and to permit them to master the ambient anxiety that is their permanent condition" (Klein 1993:142). The stresses of war would certainly fall under the classification of "psychologically stressful tasks," and the stresses of simply being in the Army during war time could also be considered stressful.

There is no apparent differentiation in tobacco consumption between the soldiers of the Seventh Cavalry who were on campaigns versus the soldiers of the Seventh Cavalry that were stationed at a base. This could be correlated to Roberts' third reason which when simplified translates to "everyone else is doing it." Foss (1973) found that the "situational social factors and reference groups are important variables in smoking behavior in that they seem to induce smoking and support continuance of the habit" (Foss 1973:285). Military life has never been known for its morality or cohesiveness with temperance. Heavy drinking, laying with prostitutes, and smoking were common among Army veterans. Young recruits separated from their normal recreation were influenced by the older men in the company and took their behavior as common place. Blake (1985) states that "smoking is built into many aspects of military life" (Blake 1985:355). For instance, the fire that was lit at night for cooking and keeping warm was more likely intended to keep the tobacco aflame (Burns 2007:94). The military also used the social factors of tobacco use to create cohesiveness as Kiernan (1991) explains:

> Smoking together, like eating together in older days, could go half-way towards turning men into friends; the curling wreaths of smoke above a pair of heads might seem allegorical of an intertwining of thought and feeling. Tobacco could bring strangers into harmony, loosen tongues – less erratically than alcohol – and provide a social emollient (Kiernan 1991:117).

Tobacco use has been entwined with social rituals of bonding since its first written documentation. Many Native American tribes used tobacco in communal practices which were intended to unify the members of their society (see Paper 1988).

The social and ritualistic reasons for tobacco use were evident by the Europeans' sophistication in the actual act of smoking. Elizabethan smokers were weighted down with so much tobacco paraphernalia, including tobacco boxes, knives, tongs, and pipes that some required a "manservant" to carry them. Smoking alone was not acceptable; it needed to be accompanied by parlour tricks such as smoke rings and facial contortions. The mere act of lighting a pipe incorporated elaborate displays including passing a hot coal on the point of a sword (Gately 2001:47). Smoking was in its nature a social behavior that brought people together.

The physical reasons people smoke seem to be the most recognized in the twenty-first century. Tobacco being labeled as an addictive substance is not a development of the twenty-first century; there were many people concerned with the addictive properties of tobacco during the nineteenth century. Many entrepreneurs claimed to have invented a way of curing the tobacco of addictives by "depriving tobacco of all injurious ingredients and give it wholesome properties" (*Manufacturer and Builder* 1875). Mark Twain, an insightful storyteller of American life, was a devoted pipe and cigar smoker. Twain declared he smoked only once a day, "all day long" and he could give up smoking with ease, and had in fact done so "hundreds of times" (Campbell 1964:98). Soldiers, too, were addicted to tobacco and would go to great lengths to get it. Ami Frank Mulford, a trumpeter for the Seventh U.S. Cavalry in 1878, recorded this addiction: "Most of the men have been without this ration (tobacco) for three days, and are getting desperate. …I

have seen men nearly crazy due to their unsatisfied longing for tobacco" (Mulford 1879:89). The desperation for tobacco and its scarcity caused some soldiers to find ways of prolonging their stash buy combining the loose tobacco with coffee grounds (Barnard 2001:313).

There are many other explanations as to why people smoke now and during the nineteenth century. The explanations noted here most likely drove the use of tobacco within the military setting. The psychological calming effects of tobacco, the social pressures of peers, and the physical addiction to nicotine most likely perpetuated the use of tobacco within the military setting. Although the psychological effects of war are well documented (Gillespie 1942; Benedek 1948; Speilberger 1982), conversely, the coping mechanisms used by soldiers during the nineteenth century are not. Tobacco played a major role in everyday life of soldiers.

Chapter 6

In spite of all that has been written and spoken against Tobacco, it is likely to continue and increase in popular favour, and until our principles are so much improved, and our physique so greatly strengthened, that we can banish narcotics and stimulants altogether, we cannot (did we wish) hope to abolish the use of it.

Charles Forshaw, 1887

CONCLUSION

The goal of this research sought to identify the frequency of tobacco consumption among soldiers from the nineteenth century in an effort to gain a better understanding of soldiers lives during the nineteenth century. The soldiers who lost their lives during the Battle of the Little Bighorn were chosen as a case study to analyze tobacco use during that era. The Battle of the Little Bighorn has been documented through soldiers' manuscripts, military correspondence, and archaeological investigations, none of which specifically address the tobacco use of the soldiers of the Seventh Cavalry. The human remains examined from the Battle of the Little Bighorn exhibited a high frequency of tobacco use among the Seventh Cavalry. This information, in conjunction with the preliminary analysis of Army Muster Rolls, led me to believe that the analysis of sixteen years of Army Muster Rolls would reveal a trend of high tobacco use among the Seventh Cavalry, suggesting frequent use of tobacco by the United States military in general during the nineteenth century. While only two possibly correlated tobacco artifacts were found within the 9000 acre Little Bighorn Battlefield site, which contradicted the expectations of this research, there are possible explanations for this lack of material artifacts relating to tobacco consumption.

It has long been presumed that the Native people scavenged and stole from the dead of the Seventh Cavalry. For example, Captain Gibson wrote to his wife of the roundup of some of the Indians from the Little Bighorn Battle, noting how a pocket knife and pocket watch were recovered from two of those individuals (Fougera 1986:276). In addition, a large number of soldiers were discovered without any clothing, which had likely been taken by the Indians (Marquis 1953:7). The scavenged clothing would have contained all belongings stored in pockets (e.g. pipes, plug tobacco, match safes). Soldiers frequently sewed their most valuable possessions into the lining of their clothing or their boots (Barnard 2001:305). The members of the burial teams sent out to the battlefield were likely collecting personal items that had been overlooked by the Indians during their pilfering, with the hopes of returning them to their respective family members (Fourgero 1940:275). Soldiers themselves realized the threat of post-mortem theft and often hid their most precious possessions in their boots hoping they would go undetected by scavengers and returned to their families (Barnard 2001:305). This tactic was not always successful since boots were considered a fine commodity. The Indians likely stole the upper portion of the soldiers' boots to make moccasin soles (Barnard 2001:305).

Visitors to this famous site may also have taken souvenirs in the form of personal effects of the soldiers. It is documented that curio hunters visited the site and often dug holes looking for artifacts (Hardoff 1985:1). Therefore it is possible that the lack of tobacco-related evidence could have been taken from the site at any point between the day the battle occurred and today.

With the absence of tobacco related material artifacts available for collection, a need for alternative evidence arose. The human remains of the soldiers proved to be just as informative in inferring tobacco use as actual pipes; in fact, such remains help identify the actual smoker or chewer himself. Currently, the only skeletal remains that can contribute to our knowledge of tobacco consumption are the bones included in the skull

and the mandible. This can be a positive or negative idea depending on the type of site. On the positive side, the skull is the most recognizable and the largest part of the skeleton. During survey of a site, the skull would likely be the first set of bones recovered. The fact that the skull is the most likely to be recovered could also produce a negative result. The soldiers of the Little Bighorn battle were buried and reburied multiple times and eventurally interred in a mass grave. It is likely that this mass grave holds the valuable articles that infer tobacco use, namely their skulls. In addition, visitors to the site were known to collect souveniers in the form of bones. Indeed, a great number of Seventh Cavalry human remains from private collectors have been relinquished centuries after the battle to public organizations like the Army Medical Museum and The Smithsonian.

Private collectors are not the only culprits disturbing sites. There are other taphonomic activities that likely inhibit the availability of skeletons from the Battle of the Little Bighorn for study. Carnivores, rodents, and other scavengers would have disrupted the site by carrying off body parts, namely the extremities, for consumption. Rain, wind, and sun also likely deteriorated bones, further inhibiting informative study. These factors, along with the element of human disturbance, have resulted in very limited number of remains available for study.

The initial goal of this research sought to integrate the historical and bioarchaeological data to confirm the presence of higher than expected frequencies in tobacco consumption and to create a model for predicting the kind of physical evidence that might exist with future studies of nineteenth century soldiers. Tobacco analysis of human remains is rarely written about even though this research has concluded that 86% of the soldiers during the nineteenth century would have some form of tobacco related indicators. These indicators are contingent on the prolonged use of tobacco products and would therefore be absent from elementary tobacco users. For those soldiers who were frequent users of the plant, there would be specific types of indicators depending on the

varying types of tobacco use. Three of every four soldiers using tobacco would take their ration in the form of plug chewing tobacco. This results in a 75% chance of plug-related indicators, including tooth staining, occlusal dental attrition, and ossification of the temporal line. The remaining quarter of tobacco users would have pipe smoking indicators such as tooth staining and concave dental abrasion. To put this into a visual perspective, out of one hundred men, 85 of them would have used tobacco in some form, 64 of those men would have used chewing tobacco while 21 men would have been using smoking tobacco.

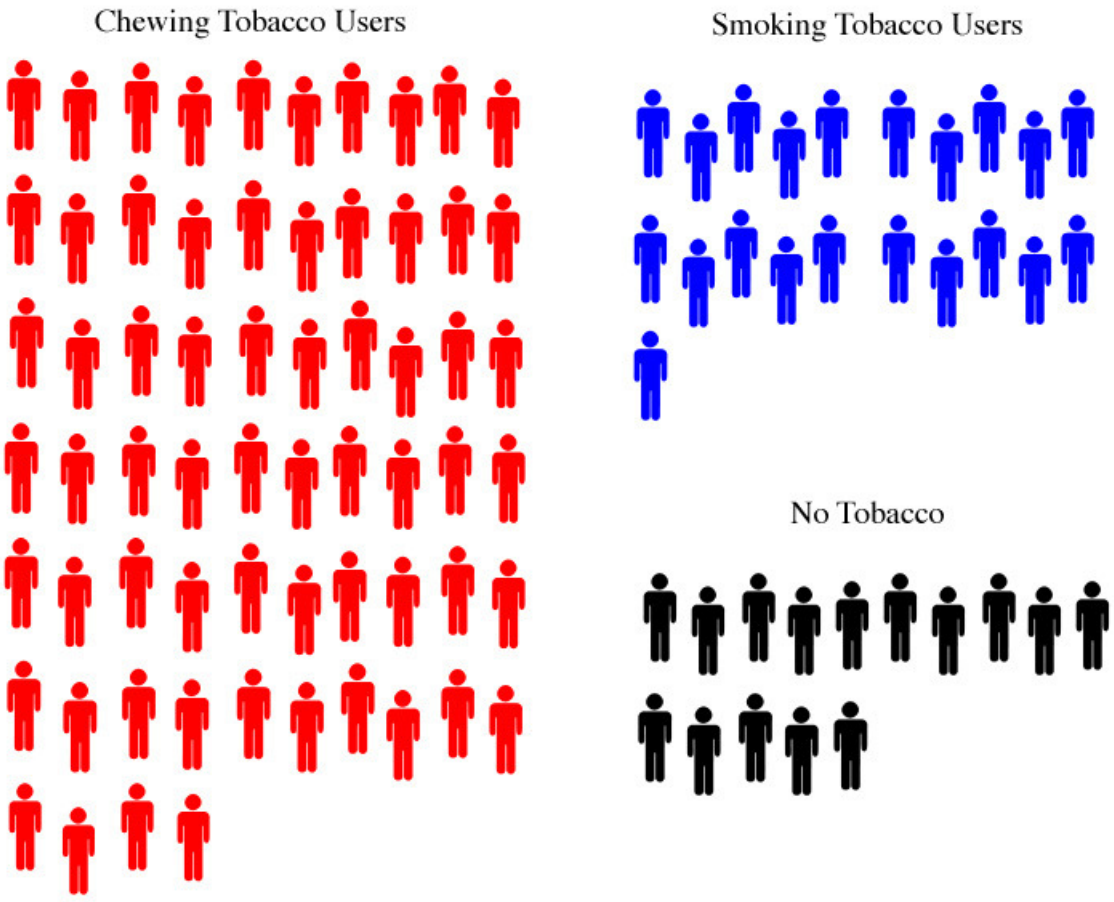


Figure 18. Visual representation of average group of 100 Seventh Cavalry soldiers' tobacco use

While historical research on tobacco did not produce a greatly desired timeline of tobacco use that would differentiate between the centuries, it did bring to light that

tobacco is deeply seeded into all societies despite extreme opposition. Tobacco has been criticized as being a gift from the devil and the producer of varying types of illnesses, yet it continues to be a popular indulgence, especially among military members. The tremendous stress associated with being a member of the armed forces has likely contributed to tobacco's continuous use. The disconnection with general society, particularly while on campaigns in the western frontier, possibly contributed to its sustainment in military culture.

Custer during the Civil War (note all but Custer are smoking)

REFERENCES

REFERENCES

Anderson, T.
2002 Unusual medieval dental abrasion. *British Dental Journal* 192(1):1-2.

Apperson, G.L.
1914 *The Social History of Smoking*. The Ballantyne Press, London.

Barnard, Sandy
1998 *Digging into Custer's Last Stand*. Ventana Graphics, Huntington Beach, CA.

2001 *Ten Years With Custer: A 7th Cavalryman's Memoirs.* Citizen Publishing, Ft. Collins.

Barnes, David S
1995 *The Making of a Social Disease: Tuberculosis in Nineteenth-Century*. University of California Press, Berkley.

Benedek, Therese
1948 *Insight and Personality Adjustment: A Study of the Psychological Effects of War*. Ronald Press Co. New York.

Black, Peter Weston
1984 The Anthropology of Tobacco Use: Tobian Data and Theoretical Issues. *Journal of Anthropological Research* 40(4): 475-503.

Blackwell, John Reid
2007 Going Smokeless: More and More Consumers Taking a Shine to Spit Tobacco. *Richmond Times-Dispatch* 9 April:F16.

Blake, Gregory H.
1985 Smoking and the Military. *New York State Journal of Medicine* 85(7):354-356.

Bowles, William H., Mitchell R. Wilkinson, Martin J. Wagner, Ronald D. Woody
1995 Abrasive Particles in Tobacco Products: A Possible Factor in Dental Attrition. *Journal of the American Dental Association*. 126 (3): 327-331.

Bray, Robert, Laurel L. Hourani, Kristine L. Rae, Jill A. Denver, Janice M. Brown, Amy A. Vincus, Michael R. Pemberton, Mary Ellen Marsden, Dorothy L. Faulkner, and Russ Vandermaas-Peeler
2003 *Highlights: 2002 Department of Defense Survey of Health Related Behaviors Among Military Personnel*. RTI International:6-1 – 6-10.

Brooks, J.E.
1952 *The Mighty Leaf*. Little Brown Co., Boston.

Burket, Lester W
1961 *Oral Medicine: Diagnosis and Treatment 4th ed*. Philadelphia: Lippincott.

Burnham, John C.
1993 *Bad Habits: Drinking, Smoking, Taking Drugs, Gambling, Sexual Misbehavior, and Swearing in American History.* New York University Press, New York.

Burns, Eric
2007 *The Smoke of the Gods: A Social History of Tobacco.* Temple University Press, Philadelphia.

Campbell, Hannah
1964 *Why Did They Name It…?.* Fleet Publishing Corporation, New York.

Christen, Arden G, Ben Z Swanson, Elbert D Glover and Allen H Henderson
1982 Smokeless tobacco: the folklore and social history of snuffing, sneezing, dipping, and chewing. *The Journal of the American Dental Association*. 105 November: 821-829.

Claver, William Louis
1950 Historical Clay Pipes. In *Written With Pick and Shovel*, William Louis Calver, Reginald Pelham Bolton, editors, pp. 280-291. New York Historical Society, New York.

Coburn,
1873 *Revised Army Regulations, March 1, 1873. –Ordered to be printed.* Serial Set Vol. No. 1576, Session Vol. No. 1:171.

Coffman, Edward M
1986 *The Old Army: A Portrait of the American Army in Peacetime, 1784-1898.* Oxford University Press, New York.

Conway, Terry L., Ross R. Vickers Jr., Harold W. Ward, and Richard H. Rahe
1981 Occupational Stress and Variation in Cigarette, Coffee and Alcohol Consumption. *Journal of Health and Social Behavior* 22(2): 155-165.

Cook, Lauren J.
1989 *Leisure Time, Tobacco Use, and Tobacco-Related Artifacts at the Boott Mills Boardinghouses, Lowell, Massachusetts.* Paper presented at the First Joint Archaeological Congress, Baltimore, MD.

Corruccini, R.S., J.S. Handler, R.J. Mutaw and F.W. Lange
1982 Osteology of a slave burial population from Barbados, West Indies. *American Journal of Physical Anthropology* 59:443-459.

Corti, Count
1932 *A History of Smoking*. Harcourt, Brace & Co., New York.

Crawford, John
1853 On the History and Consumption of Tobacco. *Journal of the Statistical Society of London* 16(1):45-52.

Curran, Daniel J. and Claire M. Renzetti
2001 *Theories of Crime 2nd Ed.* Allyn and Bacon, Boston.

Curtis, Mattoon Monroe
1935 *The Story of Snuff and Snuff Boxes*. Liveright publishing corporation, New York.

Dallal, Diane
2004 The Tudor Rose and the Fleurs-de-lis: Women and Iconography in Seventeenth-Century Dutch Clay Pipes Found in New York City. In *Smoking and Culture: The Archaeology of Tobacco Pipes in Eastern North America,* Sean M. Rafferty and Rob Mann, editors, pp. 207-239. The University of Tennessee Press, Knoxville.

Davey, P
1980 The Archaeology of the Clay Tobacco Pipe. *British Archaeological Reports* 92, Oxford.

Davies, G.N.
1963 Social Customs and Habits and Their Effect on Oral Disease. *Journal of Dental Research Supplement to No.1* 42(1): 209-232.

Delo, David M
1998 *Peddlers and Post Traders: The Army Sulter on the Frontier.* Kingfisher Book; Helena, MT.

Department of Defense
2002 *Department of Defense Survey of Health Related Behaviors Among Military Personnel.*

Dixon, Kelly J.
2004 *Boomtown Saloons: Archaeology and History in Virginia City, Nevada*. University of Nevada Press, Reno.

2006 Survival of Biological Evidence on Artifacts: Applying Forensic Techniques at the Boston Saloon, Virginia City, Nevada. In Historical Archaeology editor Julie Schablitsky 40(3): 20-30.

Dunhill, A
1969 *The Pipe Book*. Arthur Barker, London.

Eaton, A. B.
1873 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the third session of the Forty-second Congress. Volume I.* Serial Set Vol. No. 1558, Session Vol. No. 2:288-295.

1874 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the first session of the Forty-third Congress. Volume I.* Serial Set Vol. No. 1597, Session Vol. No. 2:202-208.

Eriksen, Harold M. and Hakon Nårdbø
1978 Extrinsic Discoloration of Teeth. *Journal of Clinical Periodontology* 5: 229-236.

Ferguson, Bobbie H.
1993 "…And they Laid Them to Rest in the Little Plot Beside the Pecos": Final Report on the Relocation of Old Seven Rivers Cemetery, Eddy County, New Mexico. Vols. 1 and 2. Department of Interior, Bureau of Reclamation, Denver, Colorado.

Forshaw, Charles F
1887 *A short history of tobacco: with its effect upon the general health and its influence on the teeth*. Clegg and Tetley Printers, Bradford.

Foss, Robert
1973 Personality, Social Influence and Cigarette Smoking. *Journal of Health and Social Behavior 14(3): 279-286.*

Fougera, Katherine Gibson
1986 *With Custer's Cavalry.* University of Nebraska Press, Lincoln.

Fox, Richard Allan Jr.
1993 *Archaeology, History, and Custer's Last Battle: The Little Big Horn Reexamined*. University of Oklahoma Press, Norman.

Gately, Iain
2001 *Tobacco: The Story of How Tobacco Seduced the World*. Grove Press, New York.

Gillespie, Robert Dick
1942 *Psychological Effects of War on Citizen and Soldier.* W W Norton, New York.

Gilman, Sander L., and Zhou Xun editors
2004 *Smoke: A Global History of Smoking.* Reaktion Books, London.

Golomb, Louis
1979 *Brokers of Morality: Thai Ethnic Adaptation on the Rural Malaysian Setting*. University of Hawaii Press, Honolulu.

Good, Diane L.
1986 From Resurrection to Reburial: Skeletal Remains from 14SH338, The Old Topeka Cemetery. *Journal of the Kansas Anthropological Association* 6(7-8): 120-131.

Graham, W.A.
1953 *The Custer Myth: A Source Book of Custeriana.* Bonanza Books, New York.

Haglund, William D., Donald T. Reay, and Daris R. Swindler
1989 Canid Scavenging/Disarticulation Sequence of Human Remains in the Pacific Northwest. *J Forensic Sci. 34:3 pp. 587-606.*

Haglund, William D
1997 Dogs and Coyotes: Postmortem Involvement with Human Remains. In *Forensic Taphonomy: The Postmortem Fate of Human Remains,* W.D. Haglund and M.H. Sorg, editors, pp. 367-381. CRC Press, Boca Raton, FL.

Haglund, William D., Marcella H. Sorg
1997a Introduction. In *Forensic Taphonomy: The Postmortem Fate of Human Remains*, W.D. Haglund and M.H. Sorg, editors, pp. 1-9. CRC Press, Boca Raton, FL.

1997b Method and Theory of Forensic Taphonomy Research. In *Forensic Taphonomy: The Postmortem Fate of Human Remains*, W.D. Haglund and M.H. Sorg, editors, pp. 13-26. CRC Press, Boca Raton, FL.

Haglund, William D, Melissa Connor and Douglas Scott
2002 The Effects of Cultivation on Buried Human Remains. In *Advances in Forensic Taphonomy: Method, Theory, and Archaeological Perspectives*. W.D. Haglund and M.H. Sorg, editors, pp. 133-150. CRC Press, London.

Hammer, Kenneth
1995 *Men With Custer: Biographies of the 7th Cavalry*. Custer Battlefield Historical & Museum Association, Hardin, MT.

Handler, J.S. and F.W. Lange
1979 *Plantation Slavery in Barbados: An Archaeological and Historical Investigation.* Harvard University Press, Cambridge.

Hardoff, Richard
1985 *Markers, Artifacts, and Indian Testimony: Preliminary Findings on the Custer Battle.* Don Horn Publications, Short Hills, NJ.

Harrington, J.C.
1954 Dating Stem Fragments of Seventeenth and Eighteenth Century Clay Tobacco Pipes. *Quarterly Bulletin of the Archaeological Society of Virginia* 5(4): 9-13.

Hatch, Charles E Jr.
1942 Tobacco: Its History Illustrated by the Books, Manuscripts and Engravings in the Library of George Arents, Jr., By Jerome E Brooks. *William and Mary College Quarterly Historical Magazine* 2nd Ser., 22(2) April: 101-113.

Hatch, Thom
2001 *Custer and the Battle of the Little Bighorn: An Encyclopedia of the People, Places, Events, Indian Culture and Customs, Information Sources, Art and Films.* McFarland & Co. Inc., London.

Healey, J. F.
2002 *Statistics: a tool for social research*. Thomson Learning, Belmont, CA: Wadsworth.

Hutchins, James S. editor
2003 *The Army and Navy Journal on the Battle of the Little Bighorn and Related Matters 1876-1881,* In *Custer Trails Series, vol. 8*. Upton and Sons Pub., CA.

Jacobstein, Meyer
1907 The Tobacco Industry in the United States. In *Studies in History, Economics and Public Law,* Edited by the Faculty of Political Science of Columbia University, pp. 263-470. Columbia University Press, New York.

Kell, Katharine T.
1965 Tobacco in Folk Cures in Western Society. *The Journal of American Folklore* 78(308) Apr.-Jun: 99-114.

Kiernan, V.G.
1991 *Tobacco: A History.* Hutchinson Radius, London.

Klein, Richard
1993 *Cigarettes Are Sublime.* Duke University Press, Durham.

Klein, R. G. and K. Cruz-Uribe
1984 *The Analysis of Animal Bones from Archaeological Sites.* University of Chicago Press, Chicago.

Kluger, Richard
1996 *Ashes to Ashes: America's Hundred-Year Cigarette War, the Public Health, and the Unabashed Triumph of Philip Morris*. Alfred A. Knopf, New York.

Koenig, Karl P.
2000 Pocket Match Safes Part I: Figural Match Safes. *Silver Magazine* March/April.

2000 Pocket Match Safes Part II: Enameled Pieces. *Silver Magazine* July/August.

Koskowski, W
1955 *The Habit of Tobacco Smoking.* Staples Press, London.

Kuntz, K.M.
1997 *Smoke: Cigars, Cigarettes, Pipes and other Combustibles*. Todtri, New York.

Kvaal, Sigrid I. and T.K. Derry
1996 Tell-tale teeth: abrasion from the traditional clay pipe. *Endeavour* 20(1): 28-30.

Larsen, Clark S.
1997 *Bioarchaeology: Interpreting behavior from the human skeleton* Cambridge University Press, Cambridge.

Laufer, Berthold

1924a *Tobacco and Its Use in Asia.* Field Museum of Natural History Leaflet 18. Field Museum, Chicago.

1924b *Introduction of Tobacco into Europe.* Field Museum of Natural History Leaflet 19. Field Museum, Chicago.

1930 *Tobacco and Its Use in Africa.* Field Museum of Natural History Leaflet 29. Field Museum, Chicago.

Levi-Strauss, Claude

1973 *From Honey to Ashes: Introduction to a Science of Mythology 2*, J. and D. Weightman, translator. Harper and Row, New York.

Liddic, Bruce

1979 *I Buried Custer: The Diary of Pvt. Thomas W. Coleman, 7th U.S. Cavalry.* Creative Publishing Co, College Station, TX.

Little, Barbara J., Kim M Lanphaer, Douglas W. Owsley

1992 Mortuary Display and Status in the Nineteenth-Century Anglo-American Cemetery in Manassas, Virginia. *American Antiquity 57(3): 397-418.*

MacFeely, R.

1875 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the first session of the Forty-fourth Congress. Volume I.* Serial Set Vol. No. 1674, Session Vol. No. 2:307-314.

1877 Repor*t of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the second session of the Forty-fourth Congress. Volume I.* Serial Set Vol. No. 1742, Session Vol. No. 2:299-311.

1878 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the second session of the Forty-fifth Congress. Volume I.* Serial Set Vol. No. 1794, Session Vol. No. 2:333-349.

1878 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the third session of the Forty-fifth Congress. Volume I.* Serial Set Vol. No. 1843, Session Vol. No. 2:401-421.

1880 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the second session of the Forty-sixth Congress. Volume I.* Serial Set Vol. No. 1903, Session Vol. No. 2:373-400.

1881 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the third session of the Forty-sixth Congress. Volume I.* Serial Set Vol. No. 1952, Session Vol. No. 2:483-513.

1882 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the first session of the Forty-seventh Congress. Volume I.* Serial Set Vol. No. 2010, Session Vol. No. 2:465-520.

1883 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the second session of the Forty-seventh Congress. Volume I.* Serial Set Vol. No. 2091, Session Vol. No. 2:457-468.

The Manufacturer and Builder

1872 What it Costs to use Tobacco. *The Manufacturer and Builder* 4(10) October: 220.

1875 Curious Improvement in Tobacco. *The Manufacturer and Builder* 7(1) January: 9.

Marcy, General Randolph B.

1888 Ramblings in the West. *Harpers New Monthly Magazine,* 76(453):397-405.

Marquis, Thomas

1935 *Two Days After the Custer Battle.* Privately published by author.

Matthews, William Edward

William Edward Matthews Letters. Fort Union National Monument Archives. New Mexico.

Merington, Marguerite

1950 *The Custer Story: The Life and Intimate Letters of General George A. Custer and His Wife Elizabeth*. University of Nebraska Press, Lincoln.

Milner, George R. and Clark Spencer Larsen

1991 Teeth as Artifacts of Human Behavior: Intentional Mutilation and Accidental Modification. *Advances in Dental Anthropology* pp. 357-378.

Mirbod, Sayed M. and Stephen I. Ahing
2000 Tobacco-Associated Lesions of the Oral Cavity: Part I. Nonmalignant Lesions. *Journal of the Canadian Dental Association* 66(5): 252-256.

Morris, AG
1988 Archaeological evidence of "pipe-smoker's wear". *Journal of the Dental Association of South Africa 43:361-364.*

Mulford, Ami Frank
1879 *Fighting Indians in the 7th United States Cavalry*. Paul Lindsley Mulford Corning, New York.

Oberholtzer, Ellis Paxson
1917 *A History of the United States since the Civil War Volume 1.* The Macmillan Company, New York.

Orser, Charles E., Jr.
2004 *Historical Archaeology*, 2nd Edition. Prentiss-Hall. Upper Saddle River, New Jersey.

Oswald, A
1975 Clay Pipes for the Archaeologist. *British Archaeological Reports* 14, Oxford.

Ozanne, Paul
1969 The Diffusion of Tobacco in West Africa. *Odu (Journal of West African Studies) 2:29-42.*

Page, J. Bryan and Sian Evans
2003 Cigars, Cigarellos, and Youth: Emergent Patterns in Subcultural Complexes. *Journal of Ethnicity in Substance Abuse* 2(4):63-76.

Paper, Jordan
1988 *Offering Smoke: The Sacred Pipe and Native American Religion.* University of Idaho Press, Moskow ID.

Peebles, C.S.
1977 Biocultural adaptation in pre-historic America: An archaeologists' perspective In RL Blakely (ed.), *Biocultural Adaptation in Prehistoric America.* The University of Georgia Press, Athens pp. 115-130.

Penn, W.A.
1901 *The Soverane Herbe: A History of Tobacco*. E.P. Dutton & Co, New York.

Perkins, Kenneth A and James E. Grobe
1992 Increased desire to smoke during acute stress. *British Journal of Addiction* 87:1037-1040.

Poland, B et al.
2006 The Social Context of Smoking: the next frontier in tobacco control? *Tobacco Control* 15:56-63.

Reckner, Paul
2004 Home Rulers, Red Hands, and Radical Journalists: Clay Pipes and the Negotiation of Working Class Irish/Irish American Identity in Late-Nineteenth-Century Paterson, New Jersey. In *Smoking and Culture: The Archaeology of Tobacco Pipes in Eastern North America,* Sean Rafferty and Rob Mann, editors, pp. 241-271. University of Tennessee Press, Knoxville.

Rickey Jr, Don
1963 *Forty Miles a Day on Beans and Hay: The Enlisted Fighting the Indian Wars.* University of Oklahoma Press, Norman.

Robert, Joseph C.
1967 *The Story of Tobacco in America.* The University of North Carolina Press, Chapel Hill, NC.

Robertson, P.B., M.M. Walsh and J.C. Greene
1997 Oral Effects of Smokeless Tobacco Use by Professional Baseball Players. *Adv Dent Res* 11(3): 307-312.

Rodu, Brad
1995 *For Smokers Only: How Smokeless Tobacco Can Save Your Life.* Sulzburger & Graham Publishing, Woodmere, NY.

Rogozinski, Jan
1990 *Smokeless Tobacco in the Western World: 1550-1950*. Praeger Publishers, New York.

Routh, Hirak B, Kazal Bhowmik, Jennifer L Parish and Lawrence C Parish
1998 Historical Aspects of Tobacco Use and Smoking. *Clinics in Dermatology*. 16: 539-544.

Sapundzhiev, Nikolay and Jochen Alfred Werner
2003 Nasal snuff: historical review and health related aspects. *The Journal of Laryngology & Otology* 117: 686-691.

Sawatsky, Rick Pamela A. Ratner, Joy L. Johnson, Sheila Marhall
2007 Toward an Explanation of Observed Ethnic Differences in Youths' Tobacco Use. *Journal of Ethnicity in Substance Abuse* 6(3):95-112.

Scott, Douglas, Melissa Connor and Clyde Snow
1988 Nameless Faces of Custer Battlefield. *Greasy Grass* 4:2-5.

Scott, Douglas D., Richard A. Fox Jr.
1987 *Archaeological Insights into The Custer Battle: An Assessment of the 1984 Field Season.* University of Oklahoma Press, Norman.

Scott, Douglas D., Richard A. Fox Jr., Melissa A. Connor, Dick Harmon
1989 *Archaeological Perspectives on the Battle of the Little Bighorn*. University of Oklahoma Press, Norman.

Scott, Douglas D., and Clyde Collins Snow
1991 Archeology and Forensic Anthropology of the Human Remains from the Reno Retreat Crossing. In *Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7 and the Reno Crossing,* ed. Douglas Scott, 207-236.

Scott, Douglas D., P. Willey
1997 Little Bighorn: Human Remains from the Custer National Cemetery In *In Remembrance: Archaeology and Death*, David A. Poirier and Nicholas F. Bellantoni, editors, pp. 155-171. Bergin & Garvey, Westport Conn.

Scott, Douglas D., P. Willey, Melissa A. Connor
1998 *They Died with Custer: Soldiers' Bones from the Battle of the Little Bighorn.* University of Oklahoma Press, Norman.

Scott, Hugh Lenox
1928 *Some Memories of a Soldier.* The Century Co., New York.

Shiras, A. E.
1877 *Report of the Secretary of War, being part of the message and documents communicated to the two Houses of Congress at the beginning of the second session of the Forty-third Congress. Volume I.* Serial Set Vol. No. 1635, Session Vol. No. 2:221-225.

Sledzik, Paul S. and Peer H. Moore-Jansen
1991 Dental Disease in Nineteenth Century Military Skeletal Samples. *Advances in Dental Anthropology* p. 215-224.

Spielberger, Charles, Irwin Sarason, Norman Milgram
1982 *Psychological Stress and Adjustment in Time of War and Peace.* Hemisphere Pub Corp.

Stolberg, Victor B
2007 A Cross-Cultural and Historical Survey of Tobacco Use Among Various Ethnic Groups. *Journal of Ethnicity in Substance Abuse* 6(3):9-80

Stone, Robert J. and Judith A. Stone
2003 *Atlas of Skeletal Muscles 4th edition.* McGraw Hill, Boston.

Stones, Hubert H., E. Desmond Farmer and Frank E. Lawton
1966 *Stones' Oral and Dental Diseases: Aetiology, Histopathology, Clinical Features and Treatment, 5th Edition.* The Williams and Wilkins Company, Baltimore.

Storino, Louis
1995 *Chewing Tobacco Tin Tags 1870-1930*. Schiffer Publishing Ltd, Atglen, PA.

Sullivan, Audrey G.
1978 *A History of Match Safes in the United States*. Riverside Press, Ft. Lauderdale.

Taylor, William O.
1996 *With Custer on the Little Bighorn: The First – And Only – Eyewitness Account Ever Written.* Penguin Books, New York.

Terneny, Tiffany T.
1997 *Estimation of time since death in humans using mature pigs*. University of Montana Thesis.

Ubelaker, Douglas H.
1996 Pipe Wear: Dental Impact of Colonial American Culture. *Anthropologie 34(3): 321-327.*

United States Bureau of the Census
1860 United States Census of Manufacturing: 1860. U.S. Department of Commerce: Bureau of the Census, Washington D.C.

Utley, Robert M.
1999 Battle of the Little Bighorn In *The Oxford Companion to American Military History.* Edt. John Whiteclay Chambers II, editor, pp. 397. Oxford University Press, Oxford.

Von Gernet, Alexander
1995 Nicotian Dreams: The prehistory and early history of tobacco in eastern North America. In *Consuming Habits: Drugs in History and Anthropology,* Jordan Goodman, Paul E. Lovejoy, Andrew Sherratt, editors, pp. 67-87. Routledge. London.

2000 Origins of Nicotine Use and the Global Diffusion of Tobacco. In *Nicotine and Public Health,* Ferrence G. Roberta, John Slade, Robin Room, Marilyn Pope, editors, pp. 3-17. American Public Health Association, Washington DC.

Van Lancker, Julien L.
1977 Historical Sketch of the Discovery and the Spread of Tobacco. *National Institute on Drug Abuse, Monograph* 17:230-238. Rockville, MD.

Watts, A. and M. Addy
2001 Tooth discolouration and staining: a review of the literature. *British Dental Journal* 190: 309-316.

Wells, David A.
1890 *Recent Economic Changes: and their effect on the production and distribution of wealth and the well-being of society.* D Appleton and Co., New York.

White, Tim D.
2000 *Human Osteology, Second Edition.* Academic Press, New York.

Willey, P.
1997 *Osteological Analysis of Human Skeletons Excavated from the Custer National Cemetery.* Technical Report no. 50. National Park Service, Midwest Archaeological Center, Lincoln, Nebraska.

Willey, P., Richard A. Glenner and Douglas D. Scott
1996 Oral Health of Seventh Cavalry Troopers: Dentitions from the Custer National Cemetery. *Journal of the History of Dentistry 44(1): 3-14.*

Willey, P., Douglas D. Scott
1999 Who's Buried in Custer's Grave?. *Journal of Forensic Sciences*, May:656-664.

APPENDICES

APPENDIX A

TOBACCO RATION SPREADSHEETS

Table 1. Tobacco Ration due the U.S. Government for May-June 1867, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff					
A	0	no record			
B	83	11	13.3%	72	86.7%
C	76	12	15.8%	64	84.2%
D	70	7	10.0%	63	90.0%
E	84	12	14.3%	72	85.7%
F	80	0	0.0%	80	100.0%
G	55	6	10.9%	49	89.1%
H	0	no record			
I	0	no record			
K	82	10	12.2%	72	87.8%
L	0	no record			
M	64	13	20.3%	51	79.7%

Table 2. Tobacco Ration due the U.S. Government for May-June 1868, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	23	6	26.1%	17	73.9%
A	65	9	13.8%	54	83.1%
B	76	8	10.5%	68	89.5%
C	70	6	8.6%	64	91.4%
D	68	10	14.7%	58	85.3%
E	84	21	25.0%	63	75.0%
F	83	10	12.0%	73	88.0%
G	69	6	8.7%	63	91.3%
H	81	14	17.3%	67	82.7%
I	76	15	19.7%	61	80.3%
K	67	6	9.0%	61	91.0%
L	70	53	75.7%	17	24.3%
M	75	3	4.0%	66	88.0%
Total	907	167	18.4%	732	80.7%

Table 3. Tobacco Ration due the U.S. Government for May-June 1869, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	23	6	26.1%	17	73.9%
A	58	14	24.1%	44	75.9%
B	67	13	19.4%	54	80.6%
C	61	12	19.7%	49	80.3%
D	68	10	14.7%	58	85.3%
E	75	18	24.0%	57	76.0%
F	67	5	7.5%	62	92.5%
G	60	7	11.7%	53	88.3%
H	66	13	19.7%	53	80.3%
I	65	8	12.3%	57	87.7%
K	59	5	8.5%	54	91.5%
L	82	23	28.0%	59	72.0%
M	56	9	16.1%	44	78.6%
Total	807	143	17.7%	661	81.9%

Table 4. Tobacco Ration due the U.S. Government for May-June 1870, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	32	13	40.6%	19	59.4%
A	90	11	12.2%	79	87.8%
B	68	10	14.7%	58	85.3%
C	83	14	16.9%	69	83.1%
D	83	13	15.7%	70	84.3%
E	64	17	26.6%	47	73.4%
F	86	11	12.8%	75	87.2%
G	81	14	17.3%	67	82.7%
H	65	9	13.8%	56	86.2%
I	85	22	25.9%	63	74.1%
K	85	6	7.1%	79	92.9%
L	75	6	8.0%	69	92.0%
M	78	16	20.5%	62	79.5%
Total	975	162	16.6%	813	83.4%

Table 5. Tobacco Ration due the U.S. Government for May-June 1871, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	26	14	53.8%	12	46.2%
A	76	16	21.1%	58	76.3%
B	82	7	8.5%	75	91.5%
C	82	12	14.6%	70	85.4%
D	80	17	21.3%	63	78.8%
E	80	12	15.0%	68	85.0%
F	84	14	16.7%	70	83.3%
G	82	8	9.8%	74	90.2%
H	84	15	17.9%	69	82.1%
I	83	28	33.7%	55	66.3%
K	79	9	11.4%	70	88.6%
L	93	5	5.4%	88	94.6%
M	92	16	17.4%	76	82.6%
Total	1023	173	16.9%	848	82.9%

Table 6. Tobacco Ration due the U.S. Government for May-June 1872, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	22	10	45.5%	12	54.5%
A	57	10	17.5%	47	82.5%
B	73	8	11.0%	65	89.0%
C	77	7	9.1%	70	90.9%
D	63	7	11.1%	56	88.9%
E	66	12	18.2%	54	81.8%
F	73	9	12.3%	64	87.7%
G	71	3	4.2%	68	95.8%
H	77	18	23.4%	59	76.6%
I	68	9	13.2%	59	86.8%
K	77	8	10.4%	69	89.6%
L	72	4	5.6%	68	94.4%
M	62	11	17.7%	51	82.3%
Total	858	116	13.5%	742	86.5%

Table 7. Tobacco Ration due the U.S. Government for May-June 1873, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	21	12	57.1%	9	42.9%
A	65	9	13.8%	56	86.2%
B	62	6	9.7%	56	90.3%
C	56	7	12.5%	49	87.5%
D	71	13	18.3%	58	81.7%
E	62	6	9.7%	56	90.3%
F	73	10	13.7%	63	86.3%
G	68	3	4.4%	65	95.6%
H	76	17	22.4%	59	77.6%
I	76	13	17.1%	63	82.9%
K	67	6	9.0%	61	91.0%
L	68	1	1.5%	67	98.5%
M	52	11	21.2%	41	78.8%
Total	817	114	14.0%	703	86.0%

Table 8. Tobacco Ration due the U.S. Government for May-June 1874, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	19	4	21.1%	15	78.9%
A	62		0.0%		0.0%
B	65	8	12.3%	57	87.7%
C	66	2	3.0%	64	97.0%
D	77	10	13.0%	67	87.0%
E	70	7	10.0%	63	90.0%
F	73	10	13.7%	63	86.3%
G	70	4	5.7%	66	94.3%
H	79	5	6.3%	74	93.7%
I	79	12	15.2%	67	84.8%
K	65	9	13.8%	56	86.2%
L	76	11	14.5%	65	85.5%
M	72	7	9.7%	65	90.3%
Total	873	89	10.2%	722	82.7%

Table 9. Tobacco Ration due the U.S. Government for May-June 1875, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	18	5	27.8%	13	72.2%
A	62	7	11.3%	55	88.7%
B	59	6	10.2%	53	89.8%
C	48	3	6.3%	45	93.8%
D	59	7	11.9%	52	88.1%
E	69	7	10.1%	62	89.9%
F	56	4	7.1%	52	92.9%
G	62	5	8.1%	57	91.9%
H	67	3	4.5%	64	95.5%
I	64	5	7.8%	59	92.2%
K	61	12	19.7%	49	80.3%
L	67	7	10.4%	60	89.6%
M	54	9	16.7%	45	83.3%
Total	746	80	10.7%	666	89.3%

Table 10. Tobacco Ration due the U.S. Government for May-June 1876, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	22	8	36.4%	14	63.6%
A	59	2	3.4%	57	96.6%
B	71	6	8.5%	65	91.5%
C	67	1	1.5%	66	98.5%
D	66	5	7.6%	61	92.4%
E	60	3	5.0%	57	95.0%
F	68	9	13.2%	59	86.8%
G	65	7	10.8%	58	89.2%
H	55	0	0.0%	55	100.0%
I	65	6	9.2%	59	90.8%
K	68	1	1.5%	67	98.5%
L	67	6	9.0%	61	91.0%
M	63	5	7.9%	58	92.1%
Total	796	59	7.4%	737	92.6%

Table 11. Tobacco Ration due the U.S. Government for May-June 1877, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	20	0	0.0%	20	100.0%
A	72	6	8.3%	66	91.7%
B	75	10	13.3%	65	86.7%
C	88	2	2.3%	86	97.7%
D	65	11	16.9%	54	83.1%
E	85	12	14.1%	73	85.9%
F	85	7	8.2%	78	91.8%
G	86	11	12.8%	75	87.2%
H	66	1	1.5%	65	98.5%
I	92	16	17.4%	76	82.6%
K	85	6	7.1%	79	92.9%
L	94	12	12.8%	82	87.2%
M	84	10	11.9%	74	88.1%
Total	997	104	10.4%	893	89.6%

Table 12. Tobacco Ration due the U.S. Government for May-June 1878, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	24	5	20.8%	19	79.2%
A	51	0	0.0%	51	100.0%
B	53	3	5.7%	50	94.3%
C	68	7	10.3%	61	89.7%
D	49	2	4.1%	47	95.9%
E	48	2	4.2%	46	95.8%
F	67	2	3.0%	65	97.0%
G	65	4	6.2%	61	93.8%
H	49	0	0.0%	49	100.0%
I	68	3	4.4%	65	95.6%
K	51	3	5.9%	48	94.1%
L	71	3	4.2%	68	95.8%
M	52	2	3.8%	50	96.2%
Total	716	36	5.0%	680	95.0%

Table 13. Tobacco Ration due the U.S. Government for May-June 1879, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	26	7	26.9%	17	65.4%
A	54	3	5.6%	51	94.4%
B	57	7	12.3%	50	87.7%
C	68	1	1.5%	67	98.5%
D	58	3	5.2%	55	94.8%
E	59	4	6.8%	55	93.2%
F	65	3	4.6%	62	95.4%
G	61	9	14.8%	52	85.2%
H	57	3	5.3%	54	94.7%
I	63	3	4.8%	60	95.2%
K	65	6	9.2%	59	90.8%
L	67	9	13.4%	58	86.6%
M	66	1	1.5%	65	98.5%
Total	766	59	7.7%	705	92.0%

Table 14. Tobacco Ration due the U.S. Government for May-June 1880, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	22	5	22.7%	17	77.3%
A	58	2	3.4%	56	96.6%
B	62	10	16.1%	52	83.9%
C	71	8	11.3%	63	88.7%
D	58	5	8.6%	53	91.4%
E	66	9	13.6%	57	86.4%
F	64	10	15.6%	54	84.4%
G	59	11	18.6%	48	81.4%
H	58	1	1.7%	57	98.3%
I	61	6	9.8%	55	90.2%
K	67	4	6.0%	63	94.0%
L	65	6	9.2%	59	90.8%
M	61	3	4.9%	58	95.1%
Total	772	80	10.4%	692	89.6%

Table 15. Tobacco Ration due the U.S. Government for May-June 1881, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	21	4	19.0%	17	81.0%
A	56	3	5.4%	53	94.6%
B	55	6	10.9%	49	89.1%
C	67	17	25.4%	50	74.6%
D	62	4	6.5%	58	93.5%
E	63	16	25.4%	47	74.6%
F	61	4	6.6%	57	93.4%
G	53	14	26.4%	39	73.6%
H	55	2	3.6%	53	96.4%
I	69	12	17.4%	57	82.6%
K	61	10	16.4%	51	83.6%
L	59	14	23.7%	45	76.3%
M	57	4	7.0%	53	93.0%
Total	739	110	14.9%	629	85.1%

Table 16. Tobacco Ration due the U.S. Government for May-June 1882, for the Seventh Cavalry

Co.	Enlisted Men	Not Due		Due	
	Number	Number	Percentage	Number	Percentage
Field & Staff	21	5	23.8%	16	76.2%
A	55	3	5.5%	52	94.5%
B	49	8	16.3%	41	83.7%
C	55	10	18.2%	45	81.8%
D	50	10	20.0%	40	80.0%
E	53	10	18.9%	43	81.1%
F	52	3	5.8%	49	94.2%
G	57	10	17.5%	47	82.5%
H	51	15	29.4%	36	70.6%
I	47	1	2.1%	46	97.9%
K	46	3	6.5%	43	93.5%
L	43	3	7.0%	40	93.0%
M	51	21	41.2%	30	58.8%
Total	630	102	16.2%	528	83.8%

Table 17. Tobacco Ration due the U.S. Government for 1867-1882, for the Seventh Cavalry

Year	Enlisted Men	Not Due		Due	
	Total	Number	Percentage	Number	Percentage
1867	594	71	12.0%	523	88.0%
1868	907	167	18.4%	732	80.7%
1869	807	143	17.7%	661	81.9%
1870	975	162	16.6%	813	83.4%
1871	1023	173	16.9%	848	82.9%
1872	858	116	13.5%	742	86.5%
1873	817	114	14.0%	703	86.0%
1874	873	89	10.2%	722	82.7%
1875	746	80	10.7%	666	89.3%
1876	796	59	7.4%	737	92.6%
1877	997	104	10.4%	893	89.6%
1878	716	36	5.0%	680	95.0%
1879	766	59	7.7%	705	92.0%
1880	772	80	10.4%	692	89.6%
1881	739	110	14.9%	629	85.1%
1882	630	102	16.2%	528	83.8%
Total	13016	1665	12.8%	11274	86.6%

APPENDIX B

UNITED STATES PATENT OFFICE – SANITARY POCKET SPITTOON

G. STEINKE.

SANITARY POCKET SPITTOON.

APPLICATION FILED FEB. 7, 1911.

1,012,471. Patented Dec. 19, 1911.

Fig. 1.

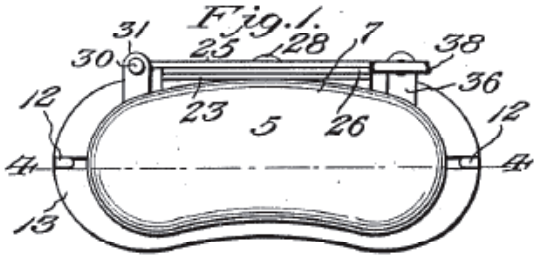


Fig. 2.

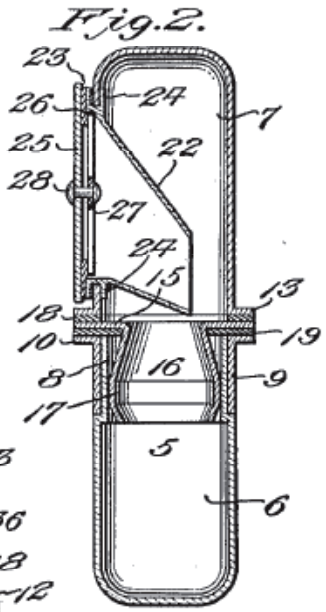


Fig. 3.

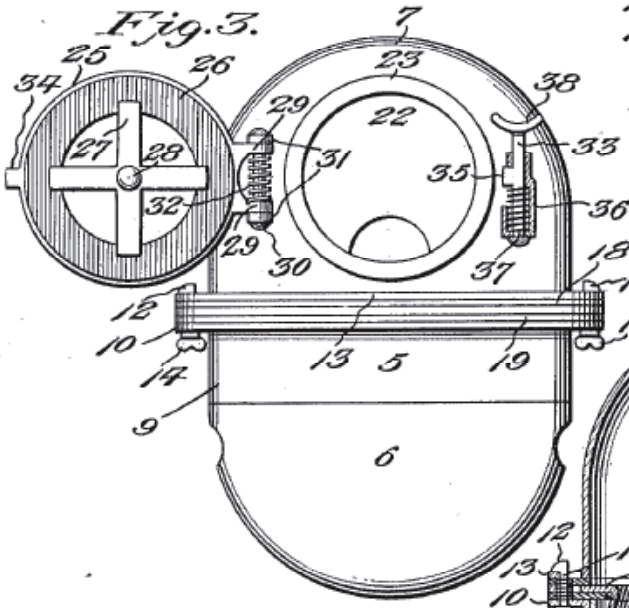


Fig. 4.

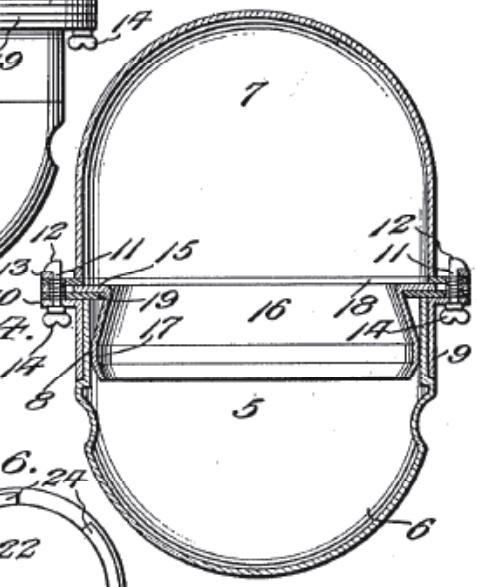


Fig. 5.

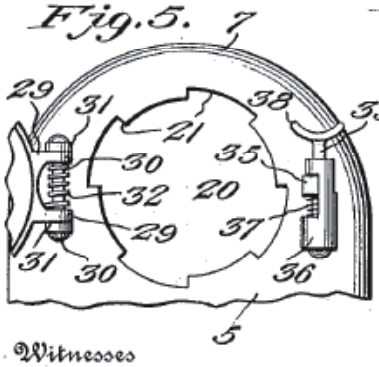
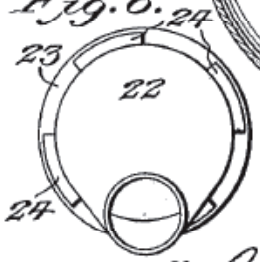


Fig. 6.



Witnesses

Edwin L. McKee

H. O. Parker

Inventor

Gustave Steinke

By Victor J. Evans

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GUSTAVE STEINKE, OF DENVER, COLORADO.

SANITARY POCKET-SPITTOON.

1,012,471. Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed February 7, 1911. Serial No. 607,062.

To all whom it may concern:

Be it known that I, GUSTAVE STEINKE, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented new and useful Improvements in Sanitary Pocket-Spittoons, of which the following is a specification.

The invention relates to cuspidors, and more particularly to the class of pocket spittoons.

The primary object of the invention is the provision of a device of this character in which saliva expectorated by a person afflicted with tuberculosis or other contagious or infectious diseases may be caught and confined, thereby preventing the exposure of such saliva to other persons, thus overcoming the possibility of the spreading of such diseases.

Another object of the invention is the provision of a spittoon in which the user thereof may carry the same in the pocket of wearing apparel for the convenience of a person suffering with consumption or other infectious diseases, whereby when it is desired to expectorate, the saliva may be caught in the spittoon and confined thereby, thus obviating objectionable exposure or escape of the saliva which would necessarily result in the spreading of such diseases.

A further object of the invention is the provision of a spittoon in which an invalid may conveniently carry the same, whereby it may be readily handled for receiving sputum or saliva as expectorated by the invalid, the spittoon being readily and easily cleaned, thus assuring sanitary conditions thereto, and when saliva is confined within the same, it will obviate the objectionable exposure thereof, thus preventing the spreading of infectious or contagious diseases.

A still further object of the invention is the provision of a device of this character which is simple in construction, readily and easily carried in the pocket of wearing apparel worn by the user, thereby making the same convenient and accessible to such user, and also one that is thoroughly reliable and efficient in its purpose, and inexpensive in manufacture.

With these and other objects in view, the invention consists in the construction, combination, and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is an end elevation of the cuspidor constructed in accordance with the invention. Fig. 2 is a vertical longitudinal sectional view therethrough. Fig. 3 is a top plan view, showing the hinged lid or cover opened. Fig. 4 is a sectional view on the line 4—4 of Fig. 1. Fig. 5 is a fragmentary top plan view with the funnel removed. Fig. 6 is a bottom plan view of the funnel when removed from the casing.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings by numerals, the spittoon comprises a slightly arched substantially flat oval-shaped hollow body 5, including separable sections 6 and 7, respectively, the section 6 being formed with a contracted flange 8, providing an external seat in which is engaged a detachable flange 9 which is adapted to telescope over the flange 8 when the two sections have been connected and rests in the seat formed in the section 6. This flange 9 is provided with an outturned rim 10 at diametrical points of which and engaged therein are keys 11, the same being provided with hook ends 12, and these keys are adapted to be passed through suitable openings formed in an outturned rim 13 on the section 7, the hook ends 12 of the keys 11 engaging the said rim 13 for the locking of the flange 9 to the section 7. The keys 11 are also provided with winged knobs 14 which enable the turning thereof, when it is desired to unlock the flange 9 from the section 7 of the body.

Interposed between the rim 10 of the flange 9 and the rim 13 of the section 7 is an outturned head or flange 15 of an inner yieldable gripping ring 16, the same being provided with an outward bulge 17 to frictionally engage the inner face of the contracted rim 8 of the section 6, thus holding the section 7 connected.

Arranged between the outturned head or flange 15 of the ring 16, and the rims 10 and 13 of the flange 9 and section 7, respectively, are rubber gaskets 18 and 19 which serve to form a fluid tight juncture between the head and rims, the gasket 19 being adapted to contact with the free edge of the rim 8 of the section 6, thereby forming a fluid tight joint

between the separable sections of the body. The section 7 in its top wall is formed with a circular opening 20 having in its edge at intervals notches 21, and into this opening is removably fitted an inwardly and rearwardly extending funnel 22, the same being formed with an outturned annular flange 23 adapted to rest upon the top of the section 7 while beneath this flange are provided locking tongues 24, the latter being correspondingly shaped to the notches 21, so as to permit the tongues to pass therethrough and frictionally bind upon the inner face of the top of the section 7 on the turning of the funnel 22, whereby it may be locked in position in the section 7, the inner end of the funnel 22 being terminated, spaced from the bottom wall of the section 7, and this funnel is adapted to direct the saliva into the section 6 of the body of the spittoon when sputum or saliva is introduced through the funnel in the section 7 into the said body.

Normally resting upon the annular flange 23 of the funnel is a closure cap or lid 25, the same carrying at its inner face a rubber gasket or washer 26, which is held in position thereon by means of a spider 27 secured to the cap or lid 25 through the medium of a nail 28 passed centrally through the said spider and the said lid or cap. Thus it will be seen that when the lid or cap 26 is in position for closing the funnel, the washer or gasket 26 will effect a fluid tight joint between the said lid or cap and the annular flange 23 on the funnel 22, when the latter is fixed in the section 7 of the body. This lid or cap 25 is provided with spaced parallel ears 29, through which is passed a pintle or pivot pin 30, the latter being also passed through bearings 31 suitably formed on the top wall of the section 7. In this manner, the lid or cap 25 is hinged to the spider 27, whereby it may be swung to open or closed position. Surrounding the pintle or pivot pin 30 is a coiled expansion spring 32, one end of which is engaged with one bearing 29, while its other end engages one ear 31, so that the lid or cap 25 will automatically swing to open position by the action of said spring, when it has been released in a manner, as will be hereinafter more fully described.

The lid or cap 25 is sustained in closed position by means of the sliding catch bolt 33 when engaged therewith, the said cap or lid 25 being formed with a lip 34 adapted to engage with an offset tongue 35 formed on the bolt 33, the tongue 35 being projected through a suitable slot formed in a housing 36, in which the bolt 33 is slidably fitted, the housing 36 being formed on the top wall of the section 7. Surrounding the bolt 33 is a coiled expansion spring 37, the same being confined within the housing 36, and one end thereof works against one end of the housing, while its opposite end works against the offset lug or tongue 35 on the bolt, so that the latter will be sustained in a position for locking the cap or lid 25 in closed position. One end of this bolt 33 is formed with a finger knob 38 which is adapted to be manipulated by an operator for moving the bolt in a position whereby its tongue or lug 35 will disengage from the lip 34 on the lid or cap 25, so that the latter when unlocked will automatically swing to open position by the action of the said spring 32, without requiring the user of the spittoon to manually lift the lid or cap for this purpose. When it is desired to close the spittoon, it will be necessary to manually shut the lid.

From the foregoing, it is thought that the construction and operation of the invention will be readily understood, without requiring a more extended explanation, and therefore the same has been omitted.

What is claimed is:

1. A spittoon of the class described, comprising a body having separable sections, one of said sections being formed with a contracted portion forming a seat, a separable flange removably engaged in said seat and detachably connected with the other section, an inner yielding gripping rim having an outturned flange interposed between the sections and frictionally engaged with the contracted portion of one of said sections, a funnel detachably connected to one of the sections, and a lid adapted to close said funnel.

2. A spittoon of the class described, comprising a body having separable sections, one of said sections being formed with an outturned flange, the other section being provided with a contracted portion forming a seat, a rim telescoping upon the contracted portion and engaging the seat formed thereby, an outturned flange formed on the said rim, catch devices passed through the flanges of the rim and said section, respectively, for locking the same together, an inner yieldable ring having an outturned portion detachably engaged by said devices and interposed between the flanges of the section and rim, the said ring being adapted to frictionally engage the contracted portion of one section, one of said sections being provided with a circular opening having notches in the wall thereof, a funnel having locking tongues engageable in the notches for locking the funnel in the section, a lid adapted to close said funnel and pivotally connected to the section supporting the same, and a spring latch for engagement with the lid to hold the same in closed position.

3. A spittoon of the class described, comprising a body having separable sections, one of said sections being formed with an

outturned flange, the other section being provided with a contracted portion forming a seat, a rim telescoping upon the contracted portion and engaging the seat formed thereby, an outturned flange formed on the said rim, catch devices passed through the flanges of the rim and said section, respectively, for locking the same together, an inner yieldable ring having an outturned portion detachably engaged by said devices and interposed between the flanges of the section and rim, the said ring being adapted to frictionally engage the contracted portion of one section, one of said sections being provided with a circular opening having notches in the wall thereof, a funnel having locking tongues engageable in the notches for locking the funnel in the section, a lid adapted to close said funnel and pivotally connected to the section supporting the same, a spring latch for engagement with the lid to hold the same in closed position, and gaskets interposed between the flanges of the rim, section and ring for forming a fluid tight juncture therebetween.

In testimony whereof I affix my signature in presence of two witnesses.

GUSTAVE STEINKE.

Witnesses:
CHARLES E. CONNOLLY,
JOSEPH A. BLEB.

APPENDIX C

MISCELLANEOUS TABLES

Table 1. Actual Strength of the Regular Army of the United States, 1866-1885

Year	Enlisted Men	Officers	Total Army Force
1866	31470	2020	33490
1867	53962	2853	56815
1868	48081	2835	50916
1869	34074	2700	36774
1870	34534	2541	37075
1871	26848	2105	28953
1872	27110	2104	29214
1873	27580	2076	29656
1874	28440	2080	30520
1875	23580	2094	25674
1876	24161	2151	26312
1877	22676	2178	24854
1878	23701	2153	25854
1879	24341	2127	26468
1880	24357	2152	26509
1881	23561	2181	25742
1882	23477	2162	25639
1883	23404	2143	25547
1884	24268	2156	26424
1885	24731	2167	26898

Table 2. Subsistence Department Tobacco Sales recorded in the Report of the Secretary of War

Year	Total Tobacco Recorded on Returns	Chewing Tobacco Sold	Smoking Tobacco Sold
1873	$152,489.40		
1874	$142,999.07		
1875	$121,984.80		
1876	$127,450.11		
1877	$136,471.41	47483*	19801*
1878	$117,670.23	43285*	27281*
1879	$125,211.42	28927*	37277*
1880	$114,846.43	223,861	67,059
1881	$107,658.24	216,719	75,262
1882	$105,526.19	195,118	83,169

*totals only include sales in Subsistence Stores, not sold via returns