HISTORICAL ARCHAEOLOGY OF ALASKAN PLACER GOLD MINING SETTLEMENTS: EVALUATING PROCESS-PATTERN RELATIONSHIPS

A

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By

Robin Owen Mills, B.A., M.A.

Fairbanks, Alaska

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UMI Number: 9902602

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

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By

Robin Owen Mills

RECOMMENDED:

Lydia Black

Roger W. Pearson

Roger Powers

S. Craig Gerlach

Advisory Committee Chair

[signature]

Department Head

APPROVED:

[signature]

Dean, College of Liberal Arts

[signature]

Dean of the Graduate School

8-27-98

Date

ABSTRACT

The objective of this research is to explicate appropriate methods for investigating relationships between past historical processes and variables, and resulting contemporary patterns in archaeological and historical data sets. Turn-of-the-twentieth century placer gold mining in interior Alaska is used as a case study to evaluate these relationships. By linking observable patterns in historical data sets with the variables and processes that in part create and shape them, a more-complete, context-specific explanation of past events and actions emerges when the data are evaluated in specific historical settings.

The methodological approach used here is to first formulate explicit "expectations," and then to evaluate them against independent Alaskan historical and archaeological data sets. The expectations derive from independent comparative historical, geographical, and archaeological research.

One series of nine expectations evaluates attributes of artifacts relating to site and feature abandonment processes relating to curation and scavenging, including specific traits of artifacts in curated and scavenged deposits; the changing effects of continued curation and scavenging on an artifactual assemblage through time; and spatial characteristics of artifacts within curated and scavenged foundations. Four types of data are used evaluate the expectations, including the size of artifacts, whether they are still functional or usable, their spatial provenience within excavated structures, and a feature's data range. Seven of these expectations are corroborated, one is falsified, and one requires further data for a full evaluation.

A second series of seven expectations examines aspects of placer gold mining settlement and transportation systems, including the core-peripheral relationship between Alaska and the United States; the nature of expansion of gold mining settlements into new areas; locational, demographic, and physical layout characteristics of settlement systems; the mining settlement hierarchy and its changing components through time; and characteristics of the supporting transportation supply system. These expectations, while

also corroborated by the Alaskan data, lend themselves more to historical context-specific understanding and interpretation, as opposed to the strict corroboration-falsification dichotomy of the abandonment analyses.

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To my Wife. Mary Ann. without whose help this dissertation might never have been finished.

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The initial survey crew in 1994 at the Tofty town site consisted of myself and Howard Smith, Mary Ann Sweeney, Ron Standlee, and Norris T. Mills. The students in the 1994 archaeology field school at Coldfoot include Charles Drapeau, Zoe Schneider, Peter Godwin, Benton Taylor, C. Ryan Colby, Julie Maurer, Jerri Moore, Kim Ackerman, and Deanna Meyer. Special kudos to Jane Finnell who served as cook during the 1994

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Numerous miners and others who work and live in the Hot Springs and Koyukuk mining districts visited the 1994 and 1995 excavations, and provided numerous services, information, help, and much friendliness. Mining claimants Andy Miscovich and Jack Neubauer graciously allowed our presence on their claims in 1994 and 1995. Several other local miners and Wiseman locals visited us and allowed us to visit them on their claims, including Don and Flo Kenney, Bill and Claudine Nordeen, Mitch Fleming, Jack Reakoff and his son Jesse, and George Lounsbury. Mr. Lounsbury also spent many hours sharing his stories and abundant photographic and documentary collection of the Upper Koyukuk, not only in his cabin in Wiseman but also in his home near Fairbanks. Sandy Wilcox put us up on floor of the Department of Interior information center during the night of the 1994 Koyukuk flood. Jon Peterson, National Park Service Ranger stationed at Coldfoot, put us up for a couple of nights in NPS housing after the 1994 Koyukuk flood, and provided a Park Service truck to help in transporting supplies. Thanks to Grant Spearman, curator of the Simon Paneak Museum in Anaktuvuk Pass, Alaska, for visiting and lecturing to 1994 Coldfoot field school. Troy and Jan Thacker, then-present owners of Coldfoot Services, provided supplies and other services at cut-rate prices. And lastly, I am indebted to Mike Miscovich for evacuating the entire field school in the early morning hours of August 17, 1994 from the Coldfoot archaeological site during the Koyukuk flooding. His 12-wheeler army surplus flatbed truck was the only vehicle in the area that could successfully get through the flood waters that separated the Coldfoot town site from the "mainland."

Most of the basic cataloguing of the artifacts from the 1994 and 1995 archaeological field schools was done by the students in the field. Additional laboratory work and cataloguing was performed by C. Ryan Colby in 1994-95, Caroline Carter in 1996-97, and Meg Thornton, Blake Merrifield, Jillian Mesch, Josh Mesch, Aaron Robertson, and Josh Reuther in 1997. Dr. Vaughn Bryant and Dawn Marshall of Texas A & M University's Pollen Laboratory analyzed the privy samples taken from Coldfoot Feature 11 (presented as Appendix A). Tom O'Brien, Craig Gerlach, and John Cogdill spent hours helping to identify unknown artifacts, and Chuck Adkins identified all of the munitions-related items. Russell Gould was instrumental in helping to design and construct the Paradox data base used in artifact cataloguing and analysis, and Matt Ganley (my sandbox buddy) taught me the basics of using Autocad in addition to designing several of the Alaska base maps used herein. Matt also formulated graphically Figure 3.1 from my frenzied verbal descriptions. Russ Sackett provided architectural terminology clarification; Becky Saleeby provided unpublished National Park Service field files relating to mining sites surveys in the Upper Koyukuk and McCarthy areas; Anne Worthington provided unpublished National Park Service Autocad drawings of mining sites in south-central Alaska (i.e., Figure 5.53); Logan Hovis opened up his personal files relating to mining references for my use; Tracie Cogdill for coordination help during the 1994 and 1995 field schools, and for general encouragement and help over the years; and Mary Ann Sweeney scanned and drew in Corel Draw several of the figures used in Chapters 2 and 4, and independently researched the Innoko mining district and provided to me all of her data for inclusion here.

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CHAPTER 1
INTRODUCTION

OBJECTIVES

This dissertation is concerned with formulating appropriate methods aimed at linking past processes with observable patterns in archaeological and historical data sets. This concern is part of a larger goal of understanding past and present natural and cultural formation processes. The underlying objective of the study is to recognize, delineate, and understand the operation of such past processes and variables in particular historical settings, in order to examine the relationship between such processes and their effects upon material culture, both documentary and material. By linking observable patterns in historical data sets with the variables and processes that in part create and shape them, a more-complete, context-specific explanation of past events and actions emerges when the data are evaluated in specific historical settings. It is this pursuit of stronger interpretations or explanations of past historical contexts which is the fundamental objective of this dissertation.

What is meant by "processes" are events or sequences of events, whether internal or external to the system in question, that influence a particular course of action. Examples might include natural and ecological systems, economic or market forces, and social, and ideological movements. "Material culture" is here defined as artifacts, structures and other features, and even entire settlements and transportation systems.

HISTORICAL SETTING, TOPICS OF RESEARCH, AND SCALES OF ANALYSIS

Interior Alaskan placer gold mining at the turn-of-the-twentieth century will serve as a case study to examine these objectives (see Figure 1.1). Two broad topics of research or analysis are examined in this dissertation to assess the relationship between past

KEY:

Close-Up Boxes Illustrated in the Dissertation ☐

Innoko Mining District — A

Iditarod Mining District — B

Koyukuk Mining District — C

Hot Springs Mining District — D

Fairbanks Mining District — E

1 Kuskokwim R.
2 Yukon R.
3 Koyukuk R.
4 Innoko R.
5 Iditarod R.
6 Tanana R.

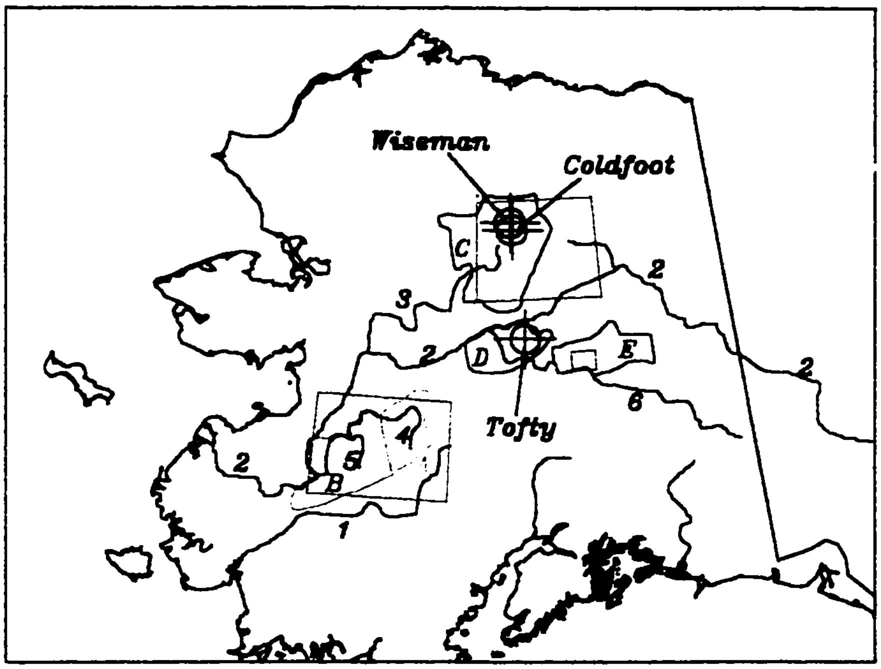


Figure 1.1 Excavated settlements, and mining districts examined in the dissertation.

processes and variables and their subsequent effects upon the historical and archaeological records. First, I will focus on feature and site abandonment. Specifically, the relationship between known conditions of abandonment at Alaskan mining settlements, and residual patterns seen in artifactual attributes and spatial arrangements are examined. The second topic of research in this dissertation focuses on the interplay between how past processes and variables affect aspects of placer gold mining settlement systems and transportation systems. The locations of settlements on the Alaskan landscape, their general layout patterns, and their functions are all related to the roles they played within a larger extractive economy linking Alaska to the United States and the rest of the world. These and other aspects of settlement and transportation systems are examined below.

This dissertation recognizes that past processes and variables which affect patterning in material residue operate at a variety of temporal and spatial scales. This material residue (e.g., artifacts, features, settlements) itself was deposited at a variety of spatial scales on the Alaskan landscape. Such scales range from very large (e.g., global; centuries) to very small (e.g., one structure; one moment). With this understanding in mind, this dissertation intentionally focuses upon a variety of spatial scales of analysis. In regards to the abandonment focus of the research, three Alaskan mining sites founded at or just after the turn-of-the-twentieth century are examined, specifically Coldfoot and Wiseman in the Koyukuk mining district in north-central Alaska, and Tofty in the Hot Springs mining district in central interior Alaska (see Figure 1.1). Archaeological excavations conducted at these three town sites in 1994 and 1995 provide the artifactual and architectural data bases necessary to examine abandonment process-pattern relationships. Temporal, architectural, artifactual, and historical data dealing with the history of these three settlements and their archaeological excavations are presented in Chapter 2 and Appendices A through F. These data provide rare archaeological and architectural detail from interior Alaska gold mining settlements. The purpose of presenting these data in detail is to provide artifactual and architectural data sets for comparative purposes, so that other researchers might use them to develop generalizations to aid in historical explanation, both inside and outside of Alaska.

In the examination of placer mining settlement and transportation systems, a variety of spatial scales are used, initiating with Alaska, and then shifting down to individual mining districts, and ultimately to the site or settlement level. Four Alaskan mining districts are chosen to use as case study examples when assessing interests at the district level: the Koyukuk mining district in north-central interior Alaska, the Fairbanks mining district in central interior Alaska, and the adjacent Innoko and Iditarod mining districts in west-central interior Alaska (see Figure 1.1). All major settlements within these districts dating to the early twentieth century (ca. 1900-1920) are examined.

ASSUMPTIONS

In sum, three basic assumptions regarding past processes and resulting material patterns underlie this study: (1) as above, numerous processes and variables occurring at a variety of spatial and temporal scales affect and condition the decisions that people make on a daily basis at their places of work and habitation; (2) meaningful comparisons can be made among seemingly disparate times and places owing to a similarity in shared variables and processes affecting those different settings; and (3) although comparisons between different historical settings may illuminate shared similarities of variables and processes, each particular historical setting is its own unique combination, or conjunction, of historical variables, processes, peoples, and events.

These assumptions and the methods used to assess the nature of process-pattern relationships in placer gold mining settlement systems and abandonment are inextricably linked. The methods used are predicated in part upon basic assumptions in this dissertation regarding the relationships between processes and variables operating in the past, human decision made in the past at the local level, and material goods. Figure 1.2 models these relationships, illustrating that different processes and variables which

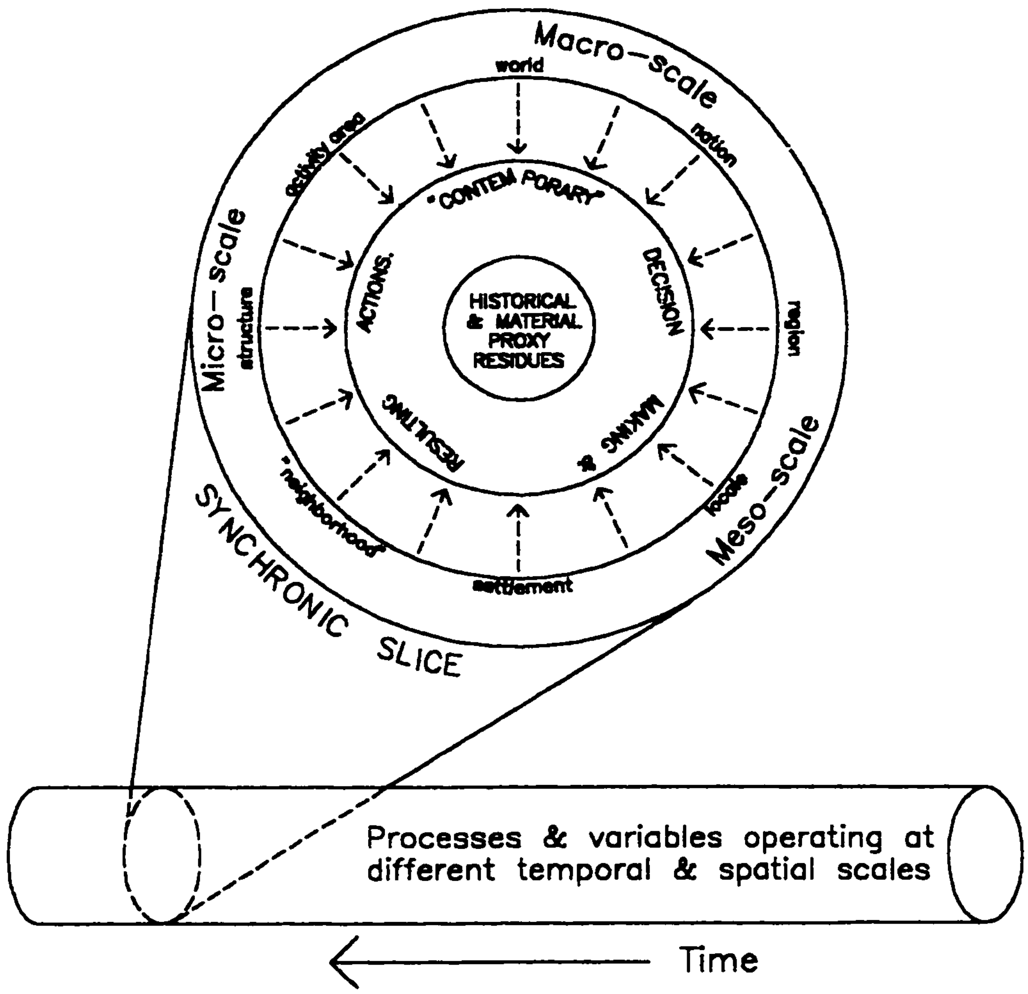


Figure 1.2 Different processes & variables operating at different temporal & spatial scales influence contemporary decision making, & resulting actions.

operate at different temporal and spatial scales all affect human decision making. Such processes include, but certainly are not limited to, the environment and ecology, economics, technology, sociocultural aspects, and religious and ideological aspects. By example, both World Wars were large-scale processes that occurred within a (relatively) short time scale, yet colonialism, imperialism, and/or aspects of capitalism, and other large scale global processes have been operating for over five centuries (e.g., Arrighi 1994; Orser 1996; Wallerstein 1974, 1980, 1989). On the other hand, creek or drainage-specific availability of building material, fuel, game, and water may all operate simultaneously or in some combination at seasonal, annual, or decadal time scales. Human decision making in any particular historical setting (indicated by the synchronous "slice" in Figure 1.2), therefore, potentially draws from processes and variables operating at widespread to local spatial scales, and short-term to long-term temporal scales.

That certain historical processes and variables operate at larger scales of analysis, whether spatially, temporally, or both, means that events and actions which occur in different historical settings are comparable. For instance, all peoples affected by British colonialism, from South Africa to Australia to Hudson's Bay, had at least this one process in common, and had to make separate decisions in their lives involving this shared variable. Likewise, all peoples who mine placer gold need to solve common extractive, transportation, and supply problems required by this specific type of economy. However, the specific combination, or "conjunction" (c.f., Gibbon 1989:164-165) of processes, variables, events, cultures, and even individual people in any particular historical setting ensures its uniqueness relative to other settings. What is being advocated here is not a neo-deterministic approach to historical explanation, but simply a recognition that similar processes or variables may elicit similar responses by peoples in different times and places.

METHODS & DISSERTATION OUTLINE

The methods utilized in the following chapters are directly influenced by the three primary assumptions discussed above. Both process-pattern analyses in this study (i.e., abandonment analysis; placer gold mining settlement systems analysis) undergo the same basic methodological approach. First, generalized "expectations" are derived principally through either (1) comparative studies or (2) historical or ethnographic research. Thus, both the historical settlement system expectations and the archaeological abandonment expectations derive from research conducted in times and places exhibiting similar processes and variables as those exhibited by the Alaskan placer gold mining setting at the turn-of-the-twentieth century. The second step in this analysis involves evaluating both sets of expectations relative to Alaskan data sets derived from the turn-of-the-twentieth century.

In Chapter 3, archaeological abandonment expectations are derived from research conducted at settings with known abandonment conditions, whether historically or ethnographically derived. Efforts were made to find studies outside of Alaska with abandonment processes and variables similar to those exhibited by Alaska placer gold mining at the turn-of-the-century, that is, <u>those exhibiting high degrees of both curation and scavenging</u>. In all, nine expectations relating to abandonment at Coldfoot, Tofty, and Wiseman are formulated and evaluated in Chapter 3, relating to specific artifact condition attributes, changing condition attributes through time, and artifact spatial analyses. Succinctly, these nine expectations are: (1) curated and scavenged artifactual assemblages will be dominated by non-functional, non-usable refuse, (2) usable, *de facto* refuse that <u>is</u> present in an assemblage will be dominated by small items, (3) the relative amount of functionally usable refuse in a feature's assemblage will be higher in later-abandoned features relative to earlier-abandoned features, (4) "hoarding" will be evident in later-abandoned features, (5) the longer a structure is either wholly or partially standing, the lower the relative amount of usable items will be found in its assemblage, (6) subterranean storage units will have relatively more refuse found in them than anticipated by their size, (7) refuse found on intact floors of gradually-abandoned structures will form discrete clusters, (8) refuse inside structures which have had their wooden floors scavenged will tend to congregate alongside walls and away from centrally-located areas, and (9) relatively more refuse will be found on remnant floor boards sections in floor-scavenged structures than in areas where the floor boards have been removed, especially if located alongside walls.

Specific, quantifiable methods are derived herein to evaluate each of these nine expectations. These methods, discussed in detail in Chapter 3, are based upon one or more of four simple sets of data: the percentage of "usable" or functional refuse (i.e., *de facto* refuse) in an assemblage, the size of an artifact, the spatial provenience of an artifact, and the date of an excavated feature based upon its artifactual content. Thus, the relative percentage of usable items in a feature's assemblage is all that is necessary to evaluate expectation #1, usability and size of individual artifacts are needed to evaluate expectation #2, usability and a feature's date range are needed to evaluate expectation #3 and #4, usability and historical and/or architectural information pertaining to excavated structural remains are needed to evaluate expectation #5, and only spatial provenience data are needed to evaluate expectations #6-9.

Seven of these nine abandonment expectations are corroborated by the analyses presented in Chapter 3, below, with expectations #6 and #7 being the only exceptions. Expectation #7 could not adequately be evaluated owing to the availability of only a single feature which met its basic precondition; that is, there was only one excavated structure that had an intact floor on which to examine refuse distribution. More data is therefore needed to fully assess this expectation. Expectation #6 was largely falsified by the available data; that is, three of the four subterranean storage units found in four separate excavated foundations did not contain larger than expected amounts of refuse in them. In fact, they contained less than expected amounts. Having delineated this discrepancy between the "expected" and the "actual," an explanation is forwarded based upon context-specific size variables of the storage units in question.

Similarly, in Chapter 4 seven expectations of an early placer gold mining settlement and transportation systems are formulated using independent comparative historical studies relating to either (1) population migrations into new geographic areas, that is, "frontier" research, or else (2) comparative research which specifically addressed various transportation, social, geomorphological, and technological aspects of mining in late-nineteenth century North America. The seven expectations formulated in Chapter 4 are then each evaluated in Chapter 5. As above, the attempt is to evaluate and link specific historical processes operating in the past with contemporary patterns in data, this time largely documentary. These seven expectations of an early placer gold mining settlement and transportation system in Alaska are:

(1) Extractive economy: Alaska is expected to conform to characteristics of an extractive economy, including a close and extensive core-periphery relationship with a "homeland" (i.e., the United States) reflected in terms of economics, social, and political variables;

(2) Settlement fluctuations: short-term fluctuations in the founding, occupation, and abandonment of settlements and regions is expected, with accompanying rapid fluctuations in transportation requirements when and where needed;

(3) Settlement hierarchy: a settlement hierarchy of up to five "tiers" is expected in any particular mining district, including an Entrepot (required), Intermediate Transfer and/or Supply Points, a Central Distribution Center (required), Secondary Distribution Points, and Extraction Camps;

(4) Changes in settlement hierarchy: relatively rapid shifting of the economic, political, and social functions of individual settlements will occur across time and space, both within and between mining districts. Also, the types and quantities of services typical of a Central Distribution Center (e.g., wholesalers; professional services) will "shift downward" into associated Secondary Distribution Points when prompted by population pressure;

(5) Development and internal dynamics of Central and Secondary Distribution settlements, and Extraction Camps: placer gold mining distribution towns will develop rapidly in terms of population, commercial services, tradesmen, local governments, and social institutions. Also, specialized retail outlets, businesses specialized in servicing a highly mobile population, and increased numbers of unions, lodges, and halls are expected in this settlement system. The physical layout of Central Distribution Centers will conform to a "gridiron" arrangement, a Secondary Distribution Point's layout will be either linear or a less-developed grid, whereas an Extraction Camp will be clustered;

(6) Resource-based settlement and transportation system: the production and processing technology, the bulk of the population, and most of the settlements will be located specifically at patches of extractable resources. This will likely result in a non-dendritic settlement and transportation pattern, which expands rapidly, results in highly urbanized areas in otherwise lightly populated regions, and is connected by lengthy often tenuous supply lines; and

(7) Transportation services: two types of transportation services are likely to occur, (a) Intermediate Transfer Points or settlements will be located at changes in the modes of transportation along the supply routes, and (b) Intermediate Supply Points which service the means of transportation, its employees, and/or passengers. Intermediate Transfer settlements may be either linear or converging in layout, depending upon the means of transportation, and Intermediate Supply Points will form clusters next to the transportation route.

By and large, these seven expectations are corroborated by the turn-of-the-twentieth century Alaskan placer gold mining data. Primary and secondary historical data sets examined in this regard included historical photographs, U.S. Census records, U.S. Bureau of Statistics records, federal mining reports, Alaska Road Commission reports, published biographies and autobiographies, archived Episcopal Church of Alaska records, archived Bureau of Land Management records, Ph.D dissertations and Masters theses, oral history, and various directories, hotel registers, newspapers, and magazines.

The final Chapter 6 summarizes again the objectives, assumptions, and general conclusions of the dissertation, in light of the data in the preceding chapters.

CHAPTER 2

ARCHAEOLOGICAL INVESTIGATIONS AT THREE INTERIOR ALASKAN GOLD RUSH MINING SETTLEMENTS

This chapter proves baseline archaeological data for comparative use by archaeologists, historians, and architectural historians elsewhere. Quantified, observation-based data form the building blocks upon which comparisons, generalizations, and contrasts between sites and regions through time are possible. This chapter and accompanying Appendices A to F provide architectural and artifactual data associated with excavations conducted in 1994 and 1995 at three interior Alaskan mining settlements founded at the turn of the twentieth century: Coldfoot and Wiseman in the upper Koyukuk drainage in north-central Alaska, and Tofty in central Alaska (Figure 1.1). Prior to this study, only one other systematic archaeological excavation had been conducted in an interior Alaskan mining settlement, dating to any time period. This excavation, conducted in downtown Fairbanks, Alaska in 1992 and 1993 (Bowers and Gannon 1997), provides a wealth of information comparable to the Coldfoot, Wiseman, and Tofty data sets, such as age, general setting, and material goods , but incomparable in others, such as architecturally. Likewise, archaeological investigations conducted at Skagway in southeastern Alaska, a vital coastal transportation and supply point for Alaskan and Yukon miners are comparable again in terms of time and artifacts, but incomparable in other ways, such as differences in settlement function (e.g., Blee 1983, 1988, 1991; DePuydt et al 1997; Rhodes 1988). In this chapter and associated appendices I hope to contribute a comparable data set from interior Alaskan mining settlements, a functional and temporal setting which has been largely ignored by the archaeological community.

Basic information necessary for comparative purposes by other researchers are provided below, including sections on (1) *Historical Outlines* for the three communities, and the (2) *History of Archaeological Research* conducted at each of the three sites, which involves a discussion of techniques and methods used by the researchers. Next, estimated age ranges are provided for each of the excavated features by examining artifactual attributes in (3) *Archaeological Feature Chronology*. Having provided this basic background data, subsequent (4) *Architectural Detail* discussions are supplied for each excavated structural foundation, which are each discussed in detail in Appendix B. In addition to structural foundations, other types of features were excavated, including trash pits, a privy hole, and an unidentified feature beneath the Tofty Feature 1 foundation. These other excavated features are presented in detail in Appendix C, and the results of analysis of samples taken from the privy hole are presented in Appendix A. A final section, *Local Manufacture and Re-Use* of raw materials, briefly examines the nature and manner of material goods re-use prevalent in many historic Alaskan mining sites. While noted in other reports (e.g., Sattler et al. 1994), the section presented here attempts to define categories and a manner of quantification in which to address this prevailing practice at mining sites, but for which little systematic analysis has thus far been performed.

A full description and discussion of the more than 18,700 artifacts recovered during the Coldfoot, Tofty, and Wiseman excavations is beyond the scope of the present study, and will require a separate monograph-length presentation (Mills and Sweeney 1998, in preparation). Because of the near-complete lack of comparable data available from turn-of-the-century gold rush mining settlements in Alaska, additional appendices are provided at the end of this study. The goal of all of the following appendices is to disseminate as much data and detail as possible for use by other researchers. Appendix D (*"Sprague" Classification System Used in this Study*) is an outline of the classification system used to catalogue all of the artifacts, Appendix E (*Coldfoot, Tofty, and Wiseman Artifact Inventory*) is a complete outline of all artifacts recovered by classification code and by excavated feature, and Appendix F (*Manufacturers, Brand Names, and Distributors from Coldfoot, Tofty, and Wiseman*) is a listing of known "origin" data provided by the assemblage, listed by function code per feature, and the names of the manufacturer and their geographic location, if known.

HISTORICAL OUTLINES

Coldfoot and Wiseman, Upper Koyukuk Drainage

Prospecting and small scale mining of small quantities of gold were being mined from bars and benches at points along the lower and middle stretches of the Koyukuk River as far north as Tramway Bar as early as the 1880s and 1890s (see Chapter 5, Figures 5.54-5.56; Schrader 1900; Maddren 1913). Small trading posts had been constructed sequentially along the middle Koyukuk at "Arctic City" in 1893, "Bergman" in 1898, "Peavy" in late 1898, and "Bettles" in summer 1899 at the head of small steamer navigation on the Koyukuk (Bettles 1995; Schrader 1899, 1900). Large numbers of Euroamericans entered the Koyukuk drainage during the summer of 1898, mostly via small steamers, as a result of overflow from the Klondike area in the Yukon Territory. Dozens of water craft ascended the Koyukuk, and many of these along with several small steamers were frozen for the winter of 1898-99 at various places along the Middle and South Forks of the Koyukuk, and on the Alatna River. As a result, a variety of new settlements were founded near the steamers ("Soo City", "Union City", "Beaver City", "Seaforth", "Jimtown") or else people coalesced around the existing settlements at Bergman, Peavey, and just upstream from Arctic City (flooded out in 1896) at "New" Arctic City (Bettles 1995; Schrader 1900; Wonson 1899; Wyman 1988). As many as 1200-1500 people entered the Koyukuk drainage via the Koyukuk River and by a variety of land routes during this first stampede (see Chapter 5, Figure 5.55), with as many as 500-600 spending the winter (Schrader 1900). Most of these would immediately leave after spring break up in 1899. At this same time, however, in March 1899, the first payable quantities of gold were discovered along Myrtle Creek, a tributary of Slate Creek, this latter a tributary of the Middle Fork of the Koyukuk located about 70 miles above

Bettles. This prompted a second rush to the Upper Koyukuk during the summer and winter of 1899 as word finally reached outside.

It was the result of this second stampede in 1899 that a fledging tent city immediately sprung up at the mouth of Slate Creek, at its confluence with the Middle Fork of the Koyukuk (Hegg 1902:10; Yukon Archives n.d.; photos date to either summer 1899 or summer 1900). Although originally called "Slate Creek," the name quickly changed to "Coldfoot." Coldfoot is located about 80 kilometers above the Arctic Circle in north-central Alaska, and is situated within the south-facing slope of the Brooks Range. The rush would continue through the fall and into the winter, as prospectors, miners, and others descended upon the Upper Koyukuk from a variety of directions. In 1901, a town site plat map for Coldfoot was recorded with the Koyukuk District Recorder (see Chapter 5, Figure 5.79). Coldfoot enjoyed its peak between 1902-04, prior to the exhaustion of the rich, shallow placer grounds in surrounding streams and creeks. During its heyday, the town contained minimally a post office, two stores (including a Northern Commercial Co. merchandise store), a gambling establishment, two roadhouses, seven saloons, a number of brothels, two lawyers, a doctor, and was the seat of the Koyukuk Mining District's U.S. Commissioner (which often consolidated the powers of Justice of the Peace, U.S. Land Recorder, Probate Judge, and coroner in smaller districts) and Deputy U.S. Marshall (with accompanying jail). A trail survey team in 1904, working for the Alaskan Board of Road Commissioners, reported about 80 structures in the town.

During these first few years, placer gold was discovered in varying quantities on numerous streams and tributaries surrounding Coldfoot in the Upper Koyukuk. A system of summer pack trails and winter dog sled trails developed to link these outlying grounds to Coldfoot. Wright's Roadhouse was built along one of these trails, at the mouth of Wiseman Creek on the Middle Fork of the Koyukuk, located about 12 miles further upstream from Coldfoot. Falling gold production in the Coldfoot area, and newer strikes further upstream especially the rich strike on Nolan Creek in 1907 (a tributary of Wiseman Creek), induced most of the commercial establishments and U.S. Federal representatives and posts (Commissioner; U.S. Marshal; post office) to progressively relocate between 1907 and 1912 to a new town that sprung up around Wright's Roadhouse. The settlement, originally called "Wright's", "Wright's City", and then "Nolan," eventually became known by its contemporary name, Wiseman. A traveler through Coldfoot in 1906 noted that it was "much decayed," and by 1914 was "dead" (Stuck 1916:47). The town might not have been as "decayed" as appearances made out, for the Chandalar district strike (to the east) and stampede occurred in 1906, drawing away most miners (at least temporarily) to this area. The 1910 U.S. census indicates only 24 people in the town, including 16 whites (13 adult males, 2 women, 1 child) and 7 natives and mixed native-whites (2 women, 5 children). Stuck notes that the central focus of operations in the Upper Koyukuk "shifted" from Coldfoot to Wiseman, implying a drawn-out affair and not a sudden catastrophic abandonment.

Whereas most of the population became situated in and around Wiseman, at least one family continued to live at Coldfoot post-1912. In 1914 a Japanese man named Minano and his native wife and children moved to Coldfoot, and would live there until ca.1927 (Warbelow 1993). Edith Smith, one of Minano's daughters who lived first in Coldfoot and later in and around Wiseman, does not mention any other families living in Coldfoot during the time her family lived there (Warbelow 1993). This may have just been an oversight. though. On the other hand, the Minano family were reported to be the only people living in Coldfoot in 1924 and 1925 by different travelers passing through en route to Wiseman (Drane n.d.; Murie 1978). The only mention of other occupied cabins in Smith's book during her family's tenure at Coldfoot is a reference to an operating roadhouse in 1919. This same roadhouse and its adjoining store are referenced as operating two years earlier in 1917 in Turak Newman's book "One Man's Trail" (Newman 1978), with the proprietors being a white man named Jim Sibley and his Kobuk Eskimo wife Kitty. Sibley apparently moved to the Wiseman area sometime between 1919 and 1920, as he is listed in the U.S. 1920 census in this locale.

In 1918, Alaska's governor re-acted positively to the creation of a Wiseman School

District, which resulted in the appropriation of money for the construction of a school house and to the enlistment of a teacher. A school was built in Coldfoot in time for the beginning of the fall 1919 term, as Coldfoot during that time "was more centrally located for school children than was Wiseman," apparently because of the Minano children (Brown 1988:341-42; Bartlett n.d.: Photo #72-156-237). School records indicate that only the Minano children were from Coldfoot, the rest being from Wiseman families (Brown 1988:342). The Coldfoot school operated until in closed 1923, with several years delay until it opened again in Wiseman in fall 1927. The Coldfoot school house was relocated to Wiseman in the spring of 1928, where it is still stands today, presently functioning as a domestic habitation (Brown 1988:341-42, 498-99; personal observation, 1995).

None of the excavated structures or other Coldfoot features have datable artifacts beyond 1930 (see Archaeological Feature Chronology, below). The nature and extent of habitation at Coldfoot between ca. 1927 (when the last Minano family members moved away) and the early 1950s, when the next confirmed inhabitants are known to have occupied Coldfoot, is presently unknown. Oral data indicate that by the early 1950s at least one native couple, Sammy and Ludie Hope, and one white miner, Jim Murphy, re-occupied Coldfoot, with the exact date of their arrivals presently being uncertain (George Lounsbury, personal communication 1996; Thompson 1974:12, in Will 1981:12). The dating of this last, 1950s-era occupation is indicated not only by the oral data, but is corroborated by datable refuse presently surrounding the last two (partially) standing habitation structures in Coldfoot. No one has lived at Coldfoot since the Hope family moved away in the mid-1950s.

Wiseman continues to be a viable, albeit small, community to the present day. Its population declined gradually during the 1930s, and dramatically during the early 1940s as a result of the federally-mandated war order that ceased most U.S. gold production, in 1942. This drew away most of the area's population. The school officially closed in 1941, never to re-open in an official capacity. The town's population dipped to as low as five people in the 1940s and 1950s, while the entire surrounding area only had 21 people by 1952 (George Lounsbury, personal communication 1995; Brown 1988:392). Today, about 29-30 people live in Wiseman. Although it continues in some respects as the social center of the Upper Koyukuk, it was supplanted as its economic center shortly after the contemporary truck stop and U.S. Post Office was built at Coldfoot Services in the early 1980s. Coldfoot Services is situated immediately off and east of Dalton Highway/Haul Road, about one mile from the old town site.

Transportation into the Upper Koyukuk

Transportation is essential to understanding material goods availability in the Upper Koyukuk drainage. An examination of explorers' accounts and early geological survey reports at the turn of the century, the annual reports of the Alaska Road Commission which was founded in 1904, and personal narratives of travelers who visited the Upper Koyukuk, all provide detailed information on the extent of then-current transportation practices.

Several existing river and trail routes from all directions were used to gain access to the gold-bearing region in the Upper Koyukuk. The most popular, however, was up the Koyukuk River by small steamer or other small water craft in the summer, which served as the principal route for material goods into the country. Several overland routes were also used, and the ones most-mentioned in the early documentary sources include: the route up the Chandalar River from Fort Yukon, which eventually crossed the divide between the Chandalar and Koyukuk drainages, and then down Slate Creek to Coldfoot; and the Dall River route from the Yukon River which eventually wound its way to the Middle Fork of the Koyukuk and on to Coldfoot; and the trail between Tanana and Fort Gibbon at the junction of the Tanana and Yukon Rivers, overland by trail to New Arctic City on the Koyukuk River, via the Tozitna and lower Kanuti rivers (see Chapter 5, Figures 5.56-5.58). The exact founding of this latter route is presently unknown, although

Schrader (1900:456) mentions a Tozitna River route used by the early 1898-99 stampeders. These overland trails never became more than summer pack trails and winter dog sled trails. The Chandalar route was favored for mail delivery into Coldfoot (Post Office established in 1902) until 1906, when the Tozitna drainage route took over this duty (Maddren 1913). At this point, the Alaska Road Commission assumed maintenance responsibilities for this latter route, upgrading it to summer pack/winter dog sled trail by the winter of 1909-10 (Alaska Road Commission 1907-1911; Ricks 1965). By 1909, Maddren (1913) reports that the Dall River route was overgrown and little used.

The means of getting most goods into the Upper Koyukuk developed early and remained essentially unchanged until 1929. Goods were first transferred from ocean-going craft to large steamers at St. Michael, located in southern Norton Bay, near the mouth of the Yukon River. Goods were then unloaded at either Nulato (ca. 20 miles down river on the Yukon from the mouth of the Koyukuk River), or Koyukuk Station (ca. 6 miles down river from the mouth of the Koyukuk), or at Fairbanks (up the Tanana River, in central-interior Alaska) from large Yukon River steamers. Supplies were then loaded onto smaller steamers that had shallower drafts, which could ascend the Koyukuk (hopefully) to as far as Bettles, the head of high-water navigation on the Koyukuk River. Here, the Northern Commercial Co. had built a store and warehouse, which stored goods while awaiting transfer further upstream. The summer means of transfer further upstream to Coldfoot/Wiseman was costly, and occurred by one of two principal mean: horse-drawn scows, which could transfer ca. 8-12 tons (Maddren 1913:30) of supplies the additional ca.70-80 miles to Coldfoot/Wiseman (Maddren 1913:Plate VIIIA; Marshall 1991:127, indicated 15-20 tons by scow), or by human-powered poling boats (Driscoll n.d.: Photo #64-29-217; Northern Navigation Co. 1912:10). If winter transport was required, dog sleds were used. Only in 1917 did the Alaska Road Commission finally upgrade this Bettles-Coldfoot route to a winter sled trail capable of supporting horse-drawn double-ender sleds (Alaska Road Commission 1917-19).

For the first half of this century, in terms of distance and freighting costs the Koyukuk district was regarded as the most isolated mining district to work in Alaska,. In 1904, Judge James Wickersham, in a plea to the U.S. Congress for federal relief in helping to build a road system in Alaska, reported that the cost of shipping goods from Seattle to Bettles (the upper limit of steamer navigation on the Koyukuk) cost $135 a ton. It would cost an additional $200 a ton to get the supplies from Bettles up to the diggings at Coldfoot, only 50-odd miles further upstream. Two factors prevented any route more tangible than a dog sled trail being built into the Coldfoot-Wiseman area prior to 1974: lack of appreciable quantities of gold, and the exorbitant cost required to build such a route over such a long distance. Thus, until 1974 when the Trans-Alaska Pipeline's "Haul Road" (now Dalton highway) was built past Coldfoot and Wiseman en route to Prudhoe Bay, no wagon trails, seasonal or otherwise, ever made it into the Upper Koyukuk from the outside. Even in 1925, one ton of goods cost only $40 to get from Seattle to Nenana by steamships and the Alaska Railroad (completed Seward-Fairbanks in 1923), an additional $80 from Nenana to Bettles by small steamers, and then $140 more from Bettles to Wiseman. This last ca. 80-odd mile stretch cost 15% more than the prior combined 3500 miles!

Meanwhile, the other main route into the Upper Koyukuk, via the Chandalar drainage to the east, underwent improvements and additions following the discovery of gold in the area in 1906. The head of navigation on the Chandalar River prompted a short-lived settlement named "Chandlar" which supplied the new settlement of Caro, ca. 40 miles further upstream (see Chapter 5, Figures 5.59-5.60; Brooks 1906-1908). Caro was still ca. 35 miles from the main gold diggings, thus the Alaska Road Commission began construction of a trail between Beaver, on the Yukon River, and Caro during the winter of 1909-10 in an effort to cheapen overall freight rates into the area and stimulate development (Alaska Road Commission 1910-11). By 1912, this route had been upgraded to winter sled route status along its entire route, and a summer pack/winter dog sled trail from Beaver south to Chatanika (north of Fairbanks, and the terminus of the Tanana Valley Railroad connecting Fairbanks-Chatanika) was under construction (see

Chapter 5, Figure 5.61; Alaska Road Commission 1910-1913). The Alaska Road Commission further by 1924 took over maintenance requirements of the popular trail connecting the Chandalar and Koyukuk drainages, had upgraded the Beaver-Caro sled route to all-season wagon road, and had erected tramways across the Chandalar river Caro, across Slate Creek on the Caro-Coldfoot trail, and across Slate Creek at Coldfoot and at two further places between Coldfoot and Wiseman (Alaska Road Commission 1923-25).

Subsequent to these developments, the first airplane landed in the Upper Koyukuk in 1925, landing on natural gravel bars at Wiseman and Bettles. Wiseman built its first airstrip the following year in 1926 (Alaska Road Commission 1926-27), and by 1929 three more strips had been built in the area, one in the Chandalar country to the east, one at the Betties River mining operations northeast of Wiseman, and one at Bettles (Alaska Road Commission 1927-1930). Although the airplane took over the mail contract and would eventually lead to the demise of the dog sled trail system in the 1930s, they were not at first economical enough for large-scale transfer of supplies. Most material goods still had to be brought up the Koyukuk to Bettles via small steamers and transported up the river primarily by horse-drawn scows. This changed, however, in 1929 when the first small Caterpillar tractor was brought to Wiseman. This machine very quickly supplanted horse-drawn transportation and hauling in the areas surrounding Wiseman, taking over not only the freighting of supplies between Bettles and Wiseman, both summer and winter. In addition, it supplanted other dog, horse and manpower means of transport and heavy labor. The introduction of this one tractor replaced the local teamsters, dog-sled freighters, wood haulers, and various mine laborers (Brown 1988:389-390).

The last major transportation innovation in the Upper Koyukuk occurred in 1974 when the "Haul Road," or Dalton's Highway, was constructed between the Yukon River and Prudhoe Bay. This gravel road was built prior to the construction of the Trans-Alaska Pipeline, which it accompanies for much of the route between Fairbanks and the oil fields at Prudhoe. When finally opened to public transportation following completion of the oil pipeline, the Haul Road finally ended the Upper Koyukuk's isolation.

Tofty, Central-Interior Alaska

Tofty, the other town site investigated archaeologically in 1994 and 1995, is located in the Manley Mining District in central Alaska, northwest of Fairbanks. While less research is available for Tofty, similar processes typical of other mining towns like Coldfoot also occurred at Tofty, such as its explosive "boom" founding and development, and its protracted steady decline and abandonment. In 1907, Tofty grew up on Discovery claim along Sullivan Creek (L'Ecuyer 1997:73). Originally called "Sullivan City," Tofty is typical of many other U.S., Yukon, and Alaskan placer gold mining towns: a quick peak in terms of population and business enterprise with the exploitation of shallow rich placers, and then a slow steady decline punctuated by increased bursts of activity with the arrival of either newer discoveries, or newer technology capable of profitably exploiting existing ground. The post office at Tofty, which opened in late December 1908 and served the surrounding countryside, finally closed in 1943 when mail was directed towards Manley, Tofty's principal supply town (Ricks 1965). Gold production for the surrounding district declined dramatically in the early 1920s (Brooks 1922-1925; Moffitt 1927; Smith 1926), and it is more than likely that Tofty declined with this downward trend. The 1924 annual report for the Alaska Road Commission reports the wagon road leading to Sullivan Creek was still in passable condition, terminating at the "placer workings in Sullivan Creek and the vicinity of the <u>old camp of Tofty</u>" (emphasis added).

There are two distinct points of contrast between Tofty and Coldfoot-Wiseman. First, Tofty maintained a link to outside goods and services that the Upper Koyukuk never had: an all-season wagon road which was built in 1910, only three years after the town was founded (Alaska Road Commission 1911). This roughly nine mile wagon road directly linked Tofty to (now) Manley Hot Springs, its major supply town, which in turn received supplies directly from steamers plying the Tanana River. The second contrast between Tofty and Coldfoot-Wiseman is that, long after its abandonment, what remained of the Tofty town site burnt down in 1969 when a forest fire swept through the area (Neubauer 1995, personal communication). Neither Coldfoot nor Wiseman ever burnt down. Evidence for the fire was abundantly evident during excavation of one of the foundations (Feature 1, or "Tofty 1"), including many burnt structural elements, abundant charcoal in the matrix, a section of charred floor boards, and melted bottle and window glass. Regarding the Tofty 1 foundation excavation, a local miner who has lived in the area since 1964 identified the foundation as "Tofty's old post office," deriving from his observations of mail strewn about the floor of the foundation (Neubauer 1995, personal communication). However, the "post office" interpretation has not been independently corroborated. This miner confirmed that Tofty 1 was indeed still partially standing just before the 1969 fire, although he could not remember if it was completely intact or had been partially scavenged for wood. Another miner, in the area since before the 1969 fire, told one of the 1995 UAF field school students that he had indeed scavenged some of the structural elements not only from Tofty prior to the fire, but specifically from the Tofty 1 foundation, the purpose being to re-use the wood elsewhere for another structure (Ross personal communication, 1995). The extent of this scavenging was not remembered or documented.

HISTORY OF ARCHAEOLOGICAL RESEARCH AT COLDFOOT, WISEMAN, AND TOFTY

Coldfoot (WIS-007)

The Bureau of Land Management (BLM) was initially responsible for maintenance of the Utility Corridor, a strip of land established in 1974 by the United States Congress for the transportation of energy sources between Washington Creek north of Fairbanks and Prudhoe Bay on the Beaufort Sea. The abandoned gold rush settlement of Coldfoot, Alaska, at the mouth of Slate Creek on the Middle fork of the Koyukuk River in north-central Alaska, is located in and near the boundaries of this corridor. In the spring of 1974, a construction camp, an air strip, and an access road were built by the Alyeska Pipeline Service Company prior to beginning the construction of the Trans-Alaskan Pipeline and associated Haul Road beginning that began that winter (Figure 2.1). According to a local resident who occupied the area prior to these construction episodes, several structural foundation remains from the old town site were destroyed when Alyeska built these facilities. The first archaeologist (employed by Alyeska under contract to the University of Alaska) visited the Coldfoot town site that summer (1974) after construction of the construction camp and air strip. No systematic survey or excavation of the town site was initiated at that time, the sole purpose being to watch for further impact to all cultural resources by Alyeska (Will 1981:1 and 13-14, and Susan Will 1998 personal communication).

Upon completion of the pipeline, the Haul Road was turned over to the state of Alaska, but management of the adjoining right-of-way was retained by the BLM. In 1979, the BLM initiated a plan for providing various public services along the Haul Road owing to a recent State decision to open that route to public access north of the Yukon River. As part of this planning, the BLM began to inventory cultural resources within the corridor, which included the Coldfoot town site (Will 1981:13). This site was visited and systematically surveyed by BLM archaeologists between July 28 and August 13, 1980. Eleven structures and foundations, and twelve additional cultural features (e.g., pits, trash dumps, linear clearings, ditches) were identified and roughly mapped by compass and meter tapes. No excavations were conducted at this time, but artifacts from an eroding trash dump feature were collected. The results of this survey, brief artifactual analysis, and accompanying historical research were presented in 1981 (Will 1981).

The site was next visited by BLM archaeologists in 1989, who spent only a few days on site. During this time, one trash dump feature was thoroughly inventoried

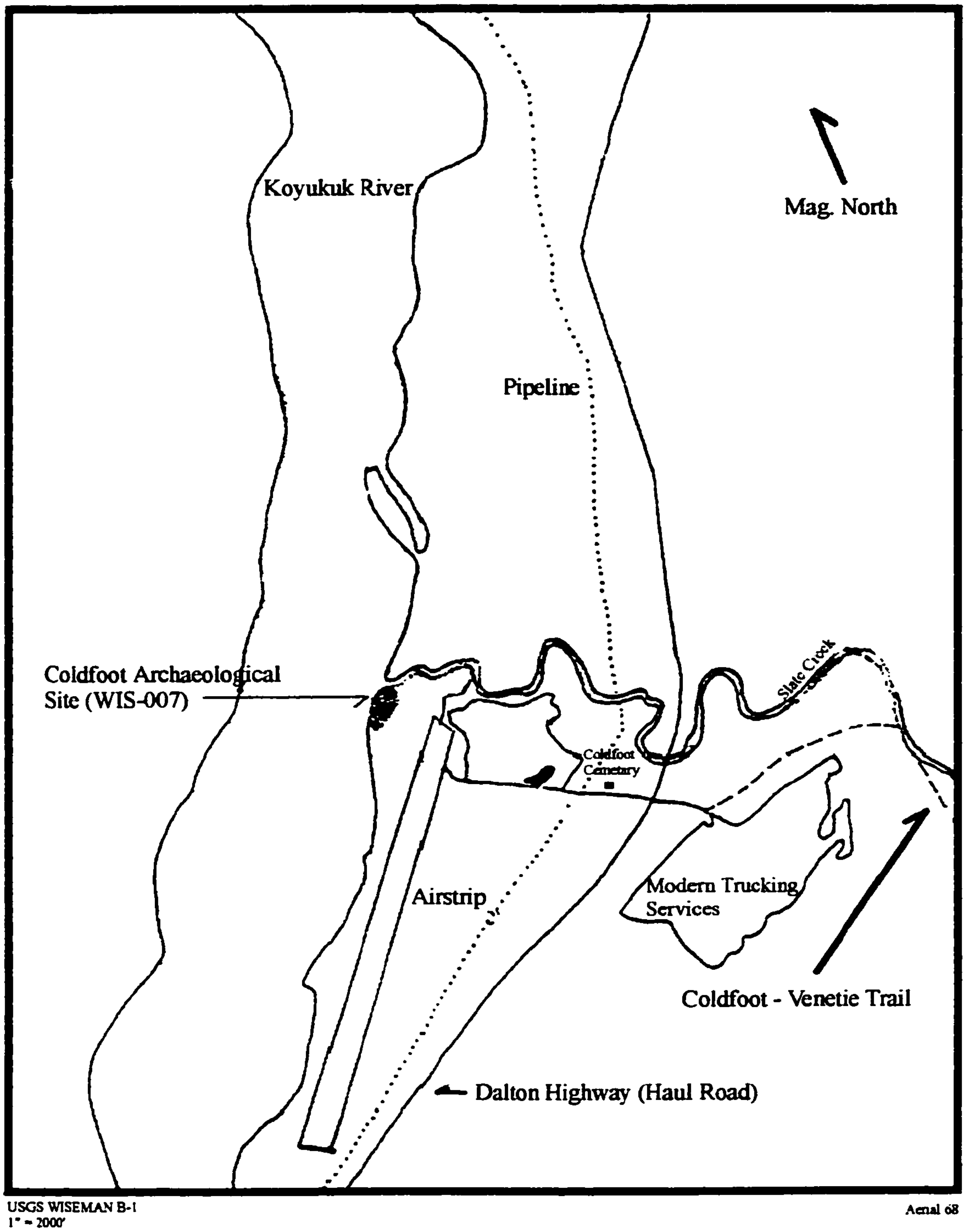


Figure 2.1 Coldfoot archaeological town site (WIS-007) at the mouth of Slate Creek, in relation to the contemporary airstrip, oil pipeline, highway, and trucking services.

(Coldfoot Feature 20; see Figure 2.2 for this and other cultural features referred to below), the site was resurveyed, which resulted in the location of additional features, and the site was re-mapped by compass and meter tapes. Numerous tin cans (selected, well-preserved examples) and a few other artifacts were collected from the inventoried trash pit feature. No report was generated by these efforts, although the field notes, artifacts, and photographs are presently on file and available at BLM, Fairbanks.

The site was next visited during the summer of 1994, when I directed a University of Alaska Fairbanks Summer Sessions archaeology field school at the site for four weeks. Nine field school students and volunteers completely excavated one structural foundation (Coldfoot Feature 1) and one natural depression filled with trash (Coldfoot Feature 3). The excavation of Coldfoot 1 proceeded after establishing a grid of 1 x 1 m units over the foundation, the grid being oriented to magnetic north. Excavations were carried out entirely by trowel, and all artifacts uncovered *in situ* in Coldfoot 1 were three-point plotted with reference to an established site datum. Owing to the perceived shallowness of the deposits in the trash pit Coldfoot 3, the deposits were removed en mass without the aid of a grid. All sediment from both excavations were screened through a ¼" wire cloth. Any artifacts from Feature 1 found in the screen were bagged by the 1 x 1 m excavation unit and stratigraphic level from which they derived.

During the summer of 1995, I directed two additional UAF archaeology field schools, eleven weeks of which were conducted at Coldfoot. During the time at Coldfoot, fourteen students and volunteers completely excavated four more structural foundations (Coldfoot Features 4, 5, 7, 14) and three cultural pits filled with refuse (Coldfoot Features 6, 10, 16). Two other refuse deposits were sampled (Coldfoot Features 17, 25) (see Figure 2.2). Coldfoot Feature 17 is a culturally-dug pit filled with refuse which was eroding out of the Koyukuk River cut bank. A select few items were collected from what had already eroded, mostly the complete items or items with brand names or other data relating to manufacturer.

Coldfoot Feature 25 was a large concentration of refuse spanning ca. 20-25 m of a

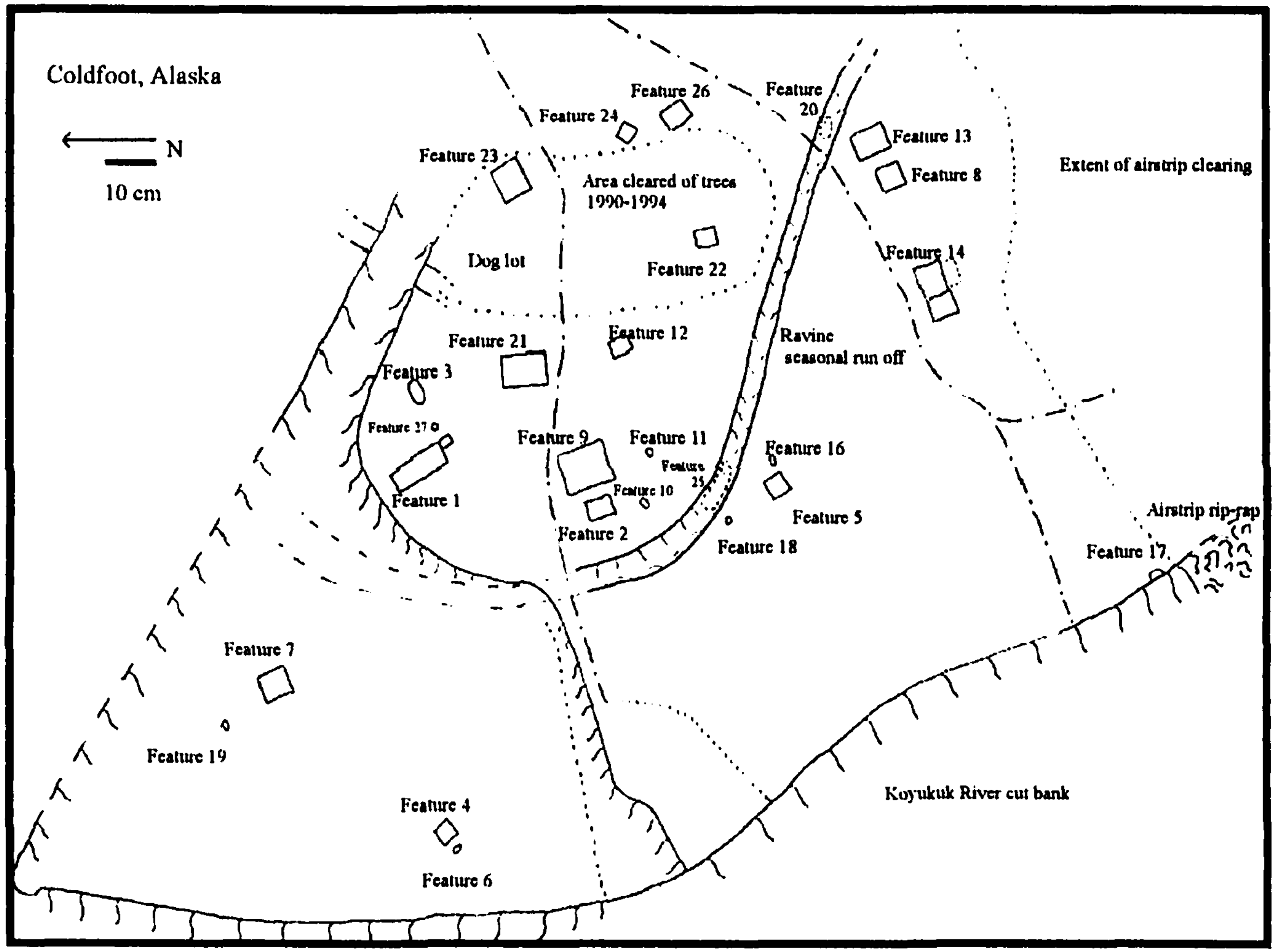


Figure 2.2 Coldfoot (WIS-007) site map; including all surficial cultural and natural features.

natural ravine situated just north of the Coldfoot Feature 5 foundation. While the "feature" itself was not directly sampled, a recently-made pile of broken bottles at its edge was collected. This pile of glass was likely the result of contemporary looting activity from this bottle-glass rich feature. In order to examine Coldfoot 25's potential contents (later sampled more rigorously in 1997 - see below), the glass from this "looter's pile" was collected, separated into different bottle glass colors, weighed, minimum numbers of individuals tabulated by lips, bases, and probable body weight, and then discarded. One complete example of each unique type of bottle base mark and bottle lip was saved.

In addition, one-half of a cultural depression that turned out to be a privy hole was excavated (Coldfoot Feature 11). Material samples from this feature were taken and sent to the University of Texas A&M Pollen Laboratory for analysis. Results from this exercise are presented in Appendix A, and include several varieties of local and imported berry and vegetable seeds, fish bones and small fragments of mammal bones, as well as small quantities of wood, charcoal, glass, and newsprint.

Excavation of all foundations and refuse pits were conducted in the same manner as Coldfoot 1 foundation and Coldfoot 3 refuse pit, described above. The sole exception to 1994 methods was that the 1995 foundations's 1 x 1 m excavation grids were aligned with the foundations themselves, not to magnetic north as was the case with Feature 1, in order to facilitate excavation. Also, all features found during the earlier 1980 and 1989 BLM surveys were re-located with the aid of who conducted that work (John P. Cook 1994 personal communication; Charles Adkins 1995 personal communication). All these features were located with reference to the site grid, site datum, and multiple subdatums by means of a surveyor's transit. Relationships to contemporaneous dirt roads and other natural and cultural features at the site are illustrated in Figure 2.2.

Finally, in 1997 another UAF archaeology field school under the direction of M.A. Sweeney returned to Coldfoot for four weeks of excavation. This crew completely excavated a functionally-unidentified cultural depression (Coldfoot Feature 18), foundation Feature 12, and dug a 1 x 5 m. trench through the refuse-filled ravine, Coldfoot 25[1].

Wiseman (WIS-280)

Bureau of Land Management archaeologists first visited Wiseman in the 1970s to conduct a survey and architectural recording of the standing structures. This was done in conjunction with a successful bid to have the entire town site nominated to the National Register of Historic Districts, and to convey the individual town site properties from federal to private management (Susan Will, personal communication 1998). No archaeological testing was conducted at that time, and as far as I know, the only systematic testing and archaeological excavations in Wiseman are those conducted by the 1995 UAF archaeology field school. Tanana Chiefs Conference (TCC) archaeologist Robert Sattler passed through Coldfoot en route to Wiseman to conduct an archaeological assessment of a cabin foundation situated on a Native Alaskan allotment being sold in the town site. While visiting the UAF Coldfoot excavations, Sattler and I agreed to excavate as much of the Wiseman cabin foundation (Wiseman Feature 1) as could be done in one week's time. This effort resulted in the partial excavation of the foundation, along with a systematic metal detector survey around the foundation, and a sampling of a refuse scatter located nearby. The metal detector survey was only attempted at Wiseman (supplied by TCC), and was conducted primarily as a test to locate buried (metal) material items outside of clearly-defined features. The test demonstrated a light metal refuse sheet outside the confines of the well-delimited, surficial features.

Tofty (TAN-009)

Systematic archaeological field work first began at Tofty in September, 1994, when BLM archaeologist Howard Smith, myself, and two other volunteers spent two days surveying and mapping the old town site (Figure 2.3). Mapping was accomplished with compass and meter tapes. At that time, three foundations were located (Tofty Features 1, 10, 19), two square log-cribbed (probable) mine shafts (Tofty Features 15, 16), two other cultural pits without refuse (Tofty Features 11, 30), and 17 refuse concentrations either in natural depressions (Tofty Features 7, 8), cultural depressions or pits (Tofty Features 6, 12), or else directly on the ground surface (Tofty Features 2, 3, 4, 5, 13, 14, 21, 22, 23, 26, 27, 28, 29). In addition, one shallow cultural trench (Tofty Feature 17), one large rectangular cast iron stove (Tofty Feature 9), two possible boilers (Tofty Features 20, 24), and a few isolated surface artifacts (Tofty Features 18, 25, 31) were mapped. In 1996 and 1997, two additional foundations (Tofty Features 32, 34) and one surface refuse scatter (Tofty Feature 33) were located.

In 1995, two weeks of excavation by UAF's first summer session archaeology field school resulted in the near-complete excavation of Feature 1, with the remainder of the foundation situated under berms of (probable) bulldozer spoil associated with maintenance of the dirt road that runs through the site. Excavation of this foundation proceeded in the same manner as described above, that is, laying out a 1 x 1 m. grid (oriented to magnetic north), three-point plotting all *in situ* artifacts, and bagging of all artifacts by excavation unit and layer found in the ¼" screens.

In late summer 1996, five UAF volunteers excavated most of foundation Tofty Feature 10 during a two week effort, and BLM archaeologist Howard Smith and I excavated a refuse-filled depression (Tofty Feature 12). Upon excavation, this latter depression turned out to be a refuse-topped privy hole (Mills and Smith 1997). Finally, during summer 1997 another UAF archaeology field school, under the direction of M.A. Sweeney, visited the site for two weeks. This crew excavated the remainder of Tofty

Feature 10 not excavated during the previous year, completely excavated cultural depression Tofty Feature 11, located and tested foundation Tofty Feature 34, and excavated a 1 x 2 m block inside of refuse Tofty Feature 2. The 1996 and 1997 research was not conducted in time for inclusion in the present study.

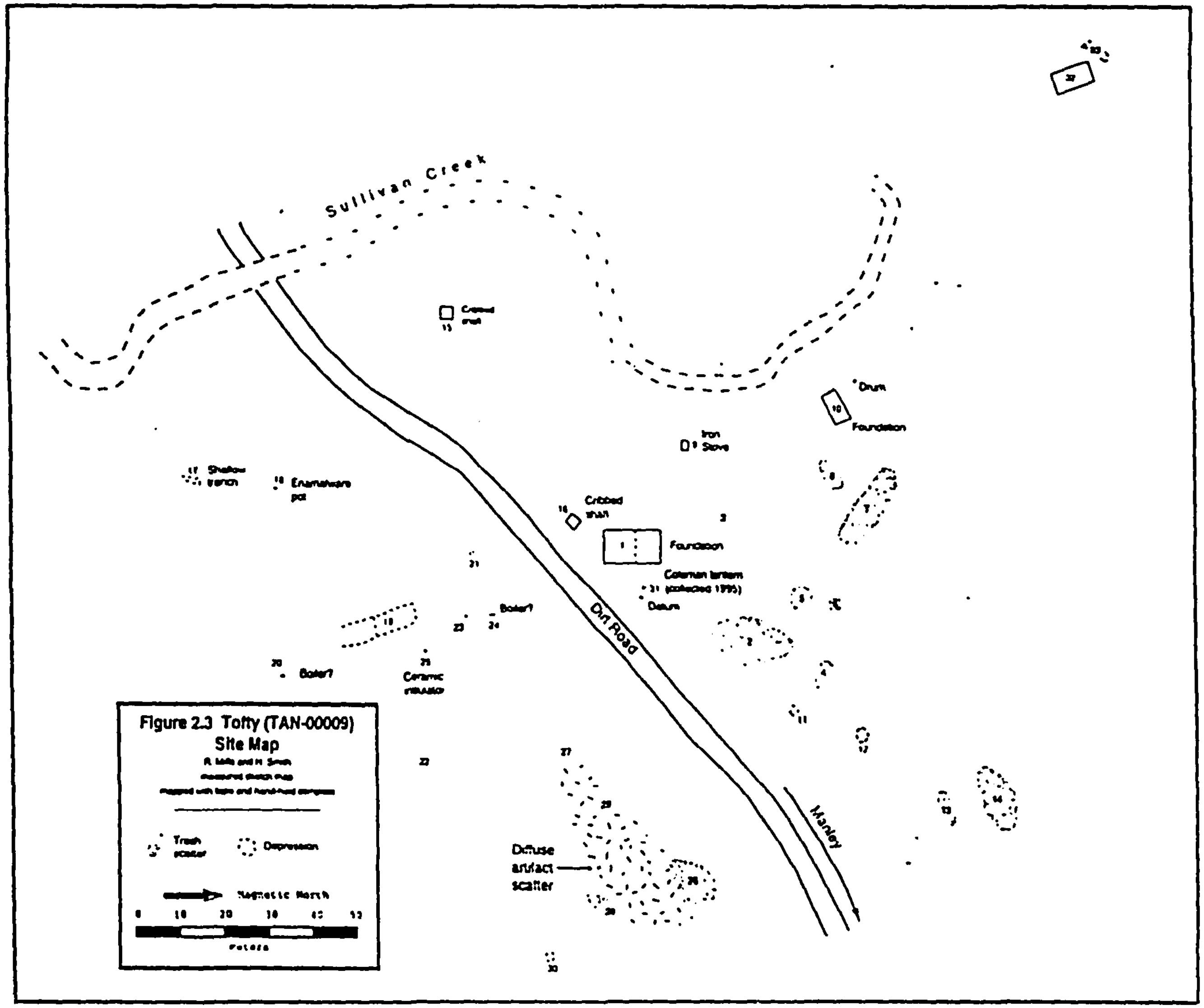


Figure 2.3 Tofty (TAN-009) site map, including all surficial cultural and natural features.

ARCHAEOLOGICAL FEATURE CHRONOLOGY

About 935 artifacts contain information that provide chronological information, sometimes with multiple observations per artifact. Such information includes datable maker's marks, U.S. registered patent and trademark dates, artifact technological changes, manufacturing companies's known date ranges, known product and brand name date ranges, and coin dates. Figure 2.4 presents estimated date ranges for each of the systematically excavated features. Where applicable, these data are presented in terms of spatially associated features,. Thus spatially associated Coldfoot Features 4 and 6 and presented together, as are Coldfoot Features 10 and 11, Coldfoot Features 5 and 16, and Coldfoot Features 1 and 3. The data for Wiseman include only those items excavated in

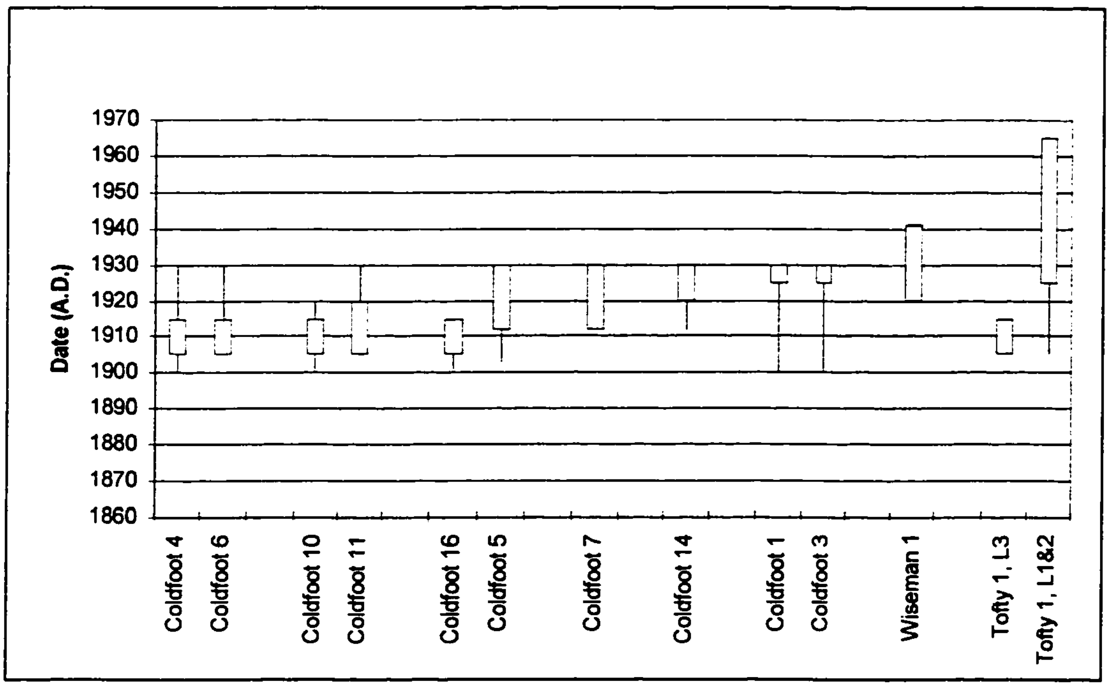


Figure 2.4 Estimated chronology of the excavated features in Coldfoot, Tofty, and Wiseman, based upon data supplied by the artifactual assemblages, both conservative (extending lines) and refined (boxes).

and immediately around the Feature 1 foundation, and excludes those non-systematically collected from associated nearby refuse scatters. Figure 2.4 presents two age range estimates per feature. First, a "conservative" age range estimate is based solely upon all chronological data without regard to quantities of artifacts providing the date, nor type of artifact supplying the date. The conservative age range is illustrated by the lines extending from the boxes in the figure. Also, a more precise age range estimate is provided in the form of the "boxes" in the figure. These estimates are based upon a closer examination of the range of available dating information, and the kinds and numbers of artifacts supplying the data. For example, I would be more inclined to date a feature by the number and dates of its rapidly disposal refuse (e.g., milk cans; coffee cans) than by patent dates on highly valuable and durable items. All manner of dating information were used in these evaluations, including mostly makers marks and datable changes in manufacturing techniques (e.g., bottles; tin cans). The latter "more precise" age range determinations are based upon researcher judgment, and did not use any statistical analysis or computer program. The features in Figure 2.4 are arranged chronologically from left to right based upon the more-precise estimates (boxes). The older age range estimates for the features were "cropped" at the date of the founding of a settlement (i.e., Coldfoot, in 1899; Tofty in 1907; Wiseman, ca. 1905) if the artifactual age estimates were older than these founding dates.

ARCHITECTURAL DETAIL

Seven structural foundations were partially or wholly excavated during the 1994-95 field seasons, one each in Tofty (Tofty Feature 1) and Wiseman (Wiseman Feature 1), and five in Coldfoot (Coldfoot Features 1, 4, 5, 7, 14). Numerous late-nineteenth and early-twentieth century cabins and structures have been assessed and described in varying degrees of architectural detail, such as are found in the Alaska Historical Register Survey files, located in the State Historic Preservation Office, Anchorage. These reports predominantly focus upon above-ground, above-floor details. However, archaeological excavation has the potential to provide foundation and sub-floor details not often accessible to architectural researchers who describe more-complete structures, or to surveyors who have limited time in the field. In fact, only a very limited number of excavations focusing upon the turn-of-the-century interior Alaskan mining scene have thus far been conducted (this report aside), including one other interior mining settlement (Fairbanks: Bowers and Gannon 1997), and a select few isolated prospector's or miner's cabins located along creeks (Kobuk River unpublished data, Douglas Anderson 1996 personal communication; Fish Creek drainage north of Fairbanks, Sattler et al. 1994). Brief architectural accounts of each foundation are presented below, and in detailed description in Appendix B, to provide comparative date to these and other excavated miners's cabins and settlements elsewhere (e.g., Cheney 1992; Holmes 1983, 1989; Lawrence 1995, and in press; Nayton 1992). The data presented below and in Appendix B are summed up in Table 2.1. In short, the pattern emerging from these data is that there is no pattern of cabin foundation construction in interior Alaskan mining settlements: variability seems to be the rule, not the exception.

Coldfoot Feature 1

Coldfoot 1 is a three-roomed structural foundation oriented northwest-southeast, including two larger rooms to the southeast, and a smaller adjoining shed structure at the northwestern end (see Coldfoot Feature 1 in Appendix B, and Figure B.1). The separate rooms were distinguishable by the manner and layout of the foundation sill logs, first wall logs, floor joists system, and remnant floor boards found within the confines of this structure. The total foundation measured 11.4 m, and measured variably 3.5 m wide for the northwestern shed and the middle room, and 3.25 m for the southeastern-most room. The wood illustrated in Figure B.1 (Appendix B) are all that remained of this foundation's

Table 2.1 Summary of architectural details of Coldfoot, Tofty, and Wiseman excavated structural foundations.

	CF 1	CF 4	CF 5	CF 7	CF 14	Tofty 1	Wiseman 1
floor area (m^2)	32.78*	10.41	9.83	23.79	27.71	37.31**	58.5*
floor joists	Y	Y	Y	Y	Y	N	Y
floor joist pads	Y	Y	Y	N	Y	N	N
tiered joists	N	N	N	N	N	N	Y
sill log pads	N	N	N	N	N	Y	N
bark on logs	Y	N	N	N	N	N?	N
subterranean storage	Y	Y	N	N	Y	Y	Y
adjoining shed	Y	N	N	N	?	N	Y
adjoining entry room	Y	?	?	?	Y?	?	?
corner post	N	N	N	N	N	Y	N
dorsal saddle notch	N	N?	Y	N	?	N	Y
ventral saddle notch	Y	N?	N	Y	?	N	N
dorsal & ventral s.n.	N	N?	N	N	?	N	N
local sawn floor boards	?	Y?	Y	Y	Y	N	Y
refined milled lumber flr.	?	N?	N	N	N	Y	N
tongue-&-groove flr.	?	N	N	N	N	Y	N
doorway notch	N	N	Y	Y	N	N?	N?
window glass	Y	Y	Y	Y	Y	Y	Y
gravel fill between joists	N	Y	N	N	Y	N	N
gravel pad for stove	N	N	N	Y	N	N	N
sheet metal roofing	Y	N	N	Y?	N	Y	N
fuel can panel shingles	Y	Y***	N	N	Y	N	Y
corrugated sheet metal	N	N	N	N	N	Y	Y?

* Habitation room areas only. If shed areas added on: Coldfoot (38.69 sq.m.), Wiseman (75.77 m^2).

** Based upon estimated floor size from exposed sill logs.

*** Present in associated Feature 6 refuse pit.

structural elements, the remainder being scavenged in the past. This foundation also had an "arctic entry" adjoining to the short-axis southeastern sill log, a small enclosed area constructed around the outside of the main entrance of a cabin, which indicated the placement of the door into this structure. This foundation also has an intact subterranean cold storage box set near the center of the southeastern-most room. Coldfoot 1 is associated with trash pit Coldfoot Feature 3, which is described in detail in Appendix C. See Figure 2.2 for spatial layout of features at the Coldfoot town site.

Coldfoot Feature 4

Coldfoot Feature 4 is either the foundation of a one-room structure, or else the foundation platform upon which some other more ephemeral structure was built, such as a wall tent or else a combined low-wall and tent structure (see Coldfoot Feature 4 in Appendix B, and Figure B.2). The foundation measured only 2.94 x 3.53 m., and consisted of sill logs, sill log pads, floor joists, joist bearing pads, and a small intact subterranean cold storage box. The door or entry to this foundation was likely south-facing, as the insulating earthen berm set around the outside of this foundation was missing from this location. The wood illustrated in Figure B.2 (Appendix B) was the only wood uncovered during the foundation's excavation. This feature was associated with trash pit Coldfoot Feature 6, which is described in detail in Appendix C. See Figure 2.2 for spatial layout of features at the Coldfoot town site.

Coldfoot Feature 5

Coldfoot Feature 5, a one-room structural foundation measuring only 3.14 x. 3.13 m, was the only excavated structure in Coldfoot that contained any appreciable quantity of collapsed wall and roof logs (see Coldfoot Feature 5 in Appendix B, and Figure B.4). Excavation revealed sill logs, in situ first wall logs above each of these sill, a complete *in* *situ* wooden floor, and a series of floor joists. Only the sill and wall logs, and sub-floor joist system are illustrated in Figure B.4 (Appendix B). The notch indicating the placement of the door way is cut out of the northern sill log. Placement of the stove is likely indicated by a concentration of charcoal flecks found beneath the floor boars. This foundation is associated with cultural pit Coldfoot Feature 16, which may have served as an outdoors subterranean storage pit, which is described in detail in Appendix C. Immediately north of this foundation and cultural pit is a large natural ravine, in which is 25 linear meters of deposited refuse, presumably deposited at least in part by the previous occupants of Coldfoot 5. This section of trash-filled ravine, designated Coldfoot Feature 25, was tested in 1997, and was not catalogued in time for use in this study. See Figure 2.2 for spatial layout of features at the Coldfoot town site.

Coldfoot Feature 7

Coldfoot Feature 7 is a one-room structural foundation measuring 4.39 x 5.42 m, which upon excavation revealed sill logs, fragments of *in situ* floor boards, a series of floor joists, and the displaced first wall logs of the long-axis walls (see Coldfoot Feature 7 in Appendix B, and Figure B.5). The wood illustrated in Figure B.5 (Appendix B) was the only wood uncovered during the foundation's excavation, excepting a few small scattered fragments of logs and floor boards. A notch cut out of the southern sill log indicates the placement of the door way. A raised gravel and cobble pad set between two floor joists likely served as a platform for the stove. No other apparent features are associated with this foundation, excepting possibly cultural pit Coldfoot Feature 19, which was not excavated. See Figure 2.2 for spatial layout of features at the Coldfoot town site.

Coldfoot Feature 14

Coldfoot Feature 14 is a foundation representing the main habitation room of a two-room structure. The adjoining room or structure (Coldfoot Feature 15), delimited by insulating earthen berms, was not excavated (see Coldfoot Feature 14 in Appendix B, and Figure B.6). Coldfoot 14 likely represents the main habitation room of this two-room structure because of the large subterranean cold cellar located in the southwest corner. Coldfoot 14's structural remains measured 4.52 x 6.13 m, and included sill and first wall logs, an *in situ* section of floor boards as well as a large section of floor boards that had collapsed into the large cold cellar depression, and a series of floor joists and joist bearing pads. No cut door notch was found, although the western sill log was not excavated. The placement of the door way is likely associated with a gap in the insulating earthen berm shared by both Coldfoot 14 and Coldfoot15. The wood illustrated in Figure B.6 (Appendix B) was the only wood uncovered during Coldfoot 14's excavation. The only apparent cultural features in the vicinity are unexcavated foundations Coldfoot 8 and Coldfoot 13, situated to the northeast. See Figure 2.2 for spatial layout of features at the Coldfoot town site.

Tofty Feature 1

Tofty Feature 1 is a (likely) two-room structure, of which only one room was excavated. The unexcavated smaller room is indicated by intermittent insulating berms of earth situated north of and adjoining to the excavated larger room. Excavation of the larger room revealed sill logs, some first wall logs, an *in situ* section of floor boards in the southwest corner, a series of grouped sill bearing pads, and an intact subterranean cold storage box located in the center of the room (see Tofty Feature 1 in Appendix B, and Figure B.7). No door way break occurred in the excavated western, northern, and eastern sill and wall logs, nor in their insulating earthen berms. The door to this structure therefore was in the southern, unexcavated wall, whose berms of insulating earth, if present at all, are now obscured by piles of contemporary bulldozer spoil. An unusual stacked pole feature was found buried beneath the confines of Tofty 1, which, based upon stratigraphy, pre-dates the construction of the Tofty 1 structure. This pole-feature is described in detail in Appendix C.

Lack of time at this site prevented the complete excavation of this room of this structure, such that the southern sill log and adjacent excavation units were not excavated. However, exposure of the sill logs indicated that this room measured 5.83 x 6.4 m. Oral sources indicate that this foundation was a partially standing, partially scavenged structure that burned to the ground in 1969 when a forest fire destroyed what was left of the old town site. Evidence for this fire was abundantly clear during excavation, illustrated by numerous charred logs scattering within the foundation, charcoal, charred floorboards, and melted glass. The spatial relation of Tofty 1 to other features at Tofty are illustrated in Figure 2.3.

Wiseman Feature 1

Wiseman Feature 1 is a two-room structure measuring ca. 8 x 10 m, comprised of a large main habitation room, and an adjoining shed or overhang structure along its western side. Owing to lack of time, only 24 m^2 in the southern portion of this foundation were excavated. A large subterranean cold cellar was situated in the northern portion, which remained unexcavated owing to the presence of potentially hazardous materials within it. Excavation revealed sill logs and first wall logs, a system of joists some of which was tiered three logs in depth, joist bearing pads, and sections of intact floor boards in the western portion of the excavation (see Wiseman Feature 1 in Appendix B, and Figure B.8). Gaps in the insulating earthen berms surrounding this foundation indicate the locations of two possible door ways, one at the eastern end of the north wall and one at the southern end of the east wall. A bench or table-like feature was also partially excavated, located adjacent to the southern wall outside of the confines of the foundation. This feature, with the rest of the Wiseman 1 excavation, is described in detail in Appendix B.

LOCAL MANUFACTURE & RE-USE

One aspect of the artifacts that was readily apparent to both excavators and cataloguers dealing with the Coldfoot, Tofty, and Wiseman artifacts was the amount of material that indicated local production and repair of goods, and re-use of raw materials. What potential variables are involved with raw material re-use and local production of material goods? Is the occurrence of re-use and local production more characteristic of a rural rather than an urban setting? Does it increase with increased degree of geographical or transportation/communications isolation? Are ethnicity, social status, and occupation factors? Are time and geographical regions factors? What materials are being used most? the least? As it is the purpose of this chapter to provide details and data useful for comparative purposes to other sites, this issue is discussed further below.

Items in this brief discussion are divided into three categories: (1) locally-produced items (i.e., non-industrially manufactured and imported), (2) raw material detritus from such production, and (3) evidence of other local handicraft activities. In order to assess the prevalence of each of these categories, all 18,749 artifacts in this study were scored with a secondary "5I1" code, in addition to the artifact's primary classification code (code 5I1: Commerce & Industry, Manufacturing, Handicraft; see Appendix D). This secondary scoring of all artifacts is not presented in this study. This is, an object was provided a secondary code of "5I1" if (1) it was recognized as a locally made item, (2) it represented raw material detritus from a local manufacturing process, or (3) it provided some other evidence of local handicraft activity.

Ultimately, 1182 items were scored as "5I1" in this manner, representing 6.3% of the entire assemblage. Most of the material used in such local production efforts were non-local in origin. That is, other imported items or their components were re-used as raw materials (e.g., metals, rubber, etc.). In a few cases, locally available materials such as antler, bone, and water-worn cobbles were used, though these were few in number. All excavated features that have been discussed above, from all three sites, contained such "5I1" materials, excepting the privy, Coldfoot 11. All manner of raw materials were re-used, including (in descending order of occurrence) metal (882), leather (187), wood (60), rubber (43), woven cloth (19), birch bark (5+), bone (5), lithic (3), lead (2), antler (2), clay/chalk/? (2), felt (2), plastic (2), enamelware (2), other textile (1), ivory (1), unidentified organic (1), and unidentified (1). The fact that several of the items were made up of more than one type of material means that the numbers listed separately here do not add up precisely to the 1182 artifact total provided above. Organic items representing local production or procurement of food resources are not discussed at this time, such as berry seeds as representative of either gardening or food gathering, or faunal remains as representative of hunting.

Locally-Produced Items

Items made wholly or partly from metal formed the largest class of locally-made items, some of which can be identified and others not. Such hand-made items include: possible money clips (thin, bent over metal sheets with rounded ends); foundation sill log protective flashing (from sheet metal); hinges, both finished and in production (bent over flat metal with slot cut out of the bend); braces (e.g., for shelves); a winged plow head in Wiseman (with solid, non-moveable wings; garden-sized; from cut thick metal sheet); a thin rod with nail soldered at an angle at one end (some type of handle or latch opener); several small metal boxes (cut out sheet metal, lapped seams, hand soldering and hand riveting); variously sized cylindrical cans and one cook pot with top ends removed and many holes punched through the bottom (strainers? plant holders?); home-made buckets from 5-gallon fuel cans and cylindrical cans with top ends removed and hand-made bail through punched holes near the upper edges; a 5-gallon fuel can with one side panel sliced down the middle and folded back associated with a pile of bone meal and fragments (possibly used for heating/grease rendering?); a bodkin or punch made by inserting a screw into the base of a large centerfire cartridge after its head plate was removed (screw secured by pinching of cartridge and internal wax fill); and variety of wire objects. Regarding this last class, besides a wide range of wire looped or wound around and around in small bundles (including hanger, bailing, and packing wire), wire was also fashioned into: a variety of hooks, a possible hand made gun or rifle cleaning rod, and a number of complete and fragmentary "loop-fasteners." This latter category is formed by fastening a section of wire around two objects (e.g., poles, rafters), and securing/twisting the two ends of the wire together. Then, a stout but thin stick is placed in the middle of the wire loop, and wound around and around thereby winding the wire tighter and tighter, and binding together the two objects that the wire was originally looped around.

Simple modification to existing items includes piercing/drilling a 1861 half-dollar and clay/chalk (?) poker chips for dangling; a can with four clustered nails protruding through it from the inside (as for securing to a wooden post or board); and nails intentionally bent into hooks or "fish hook" shapes. One other commonly found expedient tool was the modification of items into stove pipe "safeties." Safeties are variously-shaped items used to guide a stove pipe through the ceiling/roof of a structure, thereby preventing it from touching the wooden roof/ceiling of a structure. No imported, machine-manufactured safeties were found in any of the excavated features, only hand-made varieties. Simple ones were made from cutting circular or slightly oval holes in pie plates, a tea pot (with spout and base removed), an enamelware bowl, as well as several 5-gallon fuel cans with one end removed and a hole cut through the center of the other. The latter type of safety, as I have ovserved in a variety of other settings throughout interior Alaska, was found inside of the Coldfoot 1 and 14 foundations, as well as located outside of the Coldfoot 7 foundation. Other more-elaborately made safeties included sheets of metal cut to size, with holes cut out of them, sometimes multiple sheets hand-riveted together, and another with a hand-cut sheet metal "collar" riveted onto and around the hole in a larger sheet for additional security. These sheet metal safeties sometimes had nails and nail holes around their perimeter to secure them to the roof, and in another instance thin cable was threaded through punched holes around the perimeter.

Another common handmade artifact class was the production of architectural shingles made from either the side panels of 5-gallon fuel cans, the sides of other industrial-sized boxes or metal canisters, or shingles simply cut from sheet metal.

Other composite metal items, or items made entirely from other materials, include: leather hand-made suspender straps; leather straps fashioned into handles for pull-drawers (some definitely from harness pieces); an antler-handled bodkin/punch with a piece of pointed metal inserted into it; a rectangular piece of leather with ends nails into adhering wood fragments which performed as a hand-made hinge; a complete wooden shelf; a horseshoe pad from thick leather used to keep snow out of the hoof; a possible knife sheath; complete toothed fleshers, one a small three-prong flesher from antler and the other a 5-6 prong flesher made from a large ungulate long bone; a variety of hooks and lures made from bone (or fine wood?), drilled, and with a small inserted metal hook, in various stages of completion; a home-made adze-chisel with sharpened blade fashioned from flat metal and attached to a piece of wood via wire; a fish-shaped pendant or lure hand-cut from a piece of flat plastic label; small tacks inserted into the bottoms of rubber boot soles for ice traction; and a complete berry brush fashioned from sheet metal, flat wood, and multiple lengths of straight wire.

Instances of repair include links of a (dog?) chain repaired together with wire; a break in a large section of draft horse harness repaired with wire; a harness pad with re-adjustment holes/slits cut into it; and a cylindrical tin can body whose both ends had been removed and whose body was re-sewn together lengthwise with wire.

Unidentified finished objects include: several sizes of tin cans or tobacco tins with numerous holes punched through around the upper rim; a leather boot upper cut into a rectangle, folded over, and hand-riveted together; an iron rod bent into a circle; a hand-welded/soldered pipe or tube, consisting of four sections soldered together (each section itself soldered together lengthwise) and wrapped in building paper; an oval, finely cut leather object with hand punched holes; a tiny linear fragment of worked ivory with straight parallel sides, broken at one end and filed to a dull point at the other; and a finely-carved and complete bone object shaped like a butter knife (?). This latter object was carved from the rib of a medium-large mammal. Suggested functions for this unidentified object include a knife, a letter opener, and a quill working tool.

Raw Material Detritus

Refuse resulting from local production was much more abundant than the actual items themselves that were made. To begin, all manner of available thin metal sheets were re-used, including regular cylindrical tin cans, small pocket tobacco tins, large rectangular 5-gallon fuel cans, stove pipe sections, and ordinary flat sheets of metal. Evidence of re-use, as opposed to simply fragmentary remains resulting from *in situ* rusting and degradation, was typically recognized not only by the cutting or hand-shearing of these items, but also by hand-punched holes. Hundreds of fragments of cut metal were found, ranging from small geometric pieces (triangles, squares, rectangles, variously shaped polygons, circular), to thin strips, circular cut strips, and other scrap. Such pieces were typically small (centimeters), but ranged up to large sheet metal sections close to a meter in some dimensions. Sometimes most of a cylindrical can or fuel can remained, with evidence of a section being sheared from it. Cans were found with their crimped ends removed either by shearing or intentionally disengaging the crimped seams, and many more such ends of cans were found than bodies to go with them. A few cases of cans indicated that the ends had been removed, and the body unfurled and made flat. Also, squared corner sections of sheet metal which had circular sections sheared from them were found in several features, but particularly in the trash pit Coldfoot Feature 3. Also found in this feature were two sheet metal circles 27.5 cm in diameter, apparently the product of the aforementioned shearing exercise. The function of these are presently unknown.

In addition to the above artifact classes, other sources of metal indicative of shearing, drilling, etc. include cast iron stove fragments, cut metal rods and bars, numerous small sections of sled runners (cut, bent, extra drilled holes), barrel hoops (one apparently straightened and with hand punched holes, and possibly used as a re-enforcer), box nailers, thick pipes that had been sawn through (some threaded), sliced up metal wash basins, bed support straps, metal bodies of types of mechanical devices (e.g., clocks?; music boxes?), a brass comb, a sawn through valve barrel or fuel adjuster for some manner of stove or burning apparatus, and wire. This last category was also especially prevalent. Along with dozens of cut fragments of unidentified wire, many instances of cut and re-utilized coat hangers and bailing or packaging wire were recognized because of their distinctive, mechanically-twisted ends.

Next to metal, the next heavily used raw material is leather. Most of the leather identified to prior function were dog or horse harnesses, many with an assortment of buckles, rivets and metal keep rings still attached. Identified horse harness sections include saddle cinch straps, bridle straps, saddle straps, reins, and britchen sections (Tom O'Brien and Craig Gerlach, personal communication 1997). Such straps typically were simply cut through on one end, but in many instances had been cut lengthwise, had small sections cut from them, and exhibited hand-punched holes (i.e., as with a small thin pipe; cartridge?), hand-drilled holes (i.e., as with an awl or bodkin), and hand stitching. Other identified sources of cut or manipulated leather included suspender straps, human belts, a mitten, a possible baseball mitt section, and leather boot uppers. This last category, manipulation of leather boot upper, was evident not only by numerous sliced and cut up leather uppers, but also the rubber boots and rubber soles from which these uppers had been removed, as well as a variety of metal boot eyes and hooks that had been cut off/removed from these uppers. Many dozens of small cut fragments of unidentified leather were also found.

Most of the cut up rubber fragments that were unearthed could not be identified to original function, but those few instances that could were from Wiseman, and included sections of a rubber inflatable ball and a large cut section of inner tube. One final category that deserves mention is birch bark. Clear instances of birch bark use came from the "shed" extension at the northwestern end of the foundation, Coldfoot Feature 1. These pieces consisted of squared, cut sections with sides ca. 20-30 cm in length. No other modification or stitching was noted; they appeared to be prepared sheets for some unknown function. Small sawn wood fragments indicate some measure of wood working, as do cut cloth and felt fragments for those materials.

Other Local Handicraft Production

Besides tool types (code 5H1: Commerce & Industry, Construction, Tools) which are obviously indicative of local production efforts, a few other artifacts provide information relating to different handicraft or local manufacturing activities at the three mining communities investigated in this study. A small mass of tiny boot/shoe nails found rusted together into one conglomerate, in the Wiseman 1 foundation, at the very least indicates boot/ shoe repair, if not an actual shoemaker. Melted solder pieces are indicative of locally manufactured items such as those already referenced above (e.g., hand-made boxes, pipes). And lastly, several lines of evidence indicate instances of cartridge reloading, including a large mass of melted shot, centerfire cartridges with primers missing, isolated centerfire cartridge primers both fired and more importantly unfired, and couple of instances of unfired .22 cartridges with *in situ* bullets that have had their bases cut off, presumably to gain access to their gunpowder.

SUMMARY

In this chapter I provide baseline architectural and artifactual data from three interior Alaska placer gold mining settlements (Coldfoot, Tofty, and Wiseman). My aim is to provide a comparable archaeological data set to other researchers from a historical setting that has been largely ignored by previous archaeologists, i.e., placer mining settlements in the interior Alaska from the early twentieth century. My hope is that such comparisons might lead to a better processual understanding of other sites in Alaska and around the world.

Archaeological excavations in 1994 and 1995 at the three sites focused upon twelve features, including seven structural foundations, four trash pit features, and one privy hole. More than 18,700 artifacts unearthed in these excavations are provided in Appendix E. All manner of manufacturer and commodity data are also compiled, and are provided in Appendix F. Architectural remains from the seven foundation excavations are outlined above and provided in detail in Appendix B, and other excavated features geometric and descriptive data are provided in Appendix C. Results from the analysis of the one excavated privy, Coldfoot Feature 11, is provided in Appendix A. In addition, a basic historical and transportation-related chronology is provided in Chapter 2 for each of the three excavated settlements, along with the history of excavations at each site, and the excavated features's estimated chronology based upon their artifactual content.

Besides these basic data and information, one additional brief discussion provides information assessing local manufacturing and re-use of raw materials at these three sites. This section discusses the type and degree of local manufacturing, re-use of raw materials, and repair seen in the three excavated sites's (Coldfoot, Tofty, Wiseman) artifactual assemblages. Succinctly, 1182 artifacts exhibited some manner of hand made production, repair, or re-use, totaling 6.3% of the total assemblage from these three sites. All manner of raw materials were re-used and found as either finished, recognizable objects, or else as raw material detritus left over from some local production activity. Metal was the predominant raw material re-utilized, followed by leather, wood, rubber, and trace amounts of 14 other raw material types. Discussion was broken into three broad topics, centering around the nature of finished locally produced items (i.e., those items not industrially-manufactured and imported), raw material detritus remaining from local production activities, and evidence of other local handicraft activities.

CHAPTER 3

ABANDONMENT AS A SOURCE OF ARCHAEOLOGICAL VARIABILITY

In this chapter I focus on processes relating to the abandonment of the excavated foundations and trash pits from Coldfoot, Tofty, and Wiseman. More specifically, I discuss how decisions relating to curation and scavenging of architectural and artifactual materials directly affected the formation of the archaeological record at these three mining town sites. I examine how curation and scavenging, within the specific historical settlements at Tofty, Coldfoot, and Wiseman, influence a variety of artifact attributes; for example: the numbers of usable or functional artifacts in features; changing numbers of these usable artifacts in foundations occupied at different points in time; the size of usable artifacts; and spatial arrangement and distribution of artifacts within structures.

Generalizations derived from published abandonment literature serve as a basis for the formulation of archaeological "expectations" against which the excavated features in the specified historical settings are measured. In one case, we are faced with a situation with no appropriate analogues in the available abandonment literature. In particular, I refer here to the removal/scavenging of wooden floor boards from structural foundations, and the resulting influence of this behavior on the spatial patterning of any artifacts on those floor boards. Without alternative recourse, I am forced to postulate "logical" spatial patterns for artifacts affected by such floor-removal processes. The appropriateness of this approach to modeling can only be judged against future data and analyses.

All archaeological "expectations" derived here (those related to usability, size, and spatial patterning) are evaluated against archaeological data derived from the 1994 and 1995 excavations at Coldfoot, Tofty, and Wiseman. The scale of analysis of this aspect of the study by necessity focuses on the excavated foundations and trash pits, that is, at the archaeological feature level. I also discuss, in part, how past decisions are made at the settlement level, as well as at the local or mining district level of analysis.

The discussion in this chapter is organized in the following sequential sections:

(1) *A Brief Overview of Archaeological Abandonment Research:* this section is supplied in order to familiarize the reader with pertinent sources of abandonment-related research. A short list of key abandonment definitions is added in this brief background section, and may be referred to when necessary by the reader.

(2) *Abandonment At Coldfoot, Tofty, And Wiseman: Curation & Scavenging:* Second, a review of archaeological, historical, oral, and environmental data from Coldfoot presents a context-specific scenario for curation and scavenging at this one town site, conditions which are also assumed for the two foundations excavated in Tofty and Wiseman. These assumed conditions include (a) the gradual, prolonged degree of curation associated with the Coldfoot foundations and their artifactual contents, along with (b) a period of scavenging of the architectural structural wood and (likely) artifactual contents of the excavated foundations analyzed here. This Coldfoot-focused curation and scavenging scenario is presented in detail in order to confirm the assumed abandonment conditions inherent in both the archaeological hypothesis, presented in the third section of this chapter (see below), and its nine "expectations."

(3) *Archaeological Abandonment at Coldfoot, Tofty, and Wiseman:* The third section first involves presenting a simple diagram which models relationships among variables which influence material goods re-use. An archaeological abandonment hypothesis is presented specifically for the Coldfoot, Tofty, and Wiseman mining settlements, and a list of nine "expectations" is presented relating to various aspects of artifactual attributes, and their spatial arrangement within and among features.

(4) *Formulation of the Archaeological Expectations:* Fourth, the archaeological expectations are followed by a general review of the abandonment literature related to each set of expectations. This section provides a discussion about how the expectations were formulated through use of pertinent abandonment literature.

(5) *Evaluation of the Abandonment Expectations:* Fifth, each of the nine archaeological expectations is assessed in terms of archaeological data from the three early twentieth-century mining town sites.

(6) *Abandonment As A Source Of Archaeological Variability: A Summary:* A final section sums up the findings of this abandonment chapter.

Specific methods used in evaluating each of the nine archaeological expectations are presented below in the "Evaluation" section. While some of the evaluation discussions are relatively straightforward, that is, expectations are clearly "corroborated" or "falsified" given the presented evaluating criteria (cf. Popper 1965), other evaluation discussions are presented more as "exploratory" exercises. More specifically, I refer to the expectations dealing with relative quantities of usable versus non-usable artifacts in the excavated archaeological features, as well as usable artifact size ranges (Expectations #1 & 2). These discussions are presented as exploratory examinations, removing and adding different variables in order to observe effects upon data evaluation methods and techniques. In short, as presented in Chapter 1 above, this "exploratory" effort is aimed specifically at elucidating appropriate evaluative methods for gauging individual abandonment-related variables (c.f., Binford 1978, 1981, 1989).

A BRIEF OVERVIEW OF ARCHAEOLOGICAL ABANDONMENT RESEARCH

Along with an array of other archaeological site formation and transformation processes, abandonment was early recognized as a significant process in the creation of variability seen in the archaeological record (e.g., Ascher 1968; Schiffer 1972, 1976). The investigation of the specific effects on refuse disposal of various types of abandonment activities, as well as the circumstances surrounding abandonment, are essential to understanding archaeological variability (e.g., Deal 1985; Hayden and Cannon 1983).

Early abandonment studies focused primarily on identifying those variables or processes that affect artifact assemblages during and after abandonment of archaeological sites (e.g., Bonnichsen 1973; Lange and Rydberg 1972; Longacre and Ayers 1969; Robbins 1973). Such studies more often than not served solely as "cautionary tales" to those doing prehistoric archaeological research. Research since the 1980s, in addition to such research, has also focused on (1) delineating specific relationships between social and environmental variables and resulting abandonment decisions, along with (2) any resulting effects upon material residues left behind at abandoned sites (e.g., Cameron and Tomka 1993, various papers; Gould 1987).

A more-thorough overview of archaeological abandonment method and theory is available in other studies (see especially papers and references in Cameron and Tomka 1993). Some of the key variables pertinent to abandonment of archaeological sites identified by other researchers include: (1) curation and delayed curation (e.g., Binford 1976, 1979; Tomka 1993); (2) lateral cycling, scavenging, collection and looting (e.g., Schiffer 1985; 1987); (3) caching (e.g., Baker 1975); (4) leaving or dismantling structures (e.g., Schlanger and Wilshusen 1993); (5) the cessation of typical disposal and maintenance activities and their effects upon the spatial distribution of primary, secondary, *de facto*, and abandonment refuse (e.g., Brooks 1993; Hayden and Cannon 1983; Schiffer 1976, 1985, 1987); (6) provisional discard (Deal 1985); (7) rapid or unplanned versus gradual or planned abandonment (e.g., Rees 1979; Schlanger and Wilshusen 1993; Stevenson 1982); (8) anticipation of eventual return (e.g., Stevenson 1982; Graham 1993); (9) whether a site is abandoned at one time or over an extended period of time (e.g., Lightfoot 1993; Montgomery 1993; Tomka 1993); (10) whether the responsible populations are mobile or sedentary (e.g., Kent 1993); (11) distance to the next anticipated habitation site (cf. Cameron 1991); (12) modes of available transportation (cf. Cameron 1991); (13) the involvement of ritualistic activities (e.g., Deal 1985; Kent 1984); (14) the land-use patterns of the responsible populations (e.g., Binford 1976, 1980; Graham 1993); (15) the "nature" of the abandonment process (i.e., episodic, seasonal, or permanent; e.g., Brooks 1993; Tomka 1993); and (16) anticipated versus actual length of site occupation (i.e., "anticipated mobility"; e.g., Kent 1991, 1992, 1993). Cameron (1991) also lists many causes of abandonment for individual structures and villages, derived from a meticulous review of the ethnographic literature, including numerous aspects of structural deterioration, internal social, political, and economic causes, and external social and environmental causes.

Finally, it has been demonstrated that abandonment operates at a variety of spatial and temporal scales. Spatial scales of analysis include the "activity area," structure, settlement, and region (Cameron and Tomka 1993). Likewise, abandonment also operates at a variety of temporal scales (e.g., Graham 1993; Rothchild et al. 1993; Stevenson 1982; Tomka 1993). As Tomka and Stevenson (1993:192) point out, earlier studies typically focused upon abandonment behavior associated with final, or "permanent," abandonment of a site. However, with many peoples, particularly mobile peoples, permanent abandonment of a site and its usable resources might not occur for many years, owing to a cyclical nature of landscape utilization at both short-term and long-term temporal scales (e.g., seasonal and generational rounds). Permanent abandonment of sites is more often the exception rather than the rule in many societies.

Abandonment Terminology

Before proceeding further, key terminology presented in the following pages need to be defined. These definitions are drawn from Schiffer (1985), and the reader is referred to this and other sources (e.g., Cameron and Tomka 1993; Schiffer 1987) for examples and additional references on these concepts. This short section is meant to familiarize the reader with basic concepts and vocabulary that are used in the following pages. These definitions are important because this chapter deals largely with distinguishing different types of refuse (i.e., primary, secondary, and *de facto*) as indicators of past conditions or processes (especially curation and scavenging) operating at the three mining settlements examined in this study (Coldfoot, Tofty, Wiseman).

- *Primary Refuse*: items discarded or lost at their location of use, and typically comprise few and only small items owing to regular maintenance activities. Such items are typically fragmentary and non-usable (Schiffer 1985:24-25).

- *Secondary Refuse*: items intentionally discarded away from their location of use or manufacture. Such items are typically fragmentary and non-usable (Schiffer 1985:30-31).
- *De Facto Refuse*: usable, functional items left behind upon abandonment. Such items are typically in a more-complete condition than primary and secondary refuse, and contain "remnant use-life" (i.e., usable, functional, less fragmentary). Such items have a higher degree of "restorability" relative to primary and secondary refuse, and have a high potential for scavenging (Schiffer 1985:26-29).
- *Abandonment Refuse*: items deposited during the abandonment process, resulting from a relaxation of normal maintenance activities. The amount of such refuse (whether primary or *de facto*) is dependent upon a variety of factors, including intended duration of abandonment, degree of planning of abandonment, and the distance and transport capacities to next intended site (Schiffer 1985:25).

Some factors that modify or deplete usable, *de facto* refuse include (Schiffer 1985:26-29):

- *Curation*: transferal of items away from one site, upon abandonment, to the next site by a site's occupants. Curation of at least some items typically occurs at all sites, except under catastrophic abandonment conditions when daily life routines are abruptly halted, and the site's occupants do not desire to, or else are unable to return to the site to retrieve their material belongings. Curation includes "delayed curation," that is, when curation of materials from a site occurs over more than one trip (Tomka 1993:11-14). Delayed curation is expected when distance to the next intended site is not great, and when the abandoned settlement is along well-traveled routes. Factors influencing any artifact's curation priority include size, weight, replacement cost, and remnant use-life (see also Schiffer 1985:31-38).
- *Scavenging*: within-settlement taking of, primarily, *de facto* refuse by site occupants other than the original occupants/owners. Scavenging typically occurs to replace broken and worn out artifacts, as well as to increase inventories of potentially useful items and materials. Since scavenging deals with intra-settlement transfer of materials,

transport costs (and thus size and weight issues) are negligible considerations affecting scavenging decisions. Therefore, artifacts with the highest replacement costs and/or remnant use-life have the highest scavenging potential.

- *Collecting or Looting*: the removal of objects by persons from outside of the settlement, both in the past as well as in the present. This is different from curation and scavenging: curation is performed by the actual people who occupied the sites and owned their material goods, and scavenging is conducted by later occupants of a site who are not the original owners of the artifacts.

CURATION AND SCAVENGING AT COLDFOOT, TOFTY, AND WISEMAN

In order to assess the nine specific abandonment-related archaeological expectations outlined below which are pertinent to the Coldfoot, Tofty, and Wiseman town sites (see below, "Abandonment At Coldfoot, Tofty, And Wiseman"), it must first be demonstrated that curation and scavenging actually occurred at these three mining settlements. The underlying presumptions of the expectations are that <u>both prolonged curation and scavenging took place</u> at these settlements. These two processes, therefore, need to be substantiated in the three mining town sites examined here.

On the basis of historical and archaeological evidence, both curation and scavenging can be demonstrated for all of the structural foundations excavated at the three mining settlements. Curation and scavenging is apt to occur readily under the historical conditions specifically pertinent to Coldfoot and Tofty, that is, a protracted abandonment phase where (1) the distance to the next intended site was relatively short, (2) where transport of goods was not a serious problem, and (3) where implied ownership of a cabin (if left at least temporarily standing) and any artifacts left behind within it were inferred to be owned by the former occupant, and thus not available for taking by others. It is argued here (see further discussion, below) that "implied ownership" of a structure and its contents occurred when direct sale or transfer to another party did not take place.

Aspects of these three conditions also affected Wiseman (which was never totally abandoned), and the excavated foundation in that town site.

Distance to the next intended site is likely not an issue for any of the excavated foundations. The distance between Coldfoot and Wiseman in only ca. 11 miles. Both Coldfoot and Wiseman were centrally located relative to the gold creeks surrounding them, which were also never more than a 10-20 miles away via pack and dog sled trails, which developed into a wagon road system in the 1920s. Tofty, likewise, was surrounded by gold-bearing creeks; even if a person chose to leave that area, the likely exit route was only ca. 9 miles by wagon road to the Tanana River, where regular steamers were available to transport away people and supplies (see Chapter 2, Historical Outlines). Local (i.e., intra-mining district) transport of goods also was not a serious problem for these three towns, as there were local horse teamsters or dog sled teams for rent or loan in all three of the mining communities. The last condition above, that is, implied ownership of a cabin and its material goods after "initial" abandonment, can also be demonstrated for the three mining communities in question. The strongest argument for such implied continued ownership of structure and associated material goods can be made for Coldfoot. Continued ownership of structures (and associated material goods) at Coldfoot is demonstrated next in order to show that curation of goods by owners occurred first, and was then later followed by scavenging of any remaining items.

Continued Ownership as an Indicator of Curation

Various forms of documentary, oral, environmental, and archaeological data are used to trace the vegetational history and ownership of structures in Coldfoot during its ca. 50 years of permanent and temporary occupation. In August 1899, a U.S. Geological Survey field crew traveled through the Upper Koyukuk only a few months after the first appreciable quantities of gold were discovered there, and reported trees as much as two feet in diameter and 80-100 feet in height along the lower 5-6 miles of Slate Creek.

(Schrader 1900). Photographs taken during this summer or early fall in 1899 or 1900 confirm a thick spruce forest initially covering this locale (Hegg 1902:10; Yukon Archives n.d.). Another photo taken inside Coldfoot in 1902 also shows an abundance of trees of appreciable size being used in cabin construction (George Lounsbury, personal collection). Two years later in 1904, an Alaska Road Commission crew reported about 80 structures in Coldfoot (Naske 1980:20-21). A photograph taken of Coldfoot the following year (1905) shows the Coldfoot town site completely denuded of trees, the result of the frenzied construction phase of Coldfoot's boom years (Stuck 1916). This same denuded condition is seen in a photograph of Coldfoot published three years later in 1908 (Anonymous 1908:90). We see in 1909, however, that trees were available ca. ¼ mile down stream from the Coldfoot town site (Maddren 1913: Plate VIII A). We also know that (see Chapter 2), during the next few years (ca. 1907-12) Wiseman would surpass Coldfoot as the economic, political, and population center of the Upper Koyukuk. All official federal positions and most commercial establishments had shifted to Wiseman by ca. 1911, thus prompting one observer to call Coldfoot essentially "dead" as he passed through in 1914 (Stuck 1916:47). This transition was accompanied by the removal of complete buildings between these two settlements, likely transported log-by-log in winter up the frozen Koyukuk via horse or even dog power.

Thus, Coldfoot's glory had come and gone in the span of a decade. Left behind were numerous standing structures (see additional references, below) and a town site denuded of trees. Wood remained the only realistic source of fuel for both heat and mining boilers in the area. As outlined below, the fact that numerous structures continued to stand at Coldfoot through the 1920s, when it was almost deserted, and when wood was at a premium, demonstrates that the structures (and any material goods inside) were still legally owned by Upper Koyukuk people living either in Wiseman or else on surrounding gold creeks. Otherwise, they would have been consumed as the closest available source of firewood by the site's few residents who continued to live in the town site through the 1920s. Curation, and likely "delayed curation" (where materials are removed by increment over an extended period of time; cf. Tomka 1993) is assumed to hold under these conditions.

As outlined in Chapter 2, James Minano and his growing family lived at Coldfoot between 1914 and ca. 1927. According to available data, the Minano family and the proprietors of Coldfoot's roadhouse and accompanying store were the town's only inhabitants through 1919-20 (Warbelow 1993; Newman 1978). About this time (1919-20), the roadhouse and store proprietors moved to Wiseman (U.S. Census 1920). Following this date, through ca. 1927, the Minano family and the Coldfoot school teacher, who apparently lived there between 1919 and 1923, were the only occupants of the site (Drane n.d.; Murie 1978:165; Warbelow 1993:43; Wiseman School District Letter File, in Brown 1988:342-44). Presently, there are no data to suggest that anybody else lived in Coldfoot during this time (1914-27), nor anybody between 1927 and the time when the next people occupied the site, sometime in the late 1940s or early 1950s (see below). This scenario is confirmed by excavated artifactual dating information (Chapter 2, "Archaeological Feature Chronology"), indicating that no artifacts in the excavated structures and other features definitely post-date 1930.

Upon their arrival in 1914, the Minano family "built" a two-room cabin, and later whipsawed a new floor for it (Warbelow 1992:44). A school house was "built" in Coldfoot in time for the beginning of the fall 1919 term, as Coldfoot during that time "was more centrally located for school children than was Wiseman" (Brown 1988:341-42; Bartlett n.d.: photo #72-156-237). And in 1921, a Wiseman community effort (by means of a "chopping bee") was necessary to stock up firewood for that winter's heating requirements for the Coldfoot school. There was also a raffle that year in Wiseman to raise money to deliver that wood to the school house, and to cut it to size for the stove (Webster 1921 in Brown 1988:344).

We know from documentary data that numerous structures continued to dot the Coldfoot town site during this time (ca. 1910-1927). Two photographs taken in late May 1920 illustrate the general lack of construction or fuel wood both inside the Coldfoot town site and on its opposite bank across the Koyukuk River (Bartlett n.d.: photos #72-156-236, #72-156-239). In 1924, visitors traveling through Coldfoot en route to Wiseman report "two rows of deserted cabins," stating that they stayed in the old roadhouse which had to be "unlocked" for them by the town's only inhabitants, the Minanos (Murie 1978:165). In addition, the last known historic photographs of Coldfoot come from a 1925 visit through the town (Drane n.d.). These photographs (Drane n.d.: #91-046-263, #91-046-264) illustrate not only woody vegetation returning to the Coldfoot town site and to the opposite side of the Koyukuk, but also show about 15-20 structures inside the old town.

All these data are significant because they demonstrate absentee ownership of many of Coldfoot's remaining standing structures: wooden structures that could just as easily have been utilized as habitations or as firewood, were not. Absentee ownership is demonstrated by combining a number of historical data, none of which individually indicate continued outside ownership of the numerous old Coldfoot structures in the decades following its near-total abandonment. Taken together, these data are: (1) "rows of cabins" and other structures remained in the town site after most people had moved away; (2) people continued to live in the town site to at least 1927, although they were very few in number; (3) there was a continued reliance upon wood as the only source of building material and fuel in the vicinity; (4) wood remained scarce inside the town site and the immediate locality until about the (late) 1920s; (5) new buildings were constructed in Coldfoot in 1914 and 1919 despite the presence of empty standing cabins in the town site; (6) at least some of the structures in Coldfoot remained "locked," implying ownership and an intention to continue such ownership; and (7) at least one instance of wood from an outside locale was brought into the town as winter fuel in 1921. In short, wood was a needed, valuable commodity by 1910-27 residents of Coldfoot for both shelter and heating, yet the closest obvious source of wood, that of extant old structures, was not utilized. This implies continued, legal, and recognized ownership of structures in the Coldfoot town site by people living outside of the settlement long after these structures were no longer continuously inhabited. We may also assume that ownership extended to any material goods remaining inside these structures. Based upon this reasoning, it is assumed that material goods inside those structures were likely curated by their owners, with this occurring over a protracted period of time. While it is possible that recurrent, episodic habitation of these structures may have occurred, and/or they may have been used as storage facilities, although this can not presently be demonstrated with currently available historical documentation.

Demonstrating Scavenging

Having demonstrated curation at Coldfoot, we next demonstrate scavenging, or at least the potential for scavenging at the old town site. All excavated foundations in Coldfoot (and Tofty and Wiseman for that matter) had been scavenged to one degree or another for their wooden structural elements. Oral sources (Will 1981; George Lounsbury personal communication 1996) inform us that at least three people inhabited Coldfoot sometime during the early-mid 1950s: Jim Murphy, an old miner, and Sammy and Ludie Hope, a native couple. Oral sources also confirm that it was these people that consumed for firewood most/all of Coldfoot's remaining standing or collapsing structures. This is consistent with historical sources that document the exodus of most people from the Upper Koyukuk during and immediately after World War II. It seems, therefore, that "absentee ownership" claims to remaining Coldfoot structures and material goods inside them left along with this exodus, for the remaining structures at the site were burnt up by Murphy and/or the Hopes. We may assume that these later inhabitants could burn up the unutilized structures because it was finally recognized that nobody owned/claimed them, whereas earlier inhabitants, such as the Minanos and the school teacher, could not.

This scenario corroborates available archaeological and environmental data. It was seen above (Chapter 2, Architectural Description) that in addition to all of the excavated foundations having had most of their wall and roof elements removed, four of the five excavated foundations also had most of their floor boards removed. In these four cases (i.e., foundations with scavenged floorboards), numerous nails were found protruding out of the tops of remaining *in situ* floor joists, indicating the floor boards were rotten and deteriorated when removed. This would be the case only if these foundations had been among those structures that remained standing after the town was largely abandoned. If our excavated structures had been among those that were dismantled and removed to Wiseman during the Coldfoot-to-Wiseman transition, the floor boards (at that time only a decade old) would have been taken up and moved to Wiseman, without nails being left behind projecting out of top of the floor joists. Floor boards are extremely labor-intensive or else costly to produce, and would not have been left behind. We may conclude, then, that the excavated foundations in Coldfoot were among those that had been left standing into the 1920s, likely were left into the 1940s and 1950s, and were among those burnt up by Coldfoot's last inhabitants.

Available environmental data also corroborate this scenario. Trees ring counts of the largest trees felled inside of the excavated foundations indicate that they started growing between the 1950s and 1970s. Other tree cores taken in 1997 inside what remains of the Coldfoot town site indicate the oldest trees as 88 years old, or that they began growing ca. 1909. These 88 year old trees, though, were few in number. Most other trees cored within the old town site dated ca. 60-70 years old, placing the onset of their growth to ca. 1925-35. These data accord with the historical documentation presented above, that of little tree growth inside the town site prior to the late 1920s.

The above oral, archaeological, historical, and environmental data support the scenario that the foundations excavated in Coldfoot in 1994 and 1995 survived into the 1940s or 1950s. If so, based upon these data and the reasoning presented above, we may assume that each structure sequentially underwent planned and gradual curation of usable items, and then subsequently underwent scavenging of any remaining *de facto* refuse. The specific time that either of these two processes (curation and scavenging) actually occurred for any of our excavated structures is really of no importance. They had all been scavenged for wood to one degree of another decades prior to excavation, thus providing at least at that time a thorough perusal of all contents both above and below the floor boards (excepting Coldfoot 5 in this last regard, since its floor remained intact). We may assume therefore that (1) all of our structures had undergone "permanent" abandonment (cf. Tomka 1993), and (2) that both curation and scavenging occurred with all of Coldfoot's excavated foundations.

Less historical research has been done with the two excavated foundations in Tofty and Wiseman. However, after assessing the historical outlines of these other two mining settlements (see Chapter 2), we may assume for present purposes that similar conditions (i.e., legal absentee ownership; prolonged curation or dclayed curation; eventual "permanent" abandonment; subsequent scavenging) prevailed at these two sites as well. In regards to Tofty, oral accounts supplied by miners who remember the Tofty town site prior to the 1969 fire specifically remember the excavated foundation as being partially scavenged for wood. And regarding Wiseman, the similarity of the excavated foundation to those excavated in Coldfoot, especially in terms of missing wall and ceiling elements and joists with nails protruding from *in situ* floor joists, lend credence to the assumed similarity of abandonment processes.

ABANDONMENT AT COLDFOOT, TOFTY, AND WISEMAN: A MODEL, A HYPOTHESIS, & ARCHAEOLOGICAL EXPECTATIONS

Figure 3.1 presents simplistic diagrams which models relationships among variables that affect material goods re-use at any archaeological site. "Re-use" here may refer to either curation or delayed curation activities by then-current residents, or any manner of later scavenging or looting. Figure 3.1 simply recognizes and illustrates that four main types of variables affect human decisions to re-use artifacts present at any location: time, space, natural environment, and socio-cultural context (Figure 3.1A). The complexity between these four basic types of variables and their influence upon artifactual

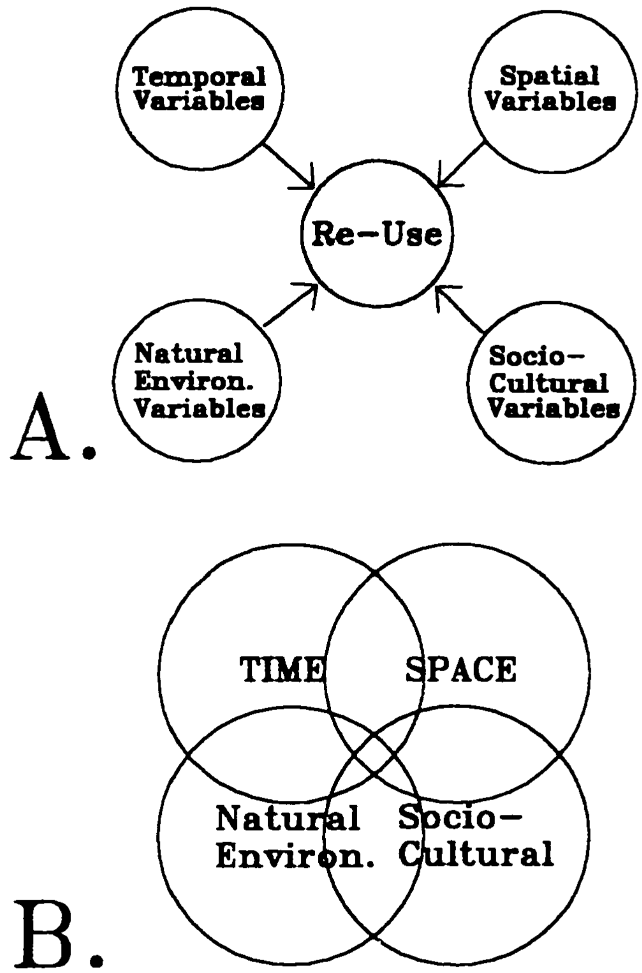


Figure 3.1 Interrelationships of variables that affect decisions regarding artifact re-use. The top figure (A) illustrates four main types of variables that affect human decisions regarding re-use of artifacts. The bottom figure (B) illustrates the complex, overlapping nature of these general variables that, in part, creates circumstances unique to different historical contexts.

"re-use" (curation, scavenging, collecting/looting) is illustrated in Figure 3.1B. This simple figure shows how variables common to many different times and places form unique conjunctions that affect distinct times and places differently. For example, an approaching forest fire is a "natural" variable affecting curation decisions within a settlement (represented by the "natural environment" circle in Figure 3.1B, not overlapping with the other three variables). A forest fire started by humans, however, combines both "natural" and "socio-cultural" variables, and is represented by the overlap between these two variables in Figure 3.1B. Also, the form of available transportation between any two settlements is a factor of all four variables: available technology is a function of time and socio-cultural variables, yet is also directly related to environmental factors present between two settlements, and the spatial distance involved. "Form of transportation," as such, is a multi-component variable that affects human decisions regarding the curation and/or scavenging of material goods within and between different sites, and is represented by the central overlapping portion of Figure 3.1B where all four variables overlap.

Following this simple model, a hypothesis pertinent to the three early twentieth century mining sites is presented. The hypothesis is a derived from generalizations reviewed in available abandonment literature, but necessarily focuses on settlements and structures which have undergone a high degree of curation and/or scavenging, such as was demonstrated above for Coldfoot, Tofty, and Wiseman. The hypothesis is as follows: *The exact extent of curation and scavenging in a structure or settlement is related to a variety of single and multi-component variables (see Figure 3.1). These variables include, but are not limited to: (1) the ease of replacing certain types of artifacts in a particular setting, which is in turn related to freighting costs into a settlement/site; (2) the time of occupation of a structure within a settlement's duration, or the timing of a settlement within a region; (3) the past physical condition(s) or integrity of a structure or settlement, and any changes in such conditions through time (e.g., a standing structure versus one torn down); and (3) accessibility of a structure or settlement, whether to* *people within the settlement or to those from outside.* Differences in the historical context of these and other variables at different sites lead to discrepancies noted in artifactual assemblages.

Based upon specific historical data from the Coldfoot, Tofty, and Wiseman mining settlements, nine archaeological expectations are formulated which are testable against archaeological data. Their specific formulations are explained in the next section, following the outline of the nine expectations, below. Again, the following expectations are written for the contextual and behavioral conditions undergone by Coldfoot, Tofty, and Wiseman; more specifically, where a prolonged and gradual abandonment resulting in a high degree of curation and scavenging can be demonstrated. Specific expectations may require further demonstrated abandonment conditions (e.g., timing of abandonment; scavenging of floorboards). As such, the expectation outlined below are applicable to other archaeological sites only if similar conditions can be demonstrated at those sites.

Artifact Condition: Remnant Use-Life, and *De Facto* Refuse Size

Evaluation of Expectation #1: Artifact assemblages in heavily curated and scavenged features and sites will be dominated by non-functional (i.e., no "remnant use-life") abandonment and secondary refuse, relative to usable *de facto* refuse.

Expectation #2: Any *de facto* refuse that is present inside of excavated foundations will be dominated by "smaller" items and relatively few (if any) "larger" items ("small" and "large" being arbitrarily defined, and explained below).

Artifact Condition Through Time

Expectation #3. Relative numbers of usable artifacts in structural foundations should be fewer in earlier-abandoned structures, and greater in later-abandoned structures. That is, percentage of usable artifacts will increase later (i.e., more recent) the date of abandonment of a structure.

Expectation #4: Later-occupied structures in a settlement not only have less potential for being scavenged, but their occupants also had the opportunity to scavenge from other abandoned structures in the settlement (as well as from any nearby settlements), and to "enrich" their material inventories through "hoarding" activities. Such "hoarding," if visible archaeologically, should therefore be observed in later-occupied structures.

Expectation #5: The longer that buildings are left wholly or partially standing, the higher their scavengeability potential, and the increased potential they have to accumulate primary and secondary refuse. This may occur either owing to intentional use as a secondary refuse receptacle, or through (repeated) use as temporary short-term shelters in which maintenance activities are largely suspended.

Assemblage Spatial Considerations

Expectation #6: Subterranean cold storage cellars or boxes will receive a disproportionate amount of refuse relative to their overall size (whether via cultural or natural means, or both).

Expectation #7: In structures undergoing gradual and planned abandonment, resulting refuse deposited on the floor will form clusters as maintenance and routine clean-up activities cease. Such patterns should be evident on intact floor surfaces.

Expectation #8: During structural and floor dismantling, refuse (especially "larger" refuse) will tend to congregate away from the central areas of rooms and alongside the walls.

Expectation #9: There is a greater possibility of larger accumulations of refuse on remaining intact and *in situ* sections of dismantled floors relative to those areas where floor boards have been removed, especially if such floor sections are not centrally located inside a foundation.

FORMULATION OF THE ARCHAEOLOGICAL EXPECTATIONS

This section reviews pertinent archaeological abandonment literature used in deriving the nine archaeological expectations, presented above. As indicated, the nine expectations are presented in three broader categories of discussion. The specific expectations in each category are repeated prior to the beginning of each section.

Artifact Condition: Remnant Use-Life, and De Facto Refuse Size

Expectation #1: Artifact assemblages in heavily curated and scavenged features and sites will be dominated by non-functional (i.e., no "remnant use-life") abandonment and secondary refuse, relative to usable *de facto* refuse.

Expectation #2: Any *de facto* refuse that <u>is</u> present inside of excavated foundations will be dominated by “smaller” items and relatively few (if any) “larger” items (“small” and “large” being arbitrarily defined).

In his Index of Curate Priority, Schiffer (1985) outlines conditions or attributes of artifacts that influence whether the artifacts will be curated from one site to another by a site’s occupants. Four factors influence whether or not any specific artifact is curated: its weight, its size, its replacement cost, and whether it has any remnant use-life (Schiffer 1985:31). While it is not necessary to present in detail Schiffer’s quantification scheme, an artifact essentially has a higher curation potential the less weight it has, the smaller it is, the higher replacement cost it has, and the more remaining use-life it contains. An artifact with all these qualities has a very high curation potential, and likely will be removed from a site regardless of type of abandonment (i.e., permanent; episodic; cyclical).

Specifically regarding "remnant use-life," the greater the remaining use-life (i.e., usability) of an artifact, the greater is its potential to be curated (Schiffer 1985:33-34). Use-life involves two attributes, completeness and degree of wear (see also Schiffer 1983:681-684), and Schiffer creates four categories of "use-life" by combining these two attributes, scaling them from highest to lowest in curate potential: intact and no wear, intact and slight-moderate wear, intact and heavy wear, and broken or totally worn out (i.e., non-functional). Those items with highest curate potential would also make them attractive to scavengers and collectors (Schiffer 1985:35). Regarding his Index of Curate Priority, Schiffer is explicit about its relevance to site explanation potential when he states that it (the index) is "applicable to settlements where transport constrained the kinds and quantities of items that could be curated" (Schiffer 1985:31; emphasis added). However, in the interior Alaskan mining settlements examined in this study, there were no serious intra-settlement transport constraints, nor were there inter-settlement transport constraints within a single mining district. Anyone could own, rent or borrow a horse or dog team and wagon/sled and move large loads, including entire log structures if needed. Under such transportation circumstances, "portability" of an object, as reflected in its size and weight, are no longer variables that affect curation decisions. In such cases, replacement cost and remnant use-life gain increased influence over determining the characteristics of remaining, non-curated *de facto* refuse. These variables influence curation, as well as subsequent scavenging and collecting. Expectation #1, then, specifically focuses upon one of these two remaining influential variables of curation, that of remnant use-life of an artifact.

Stevenson (1982) demonstrated the contrast between different artifact assemblages that were formed under different abandonment scenarios. Stevenson, studying turn-of-the-twentieth century Yukon Territory mining settlements, contrasted towns that had been abandoned under gradual and planned conditions with no intention to return, against those that had been abandoned under hasty conditions with full intention of return, but where later return had not taken place. Stevenson quantified for each site the different relative quantities of *de facto*, primary, and secondary refuse, along with their spatial arrangements inside the settlements and inside of each settlement's structures. He found that sites abandoned under orderly, gradual conditions with no intention of return had much less *de facto* refuse relative to those sites abandoned suddenly and where return was anticipated. Since the excavated structures at Coldfoot, Tofty, and Wiseman were also abandoned under gradual, planned conditions, Expectation #1 assumes relatively little *de facto* refuse in the foundations's excavated artifactual assemblages.

Various researchers have also commented upon assemblage artifact size as a variable reflective of certain formation processes (Expectation #2). For instance, primary refuse in maintained activity areas consists of predominantly small artifacts, left intentionally or unintentionally after clean-up. Larger refuse, whether potentially usable or not, tends to be either tossed or removed some distance away (e.g., "toss zones," Binford 1983:144-192; "toft areas," Hayden and Cannon 1983:126), or else deposited in a secondary refuse area. In areas, or times, when maintenance activities are lax, larger artifacts may be left *in situ* (Stevenson 1982). Also, easily replaceable large objects are more apt to be deposited as *de facto* refuse during abandonment than smaller items (Lange and Rydberg 1972).

Schiffer again was among the first to systematically address size of artifacts in a quantifiable manner (e.g., 1985; see also Rathje 1979). Along with weight, remnant use-life, and replacement cost, size is a variable that influences curation choice. In short, the smaller an item is the more likely it is to be curated to another site (Schiffer 1985:33-34). However, as stated above, size is related to curation decision-making only where available transportation constrains the movement of goods. This was *not* the case within the turn-of-the-century mining sites examined here, or even *within* their mining districts. However, "loss" may still prevent the curation of even the most prized small artifacts. Schiffer (1976:32-33) proposes two principles relating to loss, all things being equal: (1) loss is indirectly related to mass, and (2) loss is directly related to portability or transportability. As mass is often, though not invariably, related to size, these principles indicate that small, light and easily portable objects tend to be lost or overlooked more frequently than larger, heavier, more stationary objects. Thus, as presented in Expectation #2, those usable, *de facto* refuse that remain in an archaeological site under planned, gradual abandonment conditions tends to be "small" rather than "large," as larger usable items were less likely to be overlooked during curation and scavenging.

One other study that examines artifact size as a reflection of abandonment processes is Brooks (1993), who quantifies artifact size as one of his Floor Correspondence Measures. Brooks's study examines excavated houses from the Southern Plains dating to late prehistoric times. Size of artifacts, along with architectural measures, refitting, and spatial distribution analysis in his study, is used to assess planned versus unplanned abandonment of structures. While emphasizing that no one variable alone is indicative of past type of abandonment, Brooks correlates relatively high percentages of large items on habitation floors with unplanned abandonment, and lower percentages or large items with planned abandonment (Brooks 1993:185). This conforms to our Expectation #2, that of expecting relatively low numbers of "large" items in structures undergoing planned, gradual abandonment.

Interestingly, Brooks makes this assertion "because larger items usually have considerable energy investment," and thus larger items have more replacement cost built into them which makes them probable items for curation (see Schiffer's Index of Curate Priority, above). While this makes sense in the case of Brooks's handmade prehistoric materials, it makes less sense with mass-produced early twentieth century material culture, as found in our mining sites's artifact assemblages. With such mass-produced material goods, it is unjustifiable to equate increased artifact size with increased cost (and thus replacement cost), as cost of such mass-produced goods is typically equated *less* with physical size and *more* with value of raw materials, value of time (in terms of both expended skilled and unskilled labor), and value of transporting cost to the consumer.

However, Brooks's equation of higher energy investment with larger items might still be applicable to mass-produced material goods if viewed from the perspective of higher future energy potential. That is, in isolated locales, where transportation is not constrained within a settlement or between closely located settlements, but where importing transportation costs are at a premium, I propose that larger items, whether directly usable or not, will be preferentially curated and scavenged over small items owing to their future potential reserve value. Large sections of used sheet metal, rubber, and leather, for example, while potentially no longer usable for their initial functions, still have higher potential material reserve value as raw materials than smaller items. This, too, conforms to Expectation #2.

Artifact Condition Through Time

Expectation #3. Relative numbers of usable artifacts in structural foundations should be fewer in earlier-abandoned structures, and greater in later-abandoned structures. That is, percentage of usable artifacts will increase later (i.e., more recent) the date of abandonment of a structure.

Expectation #4: Later-occupied structures in a settlement not only have less potential for being scavenged, but their occupants also had the opportunity to scavenge from other abandoned structures in the settlement (as well as from any nearby settlements), and to "enrich" their material inventories through "hoarding" activities. Such "hoarding," if visible archaeologically, should therefore be observed in later-occupied structures.

Expectation #5: The longer that buildings are left wholly or partially standing, the higher their scavengeability potential, and the increased potential they have to accumulate primary and secondary refuse. This may occur either owing to intentional use as a secondary refuse receptacle, or through (repeated) use as temporary short-term shelters in which maintenance activities are largely suspended.

Several archaeologists indicate that it is possible to quantify an artifact assemblage's overall "condition" as a reflection of temporal stage of abandonment. For example, as part of his research on Bolivian agro-pastoralists, Tomka (1993:15-23) classified individual artifacts at several sites, under different temporal stages of abandonment, into one of three broad artifact classes: "good" (functional; lacking use-damage), "worn" (still functional; exhibits use-damage or repair; includes exhausted items), and "broken" (non-functional). Tomka examines, in part, how time affects episodically abandoned assemblages, as people return again and again to retrieve useful items from a structure's material contents. In summary, with the passage of time, such "delayed curation" (1) continuously reduces the overall number of items in an assemblage, and (2) reduces the percentage of "good" items in an assemblage through time, relative to "broken" items, which concomitantly increases in relative percentage through time. Tomka recognizes that continued artifact <u>scavenging</u> over time would have the same observed effect, that is, continuing to decrease overall artifact number through time, as well as decreasing the percent of usable, functional items (Tomka 1993:16).

Using a technique devised earlier by Reid (1973), Montgomery (1993) provides a relative dating sequence of intra-site abandonment of rooms at a southwestern U.S. Pueblo site. She evaluates numbers of complete pots on the floor of a room (i.e., usable, *de facto* refuse) relative to the number of sherd fragments on the floor and in the fill above the floor (i.e., primary refuse, secondary refuse, and abandonment refuse). In order for this Relative Room Abandonment Measure to be used, four processes are assumed to have occurred at the sites during and following abandonment (Montgomery 1993:158): (1) when a habitation room is abandoned but the pueblo is still occupied, usable objects will be curated to another room; (2) scavenging of curatable objects by others will likely occur if not originally curated or retained by the original occupants; (3) abandoned habitation rooms will be used for secondary refuse disposal; (4) the last habitation rooms occupied will not be used as dumps.

The first and second of Montgomery's assumptions are applicable to the three Alaska mining settlements studied here, that is, curation and subsequent scavenging of artifacts left in planned and gradually abandoned structures. The third and fourth assumptions are more problematic to assign to the three Alaskan mining settlements. The foundations at Coldfoot (and Tofty and Wiseman for that matter) are distributed much further apart than are Montgomery's Puebloan room blocks, and thus may not have been viewed as potential secondary refuse disposal sites as readily as the wall-to-wall Puebloan housing. However, as a general rule, we may assume that if the mining settlements's abandoned structures were not re-occupied by later site occupants (as appears to be the case; see Curation and Scavenging, above), they would overall accumulate over time more primary and secondary refuse owing to a easing or cessation of maintenance activities.

Based upon Montgomery's (1993) "complete pot versus fragmentary pot" scoring, four ratios are possible for an artifact assemblage in any of her excavated Puebloan features (Montgomery 1993:157-158): Group A (Low numbers of complete floor pots and Low numbers of fill sherds), Group B (High-Low), Group C (Low-High), and Group D (High-High). Whereas Montgomery provides Puebloan context-specific explanations for Groups A and D, Group B (High numbers complete-Low numbers fragmentary) and Group C (Low numbers complete-High numbers fragmentary) are interpreted more broadly, and are useful in providing abandonment-related explanation beyond the specific confines of the prehistoric Southwest Puebloan context. Rooms exhibiting a Group C ratio (Low numbers complete-High numbers fragmentary) are recognized as earlier occupied rooms, reflecting low numbers of curatable complete pots (i.e., *de facto* refuse) relative to high amounts of trash resulting from re-use of the feature as a secondary refuse disposal feature. Group B-like rooms (High numbers complete-Low numbers fragmentary) are seen as later-abandoned rooms, containing higher numbers of *de facto* refuse relative to other forms of refuse.

Expectation #3 anticipates that earlier structures inhabited (or otherwise utilized) and abandoned in a settlement will have more curatorial and scavengeability potential than later-occupied structures. This should be reflected in terms of different percentages of usable, *de facto* refuse in different structures. Earlier-occupied and abandoned structures should have lower percentages of usable artifacts in their assemblages. Later-occupied and abandoned structures shoulder have higher percentages. This reasoning is particularly appropriate to Coldfoot because the excavated structures date to different times (see Chapter 2, Archaeological Feature Chronology), but all stood to about the same time when they were burned up as firewood (ca. early-mid 1950s). Expectation #4 specifically addresses the potential for later-abandoned structures to contain "hoarded" materials that were curated or scavenged from earlier-occupied structures in a settlement. Expectation #5 specifically refers to the presence of higher percentages of non-usable refuse in standing structures. Since two excavated structures in our study can be demonstrated to have remained standing longer than the others (Coldfoot 5, Tofty 1), attention is drawn to their artifact assemblages percentages of usable and non-usable refuse relative to other excavated features.

Assemblage Spatial Considerations

Expectation #6: Subterranean cold storage cellars or boxes will receive a disproportionate amount of refuse relative to their overall size (whether via cultural or natural means, or both).

Expectation #7: In structures undergoing gradual and planned abandonment, resulting refuse deposited on the floor will form clusters as maintenance and routine clean-up activities cease. Such patterns should be evident on intact floor surfaces.

Expectation #8: During structural and floor dismantling, refuse (especially "larger" refuse) will tend to congregate away from the central areas of rooms and alongside the walls.

Expectation #9: There is a greater possibility of larger accumulations of refuse on remaining intact and *in situ* sections of dismantled floors relative to those areas where floor boards have been removed, especially if such floor sections are not centrally located inside a foundation.

The first spatial expectation (#6) derives from Montgomery's (1993) assumptions regarding the sequential abandonment of prehistoric Puebloan features in the American Southwest, as discussed above. One of the assumptions of her study is that earlier-abandoned habitation rooms will be used for secondary refuse disposal by later site residents (Montgomery 1993:158). This assertion is based in large part upon archaeological data from other Puebloan sites. Such abandoned rooms/features were used as secondary refuse receptacles owing to their known abandoned condition, along with their close proximity to current residences. That is, Montgomery's Puebloan rooms were built side-by-side, sharing intervening walls.

I will extrapolate from Montgomery's assumption regarding Puebloan rooms, to the subterranean storage facilities found in excavated structures in Coldfoot, Tofty, and Wiseman. Five of the excavated structures from Coldfoot, Tofty, and Wiseman had subterranean cold cellars or boxes. Four of these were excavated along with their foundations: Coldfoot 1, Coldfoot 4, Coldfoot 14, and Tofty 1 (see Chapter 2, Architectural Details). Wiseman 1 also had a very large (ca. 4.5 x 5 m) cellar, but it was not excavated because it contained an accumulation of potentially hazardous material. As this unexcavated cellar indicates, however, such cultural pits often become receptacles of refuse when maintenance or "clean-up" processes are reduced during and following abandonment. Such holes would naturally be used as secondary refuse receptacles during curation and subsequent scavenging episodes, or as caching locations. Therefore, Expectation #6 anticipates greater than expected amounts of refuse inside of these storage boxes or cellars relative to their size, owing to intentional cultural deposition.

On the other hand, depressions, whether of natural or cultural origin, may act as "natural" accumulators of deposits as a result of downward erosion from higher surrounding areas. With respect to the excavated cellars or boxes in this study, however, I believe such post-depositional movement was minimal. Most of the excavated storage boxes or cellars lacked any surrounding sloping ground which could "feed" into them by natural erosional processes. Excepting one of the excavated foundations, Coldfoot 14, the other excavated storage units in this study were all subterranean rectangular boxes set into an otherwise roughly level surface. Coldfoot Feature 14's storage unit, on the other hand, was a large cellar situated underneath ca. ¼ of the foundation, ca. 3 x 3 m and 1.08 m in depth (see Chapter 2, Architectural Details). Excavation of Coldfoot 14 revealed that materials from inside the foundation may have entered this large cellar from the area immediately to the north of the cellar, owing to erosion (see Appendix B, Figure B.6). However, the eastern side of the cellar exhibited no indication of matrix erosion into the cellar from the surrounding foundation, and the southern and western sides of the cellar aligned with the southwestern corner sill logs, thus no materials from inside of the foundation could enter from these directions. Adding to this the fact that relatively few artifacts were found in the fill above the collapsed floor of the Coldfoot 14 cold cellar, I believe that the number of artifacts in the cellar resulting from post-depositional erosion from the surrounding Coldfoot 14 foundation is minimal.

I turn next to the spatial patterning from within the boundaries of the excavated foundations. Studies specifically focusing upon the relationship between abandonment and spatial patterning of *de facto* refuse in habitation sites are few. For example, in Brooks's (1993) prehistoric Plains Village study, unplanned abandonment is correlated with a concentration of artifacts against walls, under benches, or around internal support posts (1993:183). Stevenson's (1982) study of early twentieth century mining in the Yukon Territory found that clustered arrangements of refuse occurred on the floors of cabins owing to planned, gradual abandonment, with no intention of returning to the site. This came about owing to a cessation of routine maintenance activities (1982:246-252). Finally, Hayden and Cannon (1983:131-139) examine the spatial distribution of "provisionally discarded" refuse (i.e., items that contain possible future use-life), which are stored in distinct locations both inside and outside of habitation structures. Outside of structures, provisionally discarded materials are intentionally stored and accumulate away from normal activity areas, typically in out-of-the-way places such as alongside walls or fences. On the inside of structures, provisionally discarded items tend to concentrate in out-of-the-way places such as under or behind furniture or storage containers, or in corners, where they may remain for many years away from the "dispersive, attritional, or randomizing processes" more typical of outdoor settings. Upon abandonment, provisionally discarded items are often left behind and are not curated, as they are by definition the least-valuable and most easily replaced items in the household. Based upon this information, we expect that inside of those structures abandoned under planned, gradual conditions, refuse on the floor will in general tend to be clustered, notably against walls or underneath site furniture (Expectation #7).

While all three of these studies (Brooks 1993; Hayden and Cannon 1983; Stevenson 1982) provide further discussions about the clustering or non-clustering of artifacts in relation to known abandonment conditions, they are directly applicable to only a single excavated foundation in the present study (Coldfoot 5). This is because of an implicit variable held constant in Brooks's, Stevensons's, and Hayden and Cannon's ethnoarchaeological and archaeological studies: the floor surfaces or walking surfaces remain intact. In the present study, however, five of the six excavated foundations from Coldfoot and Wiseman had most or all of their wooden floor boards dismantled and removed by later scavengers for firewood (see Chapter 2, Architectural Details). Also, the floor the Tofty 1 foundation is largely missing, owing to scavenging and/or fire destruction. Obviously, removal of floor boards which originally served as the depositional surface for all secondary, primary, or *de facto* refuse, will have dramatic effects on the spatial arrangements of any artifacts lying upon them. In only one case in his Yukon mining settlement study does Stevenson (1982:260) note the removal of floorboards from an abandoned cabin which, interestingly, was the only cabin in his study which did not conform to statistical expectations of quantity and spatial distribution of artifactual remains. He notes the wooden floor's removal in this case as the probable reason for the statistical discrepancy. While floor removal obviously precludes a direct comparison between most of the excavated foundations from Coldfoot, Tofty, and Wiseman with the expectations based upon available abandonment literature, it still provides an opportunity to examine spatial data resulting from this largely unexplored abandonment variable (i.e., floor board scavenging).

The following discussion reviews the basis for Expectations #8 and #9, which examine the size and spatial arrangement of most artifacts in structures which have undergone intentional removal of their floor boards in the past. Essentially, any spatial analysis of artifacts from inside of structures which have had their floor boards removed will likely not provide information related to curation and scavenging behavior which occurred prior to the floor's removal. Spatial patterns evident in the data, on the other hand, are likely to be the result of (1) loss or primary refuse that fell through cracks in the floor boards, (2) refuse disposal that came after structural and floor board removal (i.e., intentional use of the abandoned structure as a secondary refuse receptacle; c.f., Montgomery 1993), and/or (3) patterns that derived from the actual process of structural and floor dismantling. These three processes will be briefly discussed next, to assess each one's potential contribution for creating the spatial patterns of artifacts in Coldfoot, Tofty, and Wiseman.

In regard to the first process mentioned above (i.e., patterns produced by primary refuse or loss), there is no doubt that loss occurred in several if not all of the foundations. This is evident by the presence of items such as coins which surely would have been removed if seen. However, the question remains whether such loss occurred during the original occupation, or during subsequent dismantling. Such distinctions are indeterminable. Also, spatial distribution of such small items may indicate past "activity areas," where some of the small objects or refuse from such activities fell through cracks in floor boards. However, even when such clusters of items are apparent (e.g., concentrations of seed beads in Coldfoot 1 and Coldfoot 14), we are left to wonder whether these concentrations result from primary refuse deriving from initial occupation, or result from a spilling and scattering of unwanted *de facto* refuse by later scavengers. Without recourse to temporally-relevant stratigraphic separation, we are forced to treat the deposits as single analytical entities.

While there is no way to entirely dismiss the second process above (i.e., spatial patterns in our excavated foundations formed by primary or secondary refuse deposited after a floor's removal), it is unlikely that such refuse forms much of the excavated foundations's artifactual assemblages. If a structure's floor was removed, then it is likely also that its walls and roof were removed also, by either earlier people who might have removed a structure to a new locale, or by later firewood scavengers. After the removal of a structure down to its base foundation sill logs and joists, an location of an old foundation will no longer attract the attention of refuse disposers than any other part of the site. Unlike Montgomery's (1993) prehistoric Puebloan example, the Coldfoot, Tofty, and Wiseman foundations are not in direct spatial proximity to any other foundation. That is, they are not readily available and bounded new receptacles for trash located immediately adjacent to contemporary habitations. In addition, other factors at Coldfoot, Tofty, and Wiseman likely precluded the deposition of secondary refuse inside of structural foundations after they have been scavenged for their structural elements and floor boards: (1) natural seasonal ravines, streams, and/or rivers traverse through and alongside the settlements, serving as more attractive secondary refuse disposal areas; (2) many of the foundations at these sites had associated refuse pits or scatters next to them, which, along with (3) the preponderance of sheet refuse noted throughout all three mining sites, indicates that people were not adverse to depositing refuse in the immediate vicinity of their habitations. In short, there is no indication that people deposited refuse in dismantled structures, nor even in empty abandoned structures still standing.

Without recourse to alternative processes, the likely cause of any spatial arrangements of refuse inside of most of the excavated foundations would be final act of structural dismantling and floor boards removal, or the third process indicated above. The following discussion forms the basis of Expectations #8 and #9.

What happens to artifacts inside a log structure when it is dismantled and its floor boards ripped up? I have neither witnessed such a process, nor am I aware of any studies that outline such activities. Turning to intuition, I speculate that two possible "tearing-down-a-log-structure" scenarios may occur: (1) dismantling and removing most or all of a structure at one time, or (2) a gradual dismantling of a structure over an extended period of time. What would be the effect upon material refuse in structures undergoing these two possible dismantling scenarios? "Larger" artifacts would likely need to be removed from the immediate area of dismantling as a form of "hindrance avoidance," that is, removing items from interfering with the dismantling task, or as a safety issue of keeping items out from underfoot. If a floor was removed all at once, it makes intuitive sense to either discard larger items outside of the foundation, or else place or otherwise pile up items alongside the walls or sill logs, in order to keep items out of the way for the duration of the dismantling work. While transfer of items to the outside of a foundation requires purposeful intention on the part of the dismantlers, items ending up alongside the inner walls or sill logs might end up there either intentionally or unintentionally. While this is purely speculative and needs to be confirmed via ethnographic observation, one can envision items, especially "larger" items, shifting away from the center of the room with its more intensive foot travel and congregating towards and alongside the foundation sill logs. This situation is enhanced when one takes into account the berms of earth that parallel behind the sill logs of all excavated foundations (see Chapter 2, Architectural Details). Such berms, sometimes several feet high and piled up along the outer walls of the foundations for insulation purposes, are still evident in standing cabins in Wiseman today, and in historical photographs of cabins throughout Alaska. In this scenario, such berms further act as a barrier to prevent items from leaving the foundation and concentrating them alongside the sill logs. If on the other hand, a floor were removed over an *extended* period of time, then in addition to these two possibilities (items intentionally removed from foundation, and items congregating along sill logs), objects might also simply be placed or piled up temporarily on a section of the floor not presently being dismantled, preferably out of the way of foot travel in some peripheral location and not in the center of the foundation.

Expectations #8 and #9 derive from the above discussion. Expectation #8 predicts that during structural dismantling, refuse (especially "larger" refuse) tend to collect away from the central areas of rooms and alongside the foundation walls or sill logs. Expectation #9 predicts that there is an enhanced possibility of larger accumulations of refuse on remaining sections of partially dismantled floors, relative to those areas where floor boards have been removed, especially if such refuse are not centrally located. Again, these two expectations are "common sense" constructs, and are *not* based upon ethnographic, historical, or ethnoarchaeological data.

EVALUATION OF THE ARCHAEOLOGICAL ABANDONMENT EXPECTATIONS

A simple figure illustrating the multi-component nature of relationships between variables (temporal, spatial, socio-cultural, natural) that affect artifactual re-use at sites was presented (Figure 3.1). Based largely upon published abandonment research, a hypothesis was next presented which listed specific multi-component variables that affect curation and scavenging activities at sites having undergone gradual and planned abandonment (e.g., Coldfoot, Tofty, and Wiseman). In order to evaluate this hypothesis, nine expectations were formulated which fall into three broader categories, relating to (1) artifactual condition (e.g., usability; size), (2) changing assemblage condition through time, and (3) spatial arrangements of refuse inside of strucutral foundations. These expectations, while based largely on published abandonment literature, were specifically formulated because of known historical conditions and abandonment processes at the three mining settlements. Presented sequentially, these nine expectations are evaluated below against archaeological data derived from the three Alaskan mining settlements. Specific methods and techniques are presented prior to each evaluative analysis, when necessary.

Artifact Condition: Remnant Use-Life, and *De Facto* Refuse Size

Methods for Evaluating Expectation #1

Expectation #1, again, predicts that artifact assemblages in heavily curated and scavenged features and sites will be dominated by non-functional (i.e., no "remnant use-life") abandonment and secondary refuse, relative to usable *de facto* refuse. Three issues relating to the methods used in evaluating Expectation #1 are discussed next, prior to the specific evaluation exercise: (1) Scoring for "completeness" and "usability" as an indicator of remnant use-life; (2) excluding certain types of artifacts from the completeness and usability scoring; and (3) distinguishing separate analytical units within some of the excavated foundations.

Methods for Evaluating Expectation #1: Scoring for "Completeness" and "Usability"

Schiffer (1985:33-34) manipulated two artifact attributes, "completeness" and "degree of wear," to create four categories of artifact classes relating to artifact remnant use-life: (1) intact and no-wear, (2) intact and slight-moderate wear, (3) intact and heavy wear, and (4) broken or totally worn out. Similarly, Tomka (1993:15-23) creates three artifact classes based upon two attributes, "functionality" and "degree of wear": (1) good (functional, lacking use wear), (2) worn (functional, though exhibiting use wear or repairs), and (3) broken (fragmentary and/or non-functional). While it is recognized that these researchers use the attribute "degree of wear" as a proxy measure on remaining use-life (i.e., heavier wear, less use-life), its use with mass-manufactured twentieth-century material goods is found too subjective for this present study.

Issues of subjectivity caused by different observers or "scorers" of artifact attributes make comparisons between different research projects speculative. Also, as many artifacts from twentieth century sites are made of metals which are more resistant to wear and breakage than either prehistoric materials or metals from earlier centuries, comparisons between different time periods and assemblages of different overall material types is also speculative. Therefore, Schiffer and Tomka's remaing two attributes of artifact remnant use-life, "completeness" and "functionality," were used in this study. All artifacts excavated from Coldfoot, Tofty, and Wiseman were scored accordingly: is the artifact complete (yes or no)? and is the artifact still functional or usable (yes or no)?, regardless of degree of wear. As some artifacts were re-used for different functions, functionality or usability here refers to an artifact's last apparent function.

Four classes of artifacts are defined in this study: (1) complete and usable, (2) complete and non-usable, (3) fragmentary and usable, and (4) fragmentary and non-usable. Scoring for "completeness" was straightforward. "Completeness" describes any specimen that is not broken and/or is not in fragmentary condition. As most of the artifacts recovered were either recognizable to myself or to informants, it was easy to determine whether an item was complete or not. "Usable" or functional refers to whether an item is (or was, when deposited) useful for its last intended purpose. However, a "complete" artifact does not always equate with its being usable or functional. Several groups of artifacts fall within this second "complete and non-usable" artifact class. These include "exhausted" items (e.g., toothpaste tubes; most intact tin canisters; tobacco plug stamps; pits and seeds from fruit; very worn-out boots and shoes; bottle caps and corks; etc.), as well as a variety of (mostly) metal parts from "composite" material goods. Examples of this latter "composite" group include gears, bodies, and bases for a host of mechanized artifacts (e.g., clocks; music boxes), wick adjusters for kerosene lamps, blades from folding pocketknives, etc. A third group of items in the "complete and non-usable" artifact class include lone rivet-type buttons, solitary halves of clothing snaps, iron circular or D-shaped keep rings, solitary parts of suspender or belt buckles, clothing rivets, and boot grommets.

As opposed to the "exhausted" group of items, many of the other types of "complete and non-usable" artifacts just mentioned are items that could potentially be used again at some future time for an unspecified purpose, and thus may be regarded as "provisionally discarded" items that were ultimately left behind upon abandonment (c.f., Hayden and Cannon 1983:131-139). The fact that they are presently not usable by themselves makes them technically "not useful" for present analytical purposes. For example, a belt buckle is not useful by itself, but could be if brought together with other items. Many of these items, however, may also be secondary refuse of broken and discarded items. For example, a broken alarm clock abandoned in a structure may undergo later destruction and scattering into its many separate components, none of which themselves are actually "fragmented." In such cases it might be impossible to determine whether the clock parts were intentionally kept for possible future use, or simply represent secondary refuse. On the other hand, some items likely *were* provisionally kept. Spatial clusters of centerfire cartridges and primers, clothing rivet-buttons, or sliced off boot grommets indicate a collecting, retention, and later discard sequence of behavior. Context, both spatial and associational, is therefore necessary for assessing abandonment-related behavior of some materials, especially those presently labeled as "complete and non-usable."

Figures 3.2-3.5 plot the varying percentages of each of Coldfoot, Wiseman, and Tofty's excavated features's assemblages in terms of these two attributes, "completeness" and "usability." These figures display three classes of artifacts: "usable" (i.e., all *de facto* refuse, adding together both complete and fragmentary usable items), "complete and non-usable" items, and "fragmentary and non-usable" items. The figures thus display relative percentages of "usable" *de facto* refuse in an assemblage, relative to both possible "provisionally discarded" items ("complete and non-usable") and to completely broken or fragmentary items. All excavated features are included for comparative purposes, including foundations, trash pits, and the privy hole. Coldfoot features are represented by numbers corresponding to feature number, Tofty 1 is labeled "T.1," and Wiseman 1 is labeled "W.1." All features are color coded as to feature type.

Methods for Evaluating Expectation #1: Excluding Certain Types of Artifacts from the "Completeness" and "Usability" Scoring

Excluding Nails: Figures 3.2-3.5 exclude certain types of artifacts from consideration. Specifically, these figures exclude both construction nails (overwhelmingly wire nails) and window glass, but for different reasons. Too many unknowns surround the perception of wire nails to feel secure in scoring them according to "usability." Re-use of nails, whether bent or unbent, depends upon the user, and most importantly upon the availability and replacement cost of new nails. Nails in general were affordable in America by the early-mid nineteenth century, and inexpensive, strong, plentiful wire nails were abundant by the early twentieth century (Loveday 1983). Regardless, transport expense was the major concern to the Upper Koyukuk population (i.e., Coldfoot, Wiseman), <u>not</u> actual supply availability. If one could afford it, one could probably obtain most anything desired or needed, although the cost might well be prohibitive. On the other hand, while wire nails are certainly "heavy," they are compact, do not break during shipment, and arrive in large quantities per unit volume, and thus likely lessened their shipment cost relative to other types of imports. Since wire nails in the excavated structural foundations constituted 15-50% of the artifact assemblages, incorrect assumptions regarding "usability" in their scoring would dramatically skew the results of our analysis investigating *de facto* refuse. They are thus removed from further consideration.

Excluding Window Glass: Window glass, another common artifact type, is also excluded from Figures 3.2-3.5. A single window pane (i.e., one artifact) might potentially break into dozens if not hundreds of pieces. Thus, a single broken pane might be scored hundreds of separate times. The extreme fragility of this item may distort a feature's assemblage toward the "fragmentary and non-usable" class, owing merely to size of original single window panes and their feature-specific degree of breakage. For this reason, window glass is similarly excluded from further consideration.

Excluding Broken Bottle Glass: In addition to nails and window glass, Figures 3.4-3.5 further exclude broken bottle glass. Broken bottle glass is excluded for the same reason as window glass: a single broken bottle might result in dozens of separate pieces which, if counted separately, may bias the investigation of *de facto* refuse relative to other refuse types. Other types of broken glass artifacts in the excavated features (e.g., chimney glass; tumblers: pressed or molded glass objects) account for less than 10% (often much less) of each feature's artifact assemblage. These typically derive from smaller complete objects, thus their breakage results in fewer fragments than larger window panes and bottles. For these reasons, no further exclusions of broken glass artifact types are necessary.

Excluding Complete Bottles, and Tin Cans: Figures 3.4-3.5 also exclude complete bottles and tin cans. Like the wire nails above, too many uncertainties are associated with the scoring bottles and cans in terms of "completeness" and "usability." These artifacts were and are still used today as re-usable storage containers. Bottles can be re-used for further liquid storage (particularly home-brewed liquor), and tin cans are used to store small yet plentiful items, such as nails, screws, nuts and bolts, and washers. Viewed in this manner, *any* complete bottle or can could potentially be re-used as a storage container. For present purposes, then, complete bottles and cans (or those that were complete when deposited in the archaeological record) are regarded as "complete and non-usable" items, in the same way as "composite" material class (e.g., clock gears; belt buckles) was regarded above: complete items, not presently usable as found, but potentially usable for some future need. In Figures 3.2-3.3, then, complete bottles and tin cans are scored in the "complete and non-usable" artifact class. On the other hand, a trash dump filled with hundreds of food cans and beer bottles is certainly what it appears to be: a secondary refuse feature filled with artifacts deemed non-usable by their last owners. According to our various scenarios, bottles and cans in trash pits are non-usable items, yet when found inside of foundations are potentially usable (i.e., provisionally discarded). This is ambiguous and untrustworthy. For these reasons, whereas bottles and cans are included in Figures 3.2-3.3, they are excluded from consideration in Figures 3.4-3.5.

To sum up, Figures 3.2-3.5 exclude nails and window glass, and Figures 3.4-3.5 further exclude broken bottle glass, complete bottles, and complete tin cans.

Methods for Evaluating Expectation #1: Distinguishing Separate Analytical Units Within Some of the Excavated Foundations

A final methods-related issue concerns separate distinguishable analytical units or divisions in some of the excavated foundations. Some of the excavated foundations are comprised of discrete, recognizable spatial divisions, such as separate rooms, features adjoining to foundations, as well as stratigraphic divisions. I am referring specifically to the foundations Wiseman 1 and Coldfoot 5. Wiseman 1 is readily divided into its main "habitation room," its attached "side shed," and an adjoining table or "bench"-like feature. Likewise, the assemblage from Coldfoot 5 is readily divisible into those artifacts recovered from below its intact wooden floor (and thus not acted upon by curation and scavenging processes), and those artifacts found above this floor. Potential differences in abandonment processes relating to these separate analytical units are impelling enough to examine them separately. Thus, whereas Figure 3.2 and Figure 3.4 present these two foundations's assemblages combined, Figure 3.3 and Figure 3.5 instead present these two foundations by their separate divisions.

In addition, the Wiseman 1 main "habitation room" data is presented twice in *each* of Figures 3.2-3.5, depending upon how a bag of seed beads is counted. I am referring here to a bag of mostly tiny glass seed beads found within the confines of Wiseman 1's "habitation room." I raise this issue simply because of the large number of seed beads found together in this tiny bag (n=1253), relative to the entire number of artifacts excavated from the Wiseman 1 foundation (N=4,841), which represents 26% of the entire assemblage. While each of these 1253 tiny beads individually may be considered "complete and usable," one could also view the whole bag as a single entity which should be counted only once, not 1253 times. Counting these 1253 beads individually, as opposed to as a single artifact, dramatically changes the percentages for this feature as reflected in Figures 3.2-3.5. Thus, the Wiseman 1 data are presented twice in each figure, depending upon how the reader wants to count this unusual situation. In the figures, "+bead bag" refers to the 1253 beads each being counted separately as a "complete and usable" artifact, and "-bead bag" refers to the entire bead bag counted once as one single "complete and usable" artifact.

Evaluation of Expectation #1

Again, this expectation predicts that "Artifact assemblages in heavily curated and scavenged features and sites will be dominated by non-functional (i.e., no "remnant use-life") abandonment and secondary refuse, relative to usable *de facto* refuse." Figures 3.2-3.5 present each of the excavated feature's assemblages in terms of percentages of "usable" items (both complete and fragmentary; i.e., *de facto* refuse), "complete and non-usable" items (possible provisionally discarded items), and "fragmentary and non-usable" items (primary, secondary, and non-usable abandonment refuse). These data illustrate that, excepting the two last-occupied foundations in the Upper Koyukuk (Coldfoot 14 and Wiseman 1), most of the other features's assemblages are typified by low percentages of usable, *de facto* refuse (<30%), high percentages of fragmentary and non-usable refuse

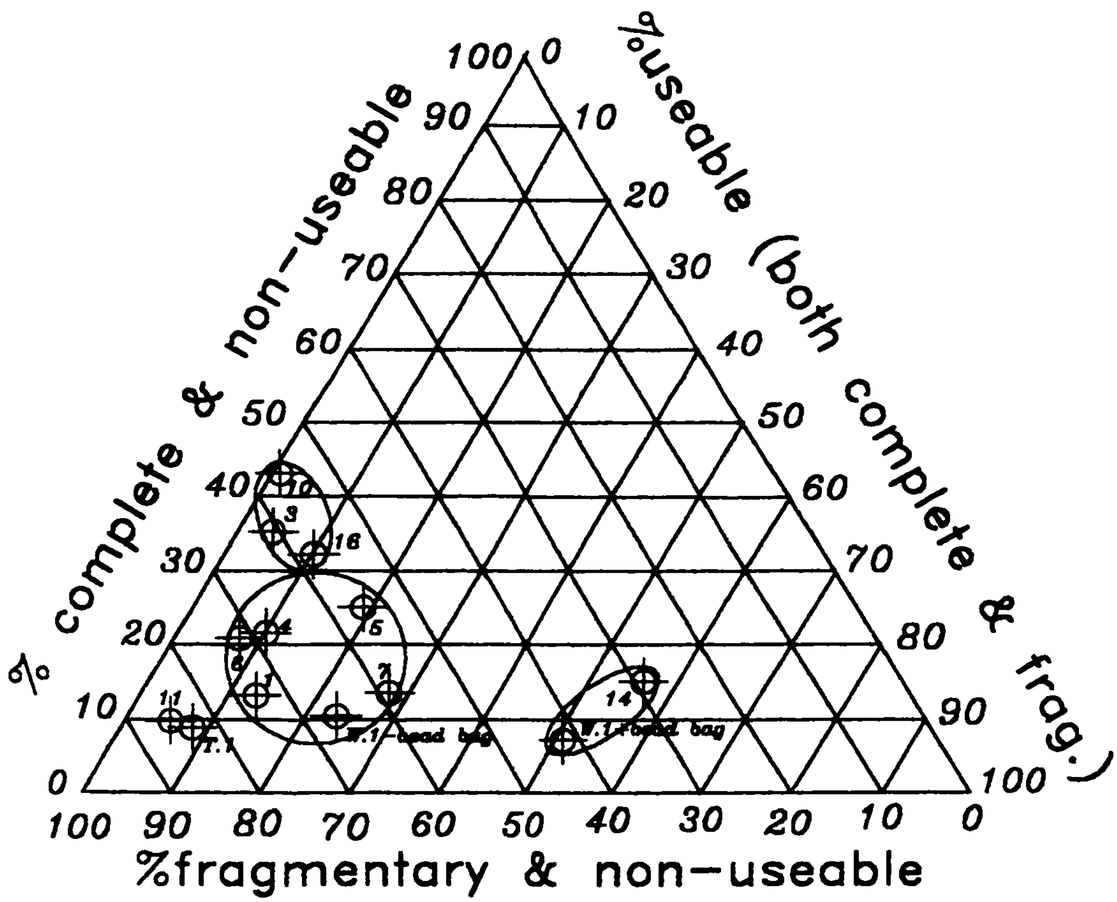


Figure 3.2 Each excavated feature's artifact assemblage reflected as ratios of completeness and usability. Nails and window glass not scored in this figure. Note: Circled groups share similar characteristics and formative processes, including function, abandonment variables, and age. See text for details. Key: foundation, trash pit, privy hole.

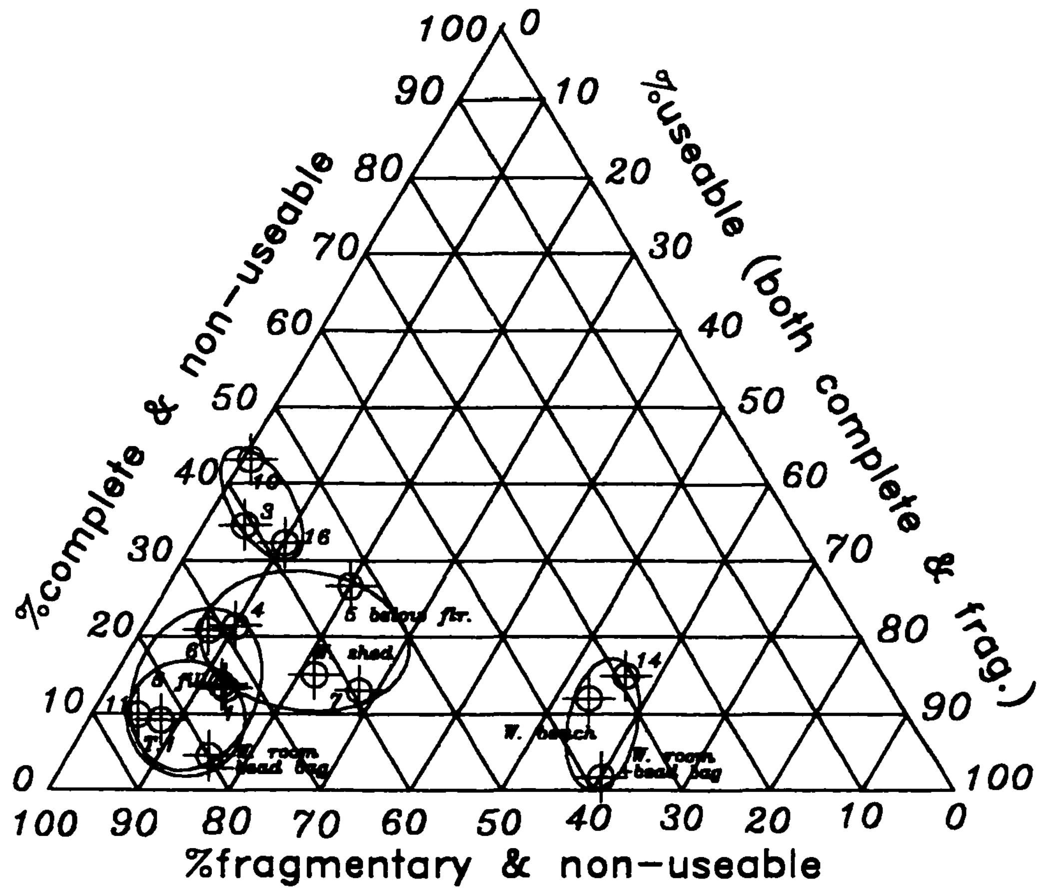


Figure 3.3 Each excavated feature's artifact assemblage reflected as ratios of completeness and usability. Nails and window glass not scored in this figure. Different analytical units in Coldfoot 5 and Wiseman 1 presented separately. Note: Circled groups share similar characteristics and formative processes, including function, age, and abandonment variables. See text for details. Key: foundation, trash pit, privy hole, Wiseman shed and bench.

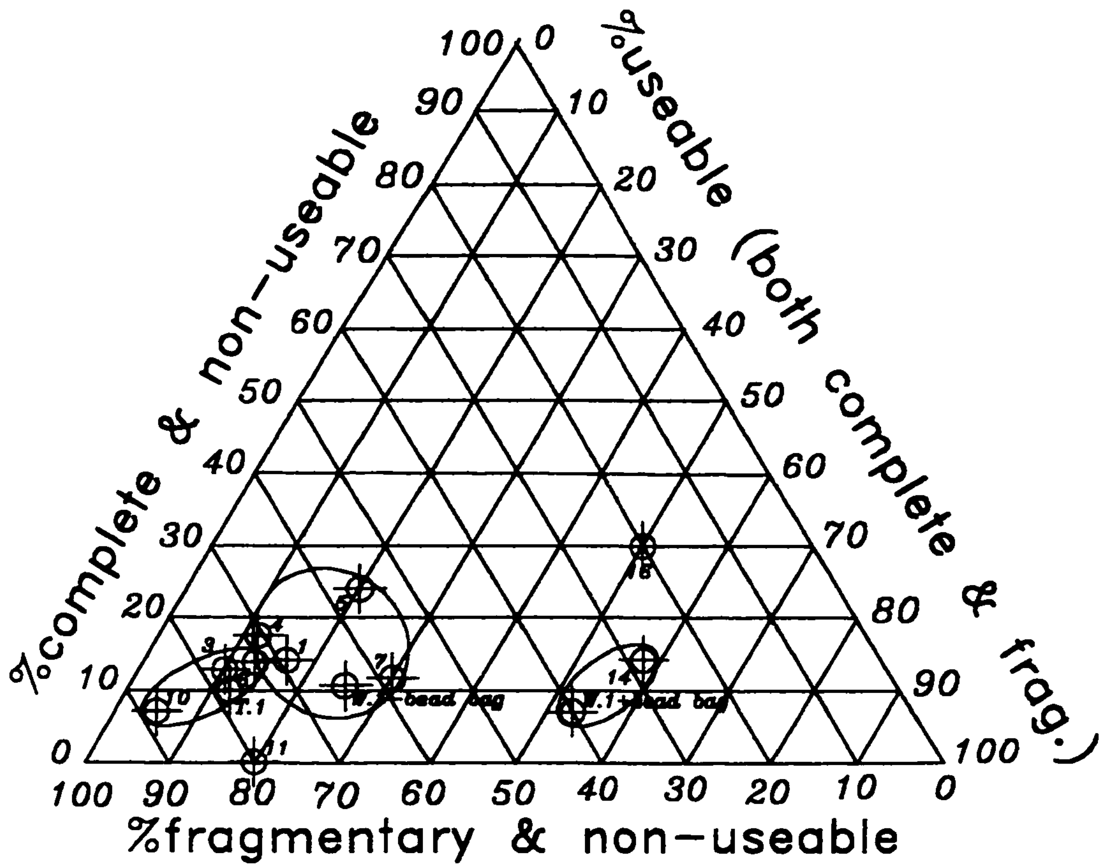


Figure 3.4 Each excavated feature's artifact assemblage reflected as ratios of completeness and usability. Nails, window glass, bottles, bottle glass, and tin cans not scored in this figure. Note: Circled groups share similar characteristics and formative processes, including function, age, and abandonment variables. See text for details. Key: foundation, trash pit, privy hole.

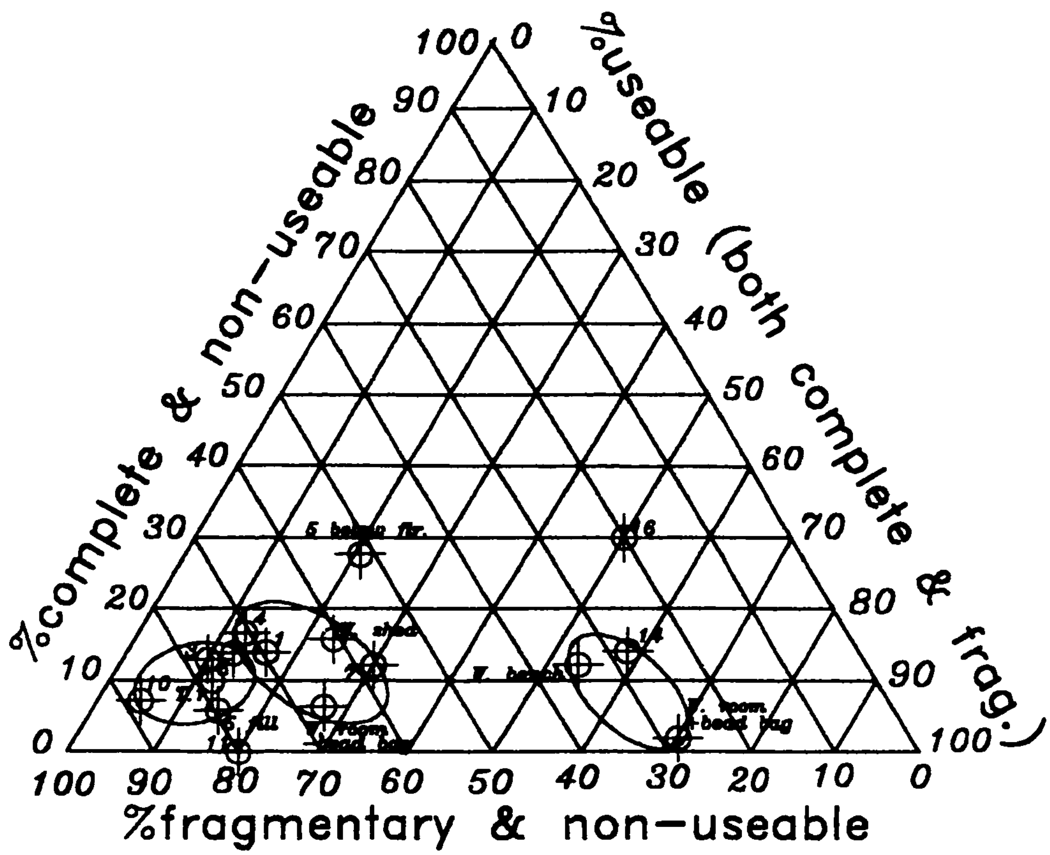


Figure 3.5 Each excavated features's artifact assemblage reflected in ratios of usability and completeness. Nails, window glass, bottles, bottle glass, & tin cans not scored in this figure. Different analytical units in Coldfoot 5 and Wiseman 1 represented separately. Note: Circled groups share similar characteristics and formative processes, including function, age, and abandonment variables. See text for details. Key: foundation, trash pit, privy hole, Wiseman shed and bench.

(>50%), and variable amounts of "complete and non-usable" refuse (0-45%, depending upon figure and feature).

Coldfoot 16 is anomalous in some of the figures, displaying a seemingly high percentage of usable items (50%, n=5 of 10) when cans and bottles are removed from consideration (Figures 3.4-3.5). This feature is a culturally-dug (i.e., not a natural depression) rectangular pit that contained relatively few artifacts (N=52) in comparison to similar trash pit features (Coldfoot 6, Coldfoot 10), which contained more than 830 items each. Its anomalous placement in Figures 3.2-3.5 may relate to not being directly compatible to other seemingly similar cultural trash pits; that is, it may have performed a different function for most of its use-life prior to having refuse deposited within it. Coldfoot 16 is spatially situated in the town site next to Coldfoot 5 (a foundation), along with a large ravine filled with trash (Coldfoot 25; see Figure 2.2 for Coldfoot features locations). Since the Coldfoot 5 foundation had no subterranean cellar or cold storage box, unlike most other foundations excavated at Coldfoot, Tofty, and Wiseman, Coldfoot 16 may have originally served as an outdoor cold storage pit for foundation Coldfoot 5, and was only used for brief refuse disposal upon final abandonment. This might explain its limited total number of artifacts, and its differential placement in Figures 3.2-3.5, relative to other excavated features that have been functionally designated as secondary trash receptacles (i.e., Coldfoot 3, 6, and 10). Although Coldfoot 16 is displayed on all figures discussed here (Figures 3.2-3.5), its problematic primary function and its lower artifact count makes problematic its comparison to other features.

As outlined next, there are few discrepancies from what is expected in Figures 3.2-3.5, in light of accepted functions, ages, and contextually-specific abandonment details of the excavated features. All of the figures show that two of the last-occupied and thus last-abandoned features excavated in the Upper Koyukuk sites (Coldfoot 14 and Wiseman 1) "bunch" together with relatively high percentage of usable artifacts. As is expected, secondary trash pits Coldfoot 3, 10, and 16 cluster together on the figures, owing largely to their high percentages of empty but complete tin cans, which, when removed (Figures

3.4-3.5) shift them to the low left corner in the figures (i.e., low percentages of "complete and usable" items, high percentage of "fragmentary and non-usable"). All of the figures further show earlier-occupied and abandoned foundations in Coldfoot exhibiting overall similar percentages (Coldfoot 1, 4, 5, 7). These foundations are joined by Wiseman 1 when its "bead bag" is considered as a single artifact. This makes sense, as the Wiseman 1 main "habitation room" exhibits the same high degree of structural scavenging as other wood-scavenged foundations in Coldfoot, indicating that it underwent similar abandonment processes.

Figures 3.2-3.5 also illustrate the close percentages and hence bunching together of the Coldfoot 4 foundation and its associated secondary refuse trash pit Coldfoot 6, which was located less than two meters away. The continuous close similarity of these two features's percentages likely illustrates the related nature of these two features during abandonment. This trash pit (Coldfoot 6) contains higher percentages of usable, *de facto* refuse than any other unambiguous refuse pit in Coldfoot through all of the figures, and even has higher percentages than two of the foundations when tin cans and bottles are removed from analysis (Coldfoot 4 and Tofty 1; Figures 3.4-3.5). Such a high percentage of usable items from trash pit Coldfoot 6 include in part: a stack of unused (no nail holes) metal roof or wall shingles that are made from detached panels of 5 gal. fuel cans, other sheet metal, and sections of unfurled stove pipes; numerous holed sew through buttons; and other miscellaneous items including a door hinge, a double-headed axe head with *in situ* sawn off wooden handle, a rod-like brace, a harmonica, and a marble. These artifacts resemble provisionally discarded items, that is, potentially usable and often easily-replaceable items that are retained for future use, but which are typically abandoned upon final abandonment. The relatively high percentage of provisional refuse found in this refuse pit is anomalous for both its function as a receptacle of secondary refuse, and its early date of abandonment (see Figure 2.4) in which it is anticipated that this feature ought to have less usable refuse than later-dated features owing to higher potential scavenging (see Evaluation of Expectations #3 and #4 for a continuation of these points). Coldfoot 6 and Coldfoot 4 are found to be anomalous in other evaluations, to which we will examine in turn.

The different percentages of refuse found in Wiseman 1's separate rooms and features, as reflected in ratios of completeness and usability, need to be discussed further. This partially excavated foundation is divided into a main "habitation room," an adjoining "shed" or overhang, and an adjoining collapsed table or "bench"-like feature (see Appendix B, Figure B.8). The "shed" contained an intact and *in situ* set of wooden floor boards and underlying joists. Upon the "shed's" floor boards (and also partial sections of floor boards in adjoining "habitation room" excavation units) were found concentrations of hundreds of artifacts. When contrasting the floor-scavenged "habitation room" with these adjoining intact floor board areas (Figures 3.3, 3.5), the figures show that the percentage of "complete and non-usable" items is consistently much higher in Wiseman 1's "shed" than in its main "habitation room" and associated "bench" feature. The data indicate that the "complete and non-usable" items piled on the floor boards of the "shed" are predominantly of the "composite" type of refuse for this category, which again are items that are not usable in their present condition, but could be at some future date. That is, the "composite" nature of the "complete and non-usable" artifacts piled on top of the "shed's" floor resemble provisionally discarded refuse, which were ultimately discarded en mass upon final abandonment.

Many of these artifacts on the "shed's" floor boards are related to dog or horse transportation, including sliced and complete harness pieces, many keep rings, dozens of used and unused horseshoe nails, sled runner sections, etc. Hundreds of personal artifacts, construction-related and other hardware artifacts, hunting-related, transportation-related, and domestic artifacts are piled upon these floor boards, none of it intrinsically costly in terms of monetary replacement value. Again, this situation most resembles a mass of provisionally discarded refuse: both usable and non-usable, complete and non-complete items saved and stored away for potential future use, but ultimately abandoned all together. Similar storage-like sheds, overhangs, or entryways filled with comparable provisional refuse adjoin most cabins in Wiseman today.

Finally, the collapsed "bench"-like feature outside and adjacent to the Wiseman 1 foundation exhibited a collection of items stored both on top and below it, most of which (88%; n=15 of 17) were culinary items, including various tin or enamelware items (five plates, a cook pot, a coffee pot, a circular pie plate), a spoon, and six ceramic washbasin sherds (numerous other fragments of this latter artifact were also found inside the foundation). The remaining two items from the partial excavation of the "bench" were a complete storage trunk hinge-and-lock, and a complete metal shoe arch support. All of the artifacts found associated with the "bench" excepting the washbasin sherds are either in a usable condition (n=9), or else in a "complete and non-usable" condition (n=2). Owing to the relatively high number of complete and/or usable items excavated both on and under the "bench" feature, it seem that this area of the foundation did *not* undergo thorough curation or scavenging during and after abandonment.

Evaluation of Expectation #2: Any *de facto* refuse that is present inside of excavated foundations will be dominated by "smaller" items and relatively few (if any) "larger" items.

Methods for Evaluating Expectation #2

For the purpose of evaluating Expectation #2, "size" is viewed along an increasing continuum of 5 cm increments. Figures 3.6-3.7 illustrate the size categories of the usable, *de facto* refuse, in 5 cm increments, from all excavated foundations, trash pits, and privy (see Table 3.1)[1]. That is, the greatest single dimension of the usable artifacts from a feature, be it length, height, diameter, or width, are scored and tabulated within 5 cm ranges (e.g., 0-5 cm range; 6-10 cm range). The data are presented as percentages of each 5 cm range's total within a feature's assemblage. For example, 86% of the *de facto* refuse from foundation Coldfoot 1 have greatest dimensions of only 0-5 cm (see Figure 3.6). Turning the numerical data into percentages allows inter-feature comparisons.

Figure 3.8 examines individually those separate spatial analytical units for foundations Coldfoot 5 and Wiseman 1, that were outlined in Evaluation #1. That is, the Coldfoot 5 *de facto* refuse is presented separately in terms of its two basic divisions, below its intact wooden floor ("below floor"), and above the floor ("fill"). The Wiseman 1 *de facto* assemblage is divided into its main "habitation room," its adjoining "shed," and its adjoining "bench"-feature. Likewise, the Wiseman 1 main "habitation room" is reflected twice, in terms of how the 1253 beads in the "bead bag" were scored, either individually or as one artifact. The numerical data for the Figures 3.6-3.8 are presented in Table 3.1.

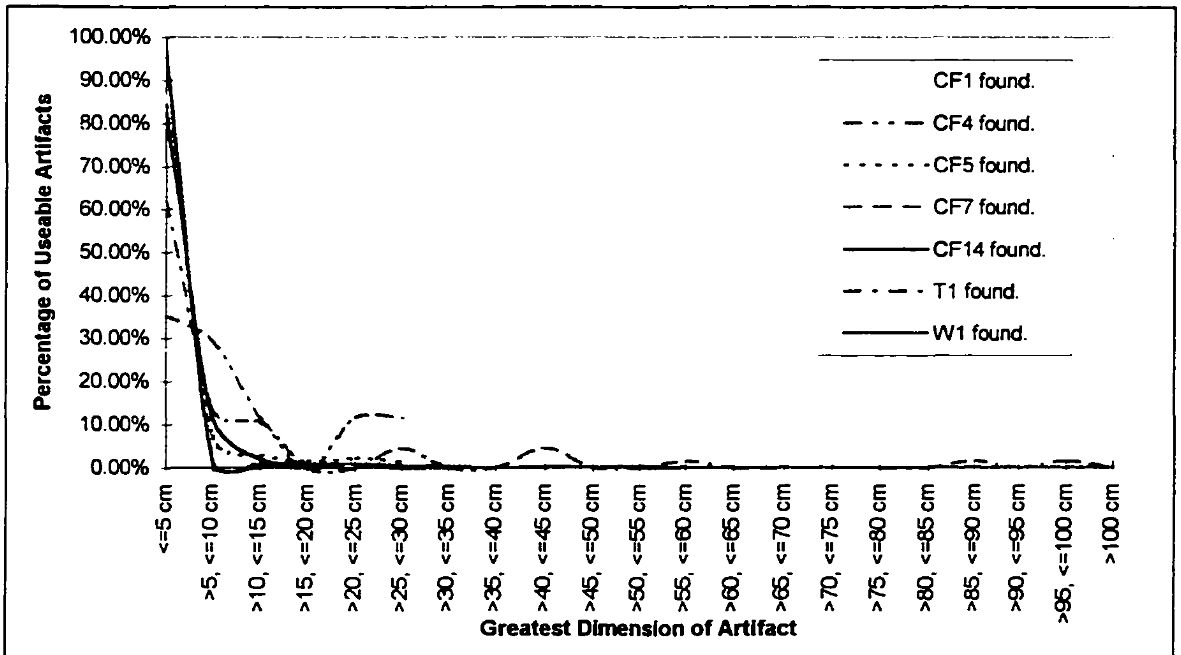


Figure 3.6 Size distribution of usable artifacts from the excavated structural foundations at Coldfoot, Tofty, and Wiseman, presented in percentages of each size class in a foundation's artifact assemblage[1].

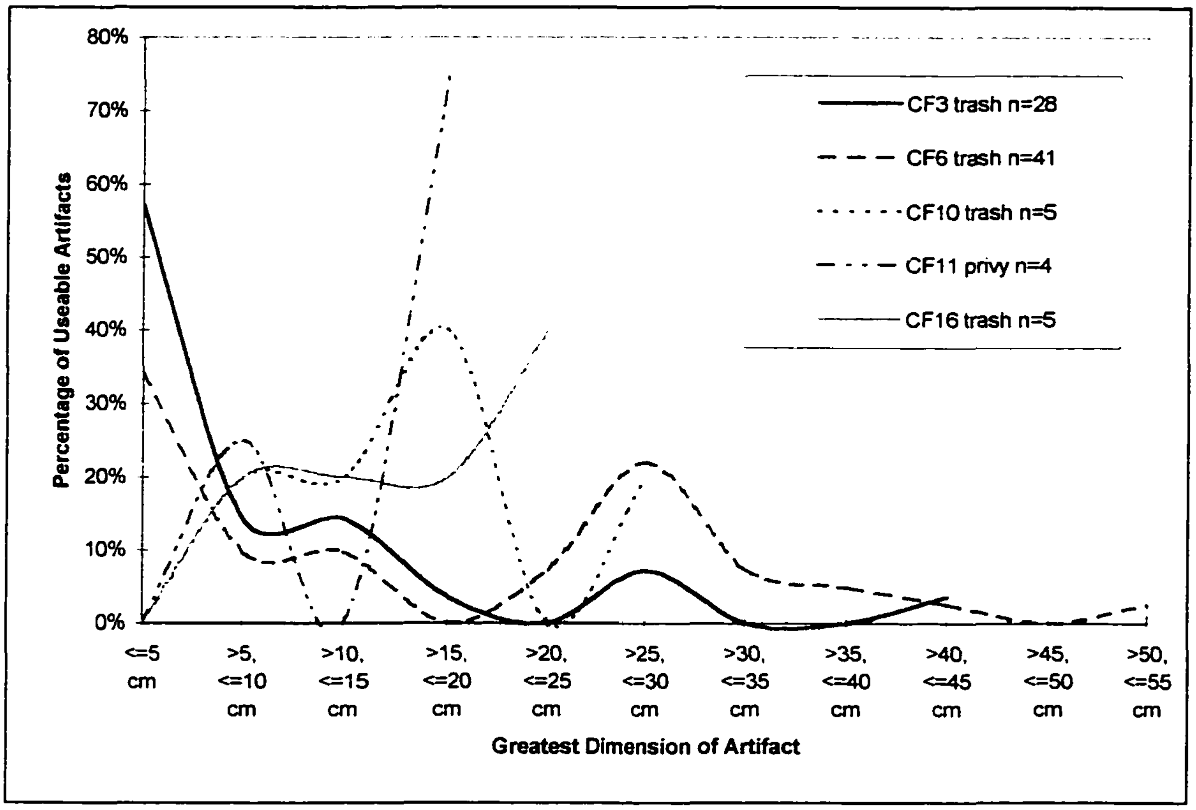


Figure 3.7 Size distribution of usable artifacts from the excavated trash pits and privy hole at Coldfoot, presented in percentages of each size class in a feature's artifact assemblage[1].

Evaluation of Expectation #2

As outlined above, small *de facto* refuse is expected in abandoned features and settlements where (1) intra-mining district and intra-settlement transport is not a constraining factor in moving material goods, and (2) abandonment is planned and gradual. Also, in isolated locales where transport into the mining district is a constraining issue (e.g., Upper Koyukuk pre-1974), it was postulated that (3) larger artifacts would be preferentially curated and scavenged owing to their higher potential material reserve value. Furthermore, it was suggested that (4) under conditions of dismantling wooden structures, not only will larger items intentionally and unintentionally end up alongside wall sill logs,

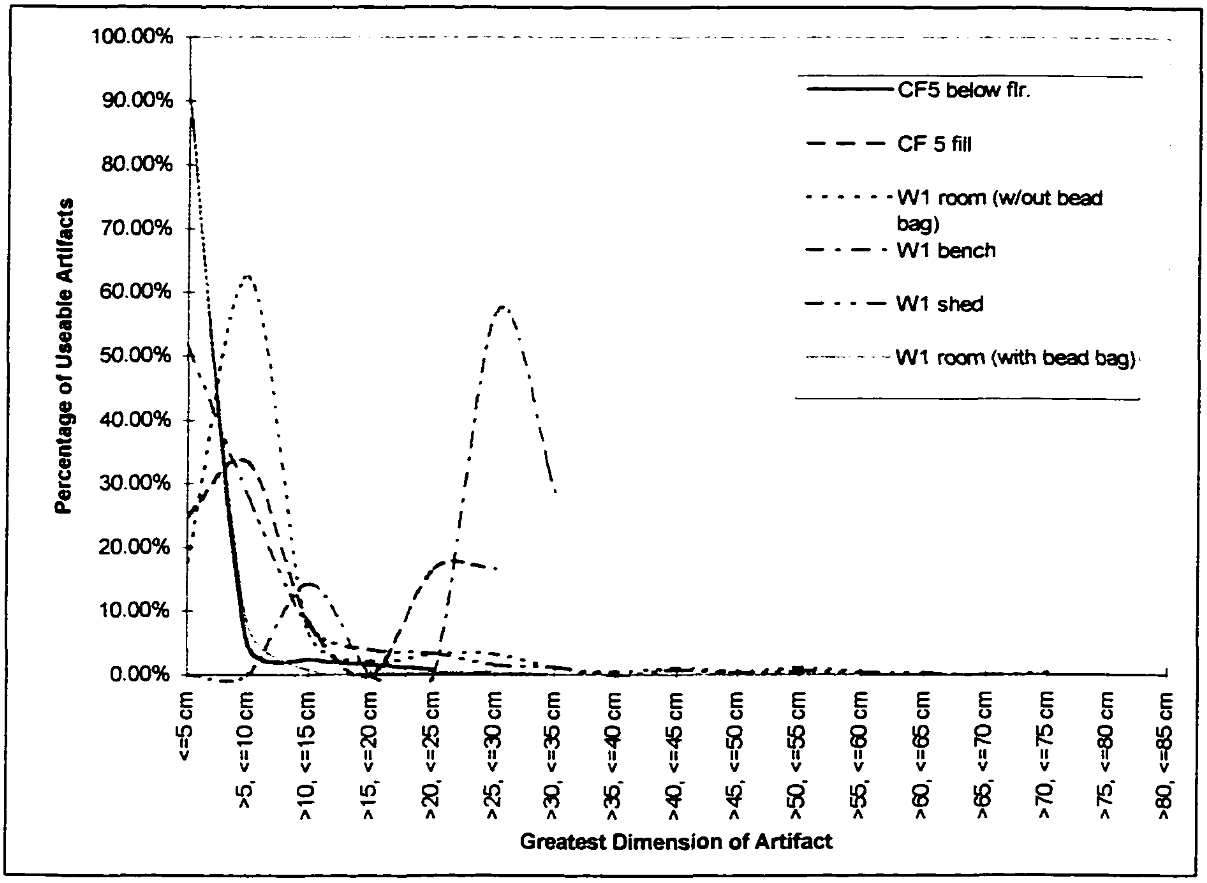


Figure 3.8 Size distribution of usable artifacts from separate analytical units in Coldfoot 5 and Wiseman 1, presented in percentages of each size class in a analytical unit's artifact assemblage[1].

but that they will also be disposed of outside of foundations. Unfortunately, no large-scale excavations took place outside of the boundaries of a foundation's sill logs. While larger items may have been removed from inside of the excavated foundations and thrown outside of their confines during their dismantling for firewood, there is presently no way to corroborate this idea without further excavations.

Figures 3.6-3.8 clearly illustrate the near-total dominance of "small" items (if ≤5 cm can be typified as "small") among the *de facto* refuse in most of the excavated features. The only exceptions are Coldfoot 10, a trash pit dominated by tin cans and with only five usable artifacts (Figure 3.7), the Wiseman 1 "bench"-like feature with its numerous

Table 3.1 Numbers of useable artifacts in each excavated feature, by 5 cm increments (Coldfoot= CF; Tofty= T; Wiseman= W; structural foundation= ST; trash pit= TP; privy= P).

cm	ST CF1	TP CF3	ST CF4	total ST CF5	below flr. CF5	fill CF5	TP CF6	ST CF7	TP CF10	P CF 11	ST CF 14	TP CF 16	ST T1	bench W1	shed W1	(+beads) W1 ST	(-beads) W1 ST	(+beads) W1 room	(-beads) W1 room
<=5	259	16	6	114	111	3	14	84			713		40		170	1456	203	1286	33
>5, <=10	16	4	5	10	6	4	4	1	1	1	13	1	9		93	209	209	116	116
>10, <=15	5	4	2	4	3	1	4	1	1		3	1	7	1	26	38	38	12	12
>15, <=20	5	1		2	2				2	3	4	1			13	17	17	4	4
>20, <=25	2		2	3	1	2	3	1			7	2			11	17	17	6	6
>25, <=30	5	2	2	2		2	9		1				3	4	5	11	11	6	6
>30, <=35	3						3				1			2	4	6	6	2	2
>35, <=40							2									1	1	1	1
>40, <=45	1	1					1				1		3		3	5	5	2	2
>45, <=50	1										1				1	2	2	1	1
>50, <=55							1				1				2	4	4	2	2
>55, <=60													1		1	2	2	1	1
>60, <=65	1										1				1	1	1		
>65, <=70	1																		
>70, <=75															1	1	1		
>75, <=80																			
>80, <=85	1																		
>85, <=90													1						
>90, <=95																			
>95,<=100													1						
>100																1	1		
TOTAL	300	28	17	135	123	12	41	87	5	4	745	5	65	7	331	1771	518	1439	186

culinary items (Figure 3.8), and the Wiseman 1 "habitation room" without reference to the "bead bag" (n=1253 seed beads, all ≤5 mm diameter; Figure 3.8). As can be seen in the figures, usable artifacts larger than 5 cm are rare.

Figure 3.6 illustrates the overall similarity of size percentages of *de facto* refuse in the excavated foundations, regardless of estimated temporal occupation of each foundation. Most of the excavated foundations present a near-conformity of percentages of size categories of usable artifacts displayed by the other foundations, which all have 80% or more of their usable artifacts with greatest dimension ≤ 5 cm, and only trace percentages of other artifact size ranges (Figure 3.6). Only Tofty 1 and Coldfoot 4 deviate slightly from this overall pattern. One reason for Coldfoot 4's non-conformity in *de facto* refuse size pattern (relative to the other foundations) may be its high percentage of possible provisionally discarded refuse found in this foundation and its associated trash pit, Coldfoot 6. Tofty 1's non-conformity to this same size pattern may relate to its unique abandonment characteristics relative to most other excavated foundations in Coldfoot and Wiseman: potential episodic short-term use of a (partially) standing structure into the 1960s, much later than the others; and the catastrophic nature of its final demise by fire, which would have prevented a final scavenging episode. Tofty 1's position next to a more secure and cheaper transportation system may also have influenced people's decisions regarding curation and scavenging. For example, not counted and illustrated in Figures 3.6-3.8 for the Tofty 1 foundation were numerous large (>100 cm) sheets of corrugated sheet metal scattered around outside the foundation confines. Such sheets are still usable today. Such an amount of large, obvious architectural artifacts were not found around the more isolated Coldfoot foundations. Freighting cost differences between these two locales are a likely explanation for these contrasting data. Whereas the price of supplies in the Upper Koyukuk district doubled because of the final means of transporting goods into the region by either horse scows or dog sleds, goods were transported into Tofty by means of an all-season wagon road directly loaded off of steamers plying the Tanana River (see Chapter 2, Historical Outlines).

It is also evident in Figure 3.6 that only later-occupied foundations contain usable refuse larger than 50 cm (Coldfoot 1, 14; Tofty 1; Wiseman 1), and that only the two latest-occupied structures (Tofty 1 in central interior Alaska, and Wiseman 1 in the Upper Koyukuk) contain usable items larger than 1 m. This conforms precisely to Expectation #2, above. Only a single usable item larger than 50cm is located in any of the non-foundation features, a 52 cm long stove pipe section in Coldfoot 6. Tofty 1's uniqueness in this situation may re-late to its later-utilized status (into the 1960s), or may relate again to any of this site's peculiar abandonment or transportation characteristics, relative to the other two settlements in this study. The presence of larger usable items in later-occupied foundations, particularly Wiseman, may also relate to their having "higher potential material reserve value." That is, the occupants of later-dated foundations would have been in a position to scavenge (larger) items from earlier-occupied foundations and features. This is the same notion as discussed for *de facto* refuse in general in Expectation #1, above: earlier-occupied features and settlements will have relatively less *de facto* refuse than later-occupied features and settlements, owing to more potential curation and scavenging time.

What are these large items? Table 3.2 outlines usable artifacts from all features that are >50 cm. The items from inside the excavated Coldfoot features are typical of similar large items found scattered throughout this old town site. Two large hand-sheared triangular sheet metal sections (Coldfoot 1) and a handmade stove pipe "safety" box (i.e., one end removed, one end with pipe hole cut into it; for insertion into roof to keep hot stove pipe from ceiling elements) from Coldfoot 14 were typical artifacts from this site, with the two large metal sheets from Coldfoot 1 being unusual only in their extremely large size. Coldfoot 1's two large metal sheets are triangular remnants cut from even larger metal sheets. They are probably provisionally discarded items left behind at final abandonment. Likewise, the handmade "safety" box was a typical artifact at Coldfoot, and is a common item noted at other historic and mining-related sites in Alaska, as perceived by myself and other cultural resource specialists during reconnaissance and survey. The "safety" box represents an expedient use of a commonly available raw material, and is easily replaceable. A smaller box-like "safety" was located inside the foundation of Coldfoot 1, and another made from a 5-gallon fuel can outside of the Coldfoot 7 foundation.

Table 3.2 Usable (*de facto*) refuse > 50 cm Largest Dimension from Coldfoot, Tofty, and Wiseman.

Feature	Length (cm)	Artifact (n=1)
Coldfoot 1	61	hack saw blade
Coldfoot 1	70	hand cut/sheared sheet metal; possible roof/wall shingle or plate
Coldfoot 1	85	hand cut/sheared sheet metal; possible roof/wall shingle or plate
Coldfoot 6	52	stove pipe section
Coldfoot 14	55	stove pipe "safety" box handmade from rectangular 5 gal. fuel can
Coldfoot 14	65	handmade soldered pipe section; complete and finished; function unknown
Tofty 1	60	stove pipe section
Tofty 1	90	metal rifle cleaning rod
Tofty 1	100	handmade wire loop ("figure 8") hand-crank fastener
Wiseman 1 "shed"	52.5	solid bolt-like rod, threaded one end, head hand-flattened
Wiseman 1 "shed"	52.5	zipper
Wiseman 1 "shed"	53	zipper
Wiseman 1 "shed"	54	leather horse bridle harness piece with buckle
Wiseman 1 "shed"	56	metal outer sill foundation log sheet metal flashing; found in situ; hand sheared
Wiseman 1 room	58.5	(possible) rubber and cloth horse harness pad
Wiseman 1 room	62	curved cut piece rubber from tire's inner tube; tentative "usable" score for re-use
Wiseman 1 room	71.7	metal outer sill foundation log sheet metal flashing; found in situ; hand sheared
Wiseman 1 room	175	draft horse harness section for attach team to singletree

Other >50 cm usable artifacts from Coldfoot included a section of stove pipe (Coldfoot 6), a handmade soldered "pipe" (4 cm diameter) with a right-angled elbow at one end (Coldfoot 14), and a large complete hack saw blade (Coldfoot 1). Thus, taken together there are only six usable artifacts >50 cm from the Coldfoot excavations, out of 1,367 usable items and a total of 11,292 artifacts. All six of these >50 cm usable artifacts from Coldfoot, except the hack saw blade, represent plentiful, easily replaced (i.e., low replacement cost) items. As has been point out already, Coldfoot 1 and Coldfoot 14 are the oldest of the excavated foundations from Coldfoot, possibly representing a factor for the presence of these larger items in these structures (i.e., less scavenged) , and the lack of such items in earlier-dated structures (i.e., more scavenged).

Artifacts >50 cm from Tofty 1 include a stove pipe section, a metal rifle cleaning rod, and a handmade, hand-twisted length of wire used to tighten/secure two items such as posts or rafters. The wire fastener is indicative of an expedient, cheap, easily replaced item, and the stove pipe section too was likely a low cost, relatively abundant item on the site. The machine-manufactured rifle cleaning rod is interesting. It was located in the subterranean cold cellar box located in the center of this foundation which, when excavated, revealed (among other artifacts) a complete shotgun barrel (no stock or hardware; break-open single barrel; 16 or 20 gauge) and a broken proximal section of another gun cleaning rod (hand made). These items are perhaps indicative of caching behavior; items stored away within the subterranean box and not retrieved after the 1969 fire swept through the site.

All remaining artifacts >50 cm were recovered from Wiseman 1 (n=9; Table 3.2). Most of these remaining objects are either easily replaced items (e.g., metal foundation flashing), or are likely items or raw materials stored away for future use (e.g., leather from harness-related items; rubber; zippers). Although larger in size, these nine Wiseman artifacts are similar in nature to hundreds of other *de facto* and/or provisionally discarded items (usable, or composite "complete and non-usable") inside this foundation, especially those piled upon its wooden floor sections.

Figure 3.7 illustrates the size categories of usable artifacts from the excavated trash pits (Coldfoot 3, 6, 10, 16) and privy (Coldfoot 11). Two of the four trash pits's size patterns conform closely with each another (Coldfoot 3 and 6). Size patterns for the each of the other feature's in this figure are unique (Coldfoot 10, 11, 16), but all are typified by not having any usable items ≤5 cm. a direct contrast to all of the other excavated foundations and trash pits presented thus far. While these three anomalous size patterns may relate to the small sample of usable items recovered from each feature (n=5, 4, 5, respectively from Coldfoot 10, 11, 16), other characteristics of the features might explain in part their unusual size patterns. For instance, Coldfoot 11's primary function was as a privy, and Coldfoot 16, as suggested earlier, may have originally been an outside subterranean cold storage box associated with foundation Coldfoot 5, and thus was not a regularly used secondary refuse receptacle. Trash pit Coldfoot 10 was unusual in having such a high percentage of tin cans relative to all of other types of artifacts (75%; n=624 of 835), which may indicate that it serviced a functionally-different structure than other trash pits (e.g., a roadhouse as opposed to a domestic structure).

Finally, Figure 3.8, like Figures 3.6-3.7, illustrates size categories of usable, *de facto* refuse in 5 cm increments, this time examining the separate spatial divisions of Coldfoot 5 ("below floor," and above floor or "fill") and Wiseman 1 ("habitation room," "shed," "bench"-feature, bead bag). As might be expected, these data (Figure 3.8) exhibit no similarities in their size patterns, for the variables responsible for the formation of each deposit are all unique relative to one another. The usable artifacts (all artifacts for that matter) below the intact wooden floor of the Coldfoot 5 foundation are overwhelmingly ≤5 cm (90%, n=111 of 123 usable artifacts; 98.4%, n=1183 of 1202 total artifacts), or else are relatively flat. The usable items from beneath the floor are also artifacts with apparent remnant use-life and higher than normal replaceability value, but were obviously overlooked because they were hidden from view underneath the floor boards, or wedged between them. Usable items larger than 5 cm that would surely have been curated or scavenged under normal circumstances include horse/dog harness hardware, a fish hook, a live round of ammunition, two spoons and a kitchen knife, a pocket knife, a pencil, a hook/eye hardware piece, and a key. The reason for the small size of the usable below-floor artifact assemblage in this setting thus differs from other foundations: actual concealment, as opposed to loss, oversight, or cultural decisions relating to replacement cost and remnant use-life.

The Wiseman 1 main "habitation room" (Figure 3.8) conforms to the familiar pattern of other scavenged and curated structural foundations (as seen in Figure 3.6) when the "bead bag" (n=1253 seed beads, counted individually) total is included. Without the bag though, the Wiseman 1 "habitation room" has more than three times the number of usable artifacts in the ">5 and ≤10 cm" size range than the "≤5 cm" size range, a pattern more consistent with Coldfoot 4 than all other structural foundations (Figure 3.6). As suggested earlier, the late-abandonment of provisionally discarded refuse is a possible explanation for the patterns in the Coldfoot 4 foundation (and associated trash pit Coldfoot 6). Wiseman 1 too seems to conform to such an abandonment scenario, that is, a later-utilized structure with a large amount of low-cost, easily replaceable, provisionally-stored materials, much of which was discarded en mass at final abandonment. We had already suggested above that the Wiseman 1 "shed" artifacts appear to represent a large-scale deposition of provisionally stored refuse. Thus, it is no surprise that it (the "shed") is the only other pattern on either Figure 3.6 or 3.8 that is similar to the percentage pattern indicated by the Wiseman 1 main "habitation room" (*sans* bead bag) and Coldfoot 4. They all may represent the same abandonment scenario, that of later-occupied or otherwise later-utilized features with an artifact assemblage containing non-scavenged and abandoned, provisionally discarded refuse.

It is posited then, that at least in the more-isolated Upper Koyukuk settlements discussed here (Coldfoot and Wiseman), final relative temporal use or abandonment of a structure in a settlement or mining district may be apparent in specified artifactual attributes (usability; size) which are related to provisional discard, curation, and scavenging. Based upon date ranges supplied by artifact types, foundation Coldfoot 4 and associated trash pit Coldfoot 6 are the earliest-dated of the excavated features in this study (see Figure 2.4). However, these same two features possess abandonment-related attributes indicative of a later-abandoned structure in Coldfoot: higher percentages of complete and/or usable artifacts than expected for these earliest-dated features (see Evaluation of Expectation #1), and now larger than expected *de facto* refuse than expected for these features. This ambiguity is explained if (1) the artifactual dates relate to an early use of Coldfoot 4 as a habitation structure (a function implied by its subterranean cold storage box), and (2) if the abandonment analysis of the same data relates to a re-use of the features at a later time which did not supply more-recent artifacts to the assemblages (e.g., storage or caching). If this scenario is correct, it is demonstrated that an abandonment-focused analysis of an archaeological assemblage may indicate behavioral and temporal information not apparent from other, more traditional means of artifact analyses. This scenario is further supported by the non-conformity of Coldfoot 4 and 6 to Expectation #4, below.

Artifact Condition Through Time

Evaluation of Expectation #3

Again, Expectation #3 predicts that relative numbers of usable artifacts in structural foundations should be fewer in earlier-abandoned structures, and greater in later-abandoned structures. That is, percentage of usable artifacts will increase later (i.e., more recent) the date of abandonment of a structure. The earlier a structure was occupied and abandoned, the more potential (i.e., time) there is for curation, delayed curation, and subsequent scavenging and looting of usable, *de facto* refuse. The earlier a site/structure is occupied and episodically abandoned, and where legal or implied ownership of a structure and its contents is understood, continued "delayed curation" over time will keep reducing the percentage of usable artifacts in an assemblage (c.f., Tomka 1993:15-23). When permanent abandonment of a structure finally occurs, subsequent scavenging of materials in that structure will take place by remaining settlement residents (c.f., Montgomery 1993:158). Essentially, the older the foundation, the more "scavengeability potential" it has, and the lower and lower percentage of usable items it will contain.

Figure 3.9 plots the percentage of usable, *de facto* refuse in the assemblages of excavated structural foundations at Coldfoot against their median dates (see Chapter 2, Archaeological Feature Chronology). In short, the figure illustrates a close curvilinear relationship between these two variables (time; usable artifact percentage), and corroborates the expectation that later-abandoned structures have more *de facto* refuse than earlier ones. Figure 3.9 needs to be viewed in light of the proposition presented above regarding the Coldfoot 4 foundation. Again, it was posited that although Coldfoot 4 and its associated trash pit Coldfoot 6 were the earliest dated features excavated in

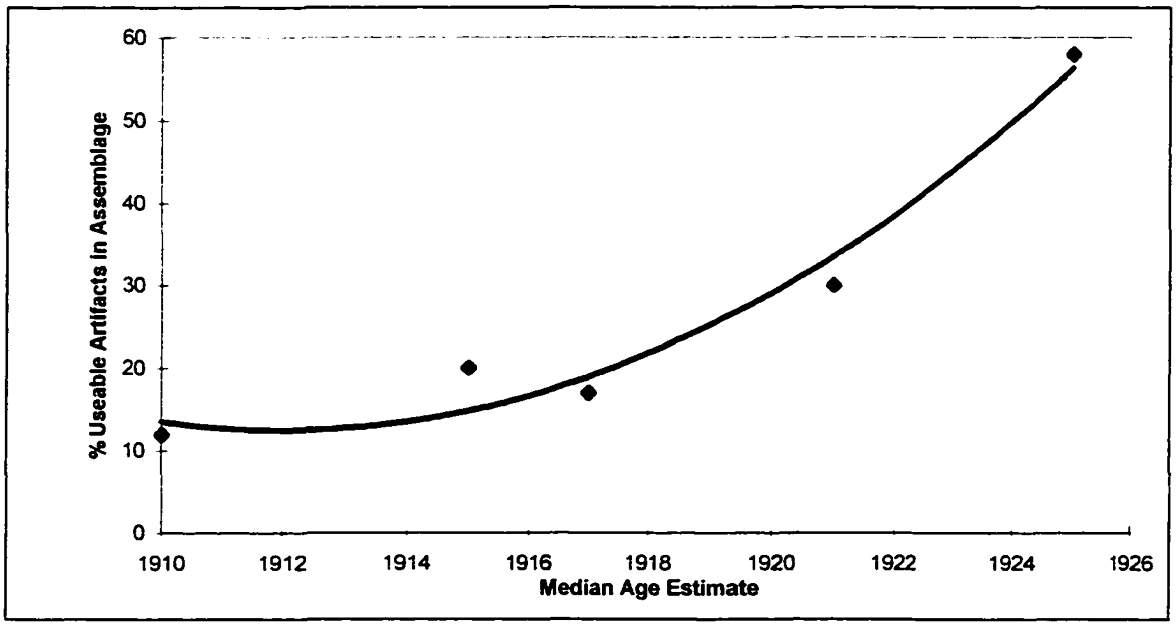


Figure 3.9 Percent of usable or de facto refuse of each excavated Coldfoot foundation, plotted against each foundation's median occupation age. Coldfoot 4 (1910), Coldfoot 5 (1915), Coldfoot 1 (1917), Coldfoot 7 (1921), and Coldfoot 14 (1925).

Coldfoot, as indicated by dates associated with certain artifacts in their assemblages, other attributes of their assemblages (size; usability) may indicate re-use of these two features at a later time. If the Coldfoot 4 foundation actually was re-utilized at a later time (see Evaluation of Expectation #2), then its "median date" used in Figure 3.9 needs to be adjusted, and likely the close curvilinear aspect presented in this figure would be disturbed. Additional research involving features having better understood abandonment processes is needed to further investigate these issues.

Evaluation of Expectation #4

Again, Expectation #4 predicts that later-occupied structures in a settlement not only have less potential for being scavenged, but their occupants also had the opportunity to scavenge from other abandoned structures in the settlement (as well as from any nearby settlements), and to "enrich" their material inventories through "hoarding" activities. Such "hoarding," if visible archaeologically, should therefore be observed in later-occupied structures. The enrichment of material inventories through "hoarding" activities refers to the accumulation through scavenging of more of an item type than is necessary for a functioning household (Schiffer 1985). To test for hoarding, we need to look at types of material goods which would *not* be passed up given a scavenging opportunity. It is felt that usable construction tools are such an artifact class, given the enhanced self-reliance practiced by many miners. Most miners of necessity were capable of building their own cabins and outbuildings, and constructing dams, flumes and other water-diversion systems. Many/most were capable of fixing, maintaining and even constructing a variety of mechanized engines related to mining and other hardships of life in interior Alaska, including but not limited to boilers and generators, and steamer-boat and gasoline launch engines. This was especially true of miners found in more isolated districts. As Robert Marshall noted for the Upper Koyukuk population in the early 1930s, "It is simply taken as a matter of course in that country that every man must be his own carpenter, ship builder, mechanic, and blacksmith if experts in these lines are not available" (Marshall 1991:55). Figure 3.10 summarizes numbers of tool types from excavated structures and any associated trash pits in Coldfoot and Wiseman. The data are arranged in sequential chronological order for the last recognized occupation of each excavated structure, from earliest on the left to latest on the right. These data generally support the notion that the last-occupied structures, Coldfoot 1, Coldfoot 14, and Wiseman 1, contain more variety and greater numbers of usable tools than do earlier-dated structures.

The Coldfoot 4 foundation, and associated trash pit Coldfoot 6, once again do not conform to the general trend. Recall Schiffer's caution that it is not easy to clearly differentiate between scavenged hoards and "excess inventory." Excess inventory

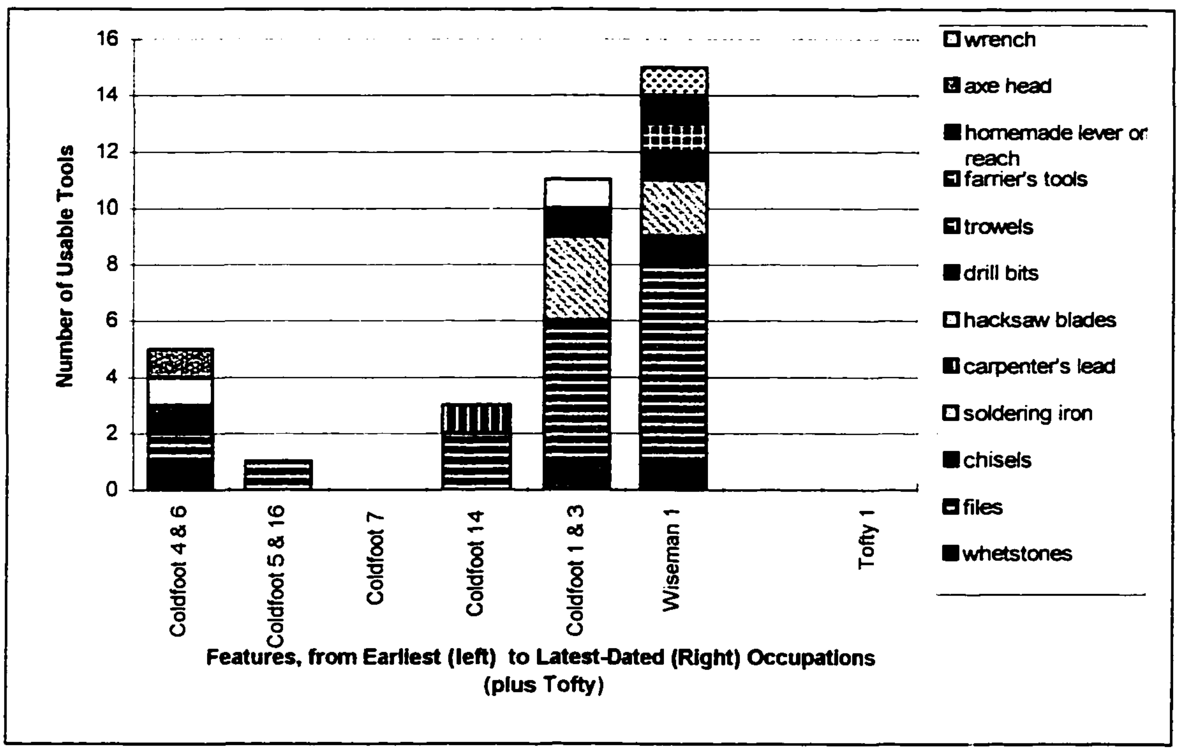


Figure 3.10 Usable construction tools in Upper Koyukuk (Coldfoot, Wiseman) excavated foundations and associated trash pits, plus Tofty 1 foundation. Note increasing number of usable tools the later the date of occupation and abandonment.

is defined as greater numbers of a usable item found in a feature typically because of its higher replacement rate (Schiffer 1985:36). While it cannot be ruled out that Coldfoot 4 may have been, say, a store, whereby it may be expected to contain excess inventory, it is felt that Coldfoot 4's original function was instead a domestic habitation, because of its small size (ca. 3 x 3.75 m.) and the presence of its subterranean cold storage box. "Stores" typically need to display and/or store quantities of commodities for sale, and it is felt in this instance that ca. 3 x 3.75 m, with no evidence of other associated structures, is simply not enough room necessary to serve as a "store" to hundreds of miners in this setting. As discussed above, however, Coldfoot 4 may have been re-used by later inhabitants as a storage or caching facility. This latter scenario accords with the discussions involving Coldfoot 4 above, that of artifact attributes related to abandonment processes typical of later-used and abandoned features (i.e., relatively higher percentages of complete and/or usable items than expected, and larger *de facto* refuse than expected; see Evaluation of Expectation #1 and #2).

What is also interesting regarding the tools from the Coldfoot 4 foundation (and associated trash pit Coldfoot 6), is the <u>diversity</u> of tools relative to the foundation's small size. Along with a file and a cobble whetstone, the other three usable tool types present are <u>unique</u> among all of the excavated Coldfoot features, and include a chisel and soldering iron from the foundation, and a double-headed axe head with *in situ* sawn-off wooden handle from the trash pit. The uniqueness of these data relative to the other foundations (see Figure 3.10) is further illustrated when one adds non-usable tool data together with the usable tools (Figure 3.11). Again, we see here that Coldfoot 4 and Coldfoot 6 resemble later-dated structural foundations (Coldfoot 1 and 14) more than they do earlier-dated ones (Coldfoot 5 and 7) in terms of ratios of usable-to-non-usable tools. One assumes that later-occupied structures will have more usable, *de facto* refuse, owing to their lessened "scavengeability potential." If these inferences are correct, that is, later-occupied structures have greater numbers of usable tools, and high ratios of usable-to-non-usable tools, then Coldfoot 4 appears once again to date later than its artifact dates lead us to believe (see also Evaluation of Expectation #1 and #2).

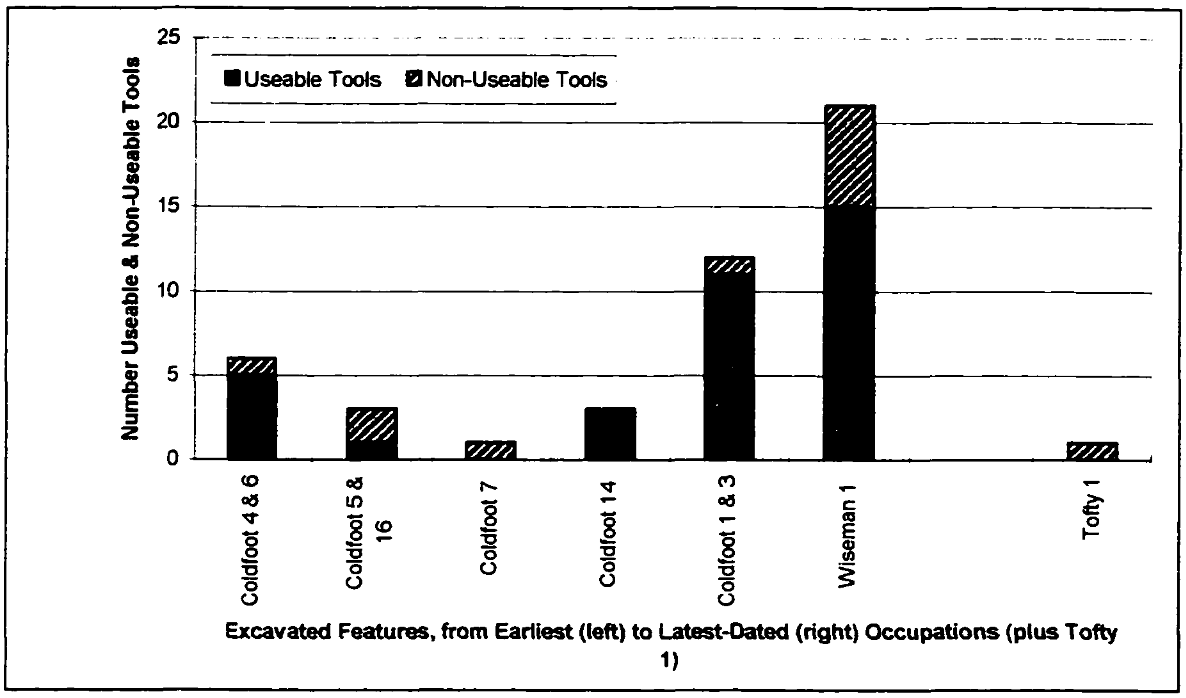


Figure 3.11 Usable and non-usable construction tools in Upper Koyukuk (Coldfoot, Wiseman) excavated foundations and associated trash pits, plus Tofty 1 foundation. Note increasing number of usable tools the later the date of occupation and abandonment.

Evaluation of Expectation #5

Again, Expectation #5 predicts that the longer that buildings are left wholly or partially standing, the higher their scavengeability potential, and the increased potential they have to accumulate primary and secondary refuse. This may occur either owing to intentional use as a secondary refuse receptacle, or through (repeated) use as temporary short-term shelters in which maintenance activities are largely suspended. Most of the foundations excavated at Coldfoot, Tofty, and Wiseman represented only the basal structural elements on which the scavenged log cabin structure once stood. These basal foundation elements consist of the outer foundation sill logs, joists on which the wooden floor boards were placed, and any sill or joist bearing pads specific to each foundation. It is likely that the basal wooden elements directly in contact with the ground were too deteriorated or water-saturated to be used for firewood. Remnant, fragmentary sections of *in situ* floor boards were also found in Coldfoot 14 (saved by an extensive tree root system covering them), Coldfoot 7 (a small section overlain by a displaced first wall log), and Tofty 1. In addition, wooden floor boards were uncovered in adjoining "shed"-like structures or overhangs in Coldfoot 1 and Wiseman 1. All other floor boards from these latter two features's main rooms had been removed.

However, two foundations, Coldfoot 5 and Tofty 1, contained structural elements beyond these basal components. Coldfoot 5 was the only excavated structure with an intact, *in situ* wooden floor, which was nailed onto five underlying floor joists lying directly on top of fine sands and silt (see Appendix B, Figure B.4; floor boards not present in figure). This foundation also contained *in situ* the first wall logs above each of the four sill logs, as well as numerous collapsed wall and/or roof logs inside the confines of the foundation, though certainly not enough to reconstruct an entire cabin. Coldfoot 5, then, appears to have been a partially standing, partially wood-scavenged structure at the time it finally collapsed into the foundation. It seems, then, that it likely stood longer than any other excavated structure.

Tofty 1 is known through oral historical data to have been a partially scavenged, yet still standing structure prior the entire town site burning down in 1969. This structure remained essentially complete into the 1960s, when an unknown quantity of its elements were scavenged and transported away for re-use in another structure in a different location. In addition, Tofty 1 is located only a few meters off a wagon road that runs through this old town site, a road which traverses ca. 9 miles to Hot Springs (now Manley), the mining district's main supply town on a slough off the Tanana River. The chronology of datable artifacts from this foundation fits this historical scenario, with the artifacts dating conservatively between 1905 and 1965, and more-narrowly between 1925-65 (see Chapter 2, Figure 2.4).

Tofty 1 and Coldfoot 5, then, are the two excavated structures which exhibit evidence of partial, standing structures longer than the other excavated foundations. Tofty 1 we know was at least partially standing until 1969. Coldfoot 5 was likely the last (partially) standing structure in the old town site (excepting the two still-standing structures that were occupied into the 1950s, Coldfoot Features 23 and 24; see Chapter 2, Figure 2.2). Expectation #5 proposes that the longer a structure is left standing, the higher is its "scavengeability potential," that is, the more likely it is to attract continued delayed curation and be scavenged or looted for usable, *de facto* refuse. Refer back to Figures 3.2-3.5, which present each excavated feature's assemblages in terms of percentages of "usable" refuse (*de facto* refuse), "complete and non-usable" refuse (possibly provisionally discarded refuse), and "fragmentary and non-usable" refuse (primary, secondary, and non-usable abandonment refuse). Figure 3.2 shows Tofty 1 ("T.1") with very low percentages of both "usable" and "complete and non-usable" artifacts, and dominated by "fragmentary and non-usable" material. Aside from most of the excavated trash pits and the privy hole, Tofty 1 presents the least amount of usable refuge of all of the excavated features. This is consistent with the expectation, that is, an easily accessible (i.e., proximity to a traveled road) and long-standing structure, with very little usable refuse (<10% of total artifacts), and dominated by fragmentary, non-usable refuse (>80% of total artifacts). When cans and bottles are removed from consideration (see Figure 3.4), Tofty 1 further resembles the excavated trash pits, which are intentional deposits of discarded secondary refuse.

Feature 3.2 illustrates Coldfoot 5 grouping with other excavated structural foundations, in a "cluster" mid-way between the secondary refuse and privy features (Coldfoot 3, 6, 10, 11, 16) and Tofty 1, and the later-occupied Coldfoot 14 foundation and Wiseman 1 foundation ("W.1") (note: "cluster" here and below refers only to proximity in Figures 3.2-3.5, and does not refer in any way to mathematical cluster analysis). What is interesting about Coldfoot 5's assemblage, though, is that 77% (n=1202) of the artifacts from Coldfoot 5 derive from below the intact house floor, or were wedged between the floor boards (presented as "5 below flr." in Figures 3.3 and 3.5), with the remaining 23% of its artifacts (n=361) found on top of or in the general fill above the floor boards (presented as "5 fill"). Only the artifacts excavated from above the intact wooden floor, therefore, reflect any scavenging activities enacted upon this feature, as the artifacts from below the floor boards were hidden from view and were not susceptible to scavenging. When separated from the "below floor" assemblage, the Coldfoot 5 above-floor assemblage ("5 fill") drops dramatically in terms of percentage of "usable" artifacts and "complete and non-usable" artifacts, and in Figure 3.3 clusters with other scavenged foundations and Tofty 1. In Figure 3.5, when cans and bottles are removed from consideration, the Coldfoot 5 "fill" (above-floor assemblage) clusters with the secondary refuse trash pits. On the other hand, the refuse from below the floor of Coldfoot 5 ("5 below flr.") has much higher percentages of both "usable" and "complete and non-usable" items (Figure 3.3), directly reflecting the "hidden" (and hence non-curated and non-scavenged) nature of these artifacts. Together, both Tofty 1 and the Coldfoot 5 "fill" more closely resemble the secondary refuse trash pit features than other excavated foundations. The data from Coldfoot 5 and Tofty 1 corroborate the expectation that the longer buildings are left wholly or partially standing, the increased potential they have to accumulate primary and secondary refuse, with a concomitant percentage decrease in usable, *de facto* refuse.

Assemblage Spatial Considerations

Methods for Evaluating Expectations #6, #7, #8, #9

For present analytical purposes, we now define "large" as any artifact with a greatest dimension larger than or equal to 10 cm. This arbitrary division comes from Rathje's (1979:9-10) assessment that items less than ca. 9 cm have a greater potential to remain in activity areas and not undergo normal maintenance activities than do items larger than this size. Assuming the reasoning for this is at least partially due to hindrance avoidance, then the same reasoning will be used here.

Coldfoot 5 was the only excavated foundation with an intact wooden floor, and is thus inapplicable to Expectations #8 and #9. Neither does it have a subterranean cold storage box within its confines, thus, it is inapplicable to Expectation #6. Expectation #7 deals with structures with intact wooden floors; thus, of all of the excavated foundations, only Coldfoot 5 is applicable to this expectation. For these reasons, Coldfoot 5 is assessed separately, in Expectation #7, and is not included in discussions of the other spatial expectations. Tofty 1, too, is excluded from the "floor board" discussion related to Expectation #9. Although one section of *in situ* floor boards was present inside this foundation (see Appendix B, Figure B.7), it could not be determined whether scavenging of floor boards had occurred prior to the 1969 fire that destroyed the remainder of this structure, or whether the fire itself was responsible for the destruction of most of the floor boards. Expectation #8, again, addresses the question whether more artifacts than expected are located along the inner walls of a foundation relative to its interior space, in foundations that have had their floor boards dismantled. While this latter "dismantling" assumption cannot be conclusively met at Tofty 1, these data are still presented along with the other excavated foundations, for comparative purposes.

To assess these expectations, we need to determine if more artifacts than would otherwise be expected are located in cold storage cellars or boxes (Expectation #6), along sill logs (relative to "interior" of floor-removed foundations; Expectation #8), and on sections of remaining floor boards (relative to areas where floor boards have been removed; Expectation #9). Expectation #8 requires delimiting artifacts "alongside the walls" from those in the "interior" of foundations. Thus, those excavation units which overlapped the outer sill logs were counted as "wall" units, and their individual areas (in square meters) were added together and totaled. Artifacts from excavation units that overlapped the sill logs were totaled as artifacts "alongside the walls." Excavation units on the "inside" of foundations (i.e., not adjoining foundation sill logs) were likewise totaled in square meters, and their artifacts were designated as coming from the "interior" of the foundation.

The same excavation unit area totaling and artifact totaling were done separately for remnant sections of floor boards inside of excavated foundations, and contrasted with inner foundation areas where floor boards were removed for firewood (Coldfoot 1, 7, 14, Tofty 1, and Wiseman 1). This was done so that Expectation #8 could be evaluated, that is, determining if more artifacts are found on remaining floor board sections relative to areas of foundations where floor boards had been removed via scavenging. When contrasting "areas of remnant floor boards" versus "areas where floor boards had been removed," all non-floor board areas and associated artifact counts were added together (i.e., other "interior," "alongside the walls," and cellars/boxes).

Tables 3.3-3.4, thus, provide data regarding the numbers of artifacts, both total artifacts and numbers of artifacts with a greatest dimension larger than 10 cm, in three spatial sections of foundations: "alongside the foundation sills," in the "interior" of foundations, and in storage cellars/boxes. These are accompanied by estimated areal space, in square meters, of these three spatial divisions (note, some foundations do not have storage cellar/boxes). The foundations were all excavated using a 1 x 1 m. grid network over each foundation, and by natural layers. In two cases (Coldfoot 1 and Tofty 1) the grid was aligned with magnetic north, but in all other excavated foundations the excavation grid was aligned arbitrarily to conform with the trend of the foundation. Some excavation units were only partially excavated, those that overlapped the foundation sill logs. During excavation, after delineation of the sill logs, only the areas actually falling within a foundation were further excavated. As such, only that portion of a 1 x 1 m excavation unit that falls within the confines of a foundation was excavated, and ultimately from which artifacts were collected. Tables 3.5-3.6 provide total number of artifacts, and number of artifacts $\geq$10 cm, that were found on remnant floor boards sections of foundations. Areas of these floor boards were calculated. Likewise, numbers of artifacts and areas were counted inside of foundations where floor boards had been removed. These four tables, Tables 3.3-3.6, provide data necessary to assess Expectations #6, #8, an #9.

Expectation #6 requires delimiting the area of any cold storage boxes or cellars. These were easily computed, and their areas were subtracted from that foundation's total "interior" area (Coldfoot 1, 4, Tofty 1). Cold storage cellars or boxes were always excavated separately in the field as "sub-features" within a foundation, usually as a single entity or excavation unit, and their artifacts designated as deriving from that "sub-feature." In the case of Coldfoot 14, however, a 3 x 3 m. grid conforming to the rest of the foundation's excavation grid was maintained owing to the size of the cellar hole. Coldfoot 14 was the last excavated feature of the 1995 field season, and its large cold cellar was the last entity excavated. Unfortunately, this cold cellar was only partially excavated. Eight of the nine 1 x 1 m units of this cellar were excavated down to the floor joist and floor board section that had collapsed from above into this cellar-feature. The artifacts in the "above-collapsed-floor" fill obviously came into the cellar depression during or after the floor collapsed from above, and as such are counted in the "interior" and "alongside the walls" totals. Below this collapsed floor in the cellar, owing to lack of time only a 1.74 x 1.26 m area was removed and excavated down to the intact wooden floor of the cold cellar. Many artifacts were found directly upon this exposed section of cellar floor. As such, artifact totals for the remaining unexcavated Coldfoot 14 cold cellar (i.e., artifacts from below the collapsed floor, and on top of the cold cellar floor) have been extrapolated based upon the sample collected. A correlation of "sample size-to-excavated area" to "total artifacts-to-area of cold cellar" was used to perform this simple calculation.

Both total artifact number and artifacts $\geq$10 cm were tabulated per area of each foundation, that is, from the "interior," "alongside the walls", and from "cellars" and "remnant floor board sections" if applicable. From these data, the number of artifacts per square meter for each of these four spatial divisions of a foundation (interior, walls, cellar, floor sections) was tabulated (e.g., [total artifacts along walls ÷ area in square meters along the wall] = artifacts per square meter along the wall). The "interior," "walls," and "cellar" data are presented in Tables 3.3 and 3.4, and presented graphically in Figures 3.12-3.15, and the "remnant floor boards" data are presented in Tables 3.5 and 3.6, and presented in Figures 3.16-3.19. Like the rest of the "Evaluation" section of this chapter above, the Wiseman 1 data are presented both with and without the "bead bag" count (n=1253 beads, or n=1 bag of beads), which was located in an "interior" unit of the Wiseman 1 foundation.

Evaluation of Expectation #6

Again, this expectation predicts that "Subterranean cold storage cellars or boxes will receive a disproportionate amount of refuse relative to their overall size (whether via cultural or natural means, or both)." Subterranean cold cellars or boxes are expected to receive a disproportionate amount of refuse in scavenged foundations, owing to the expected relaxation of maintenance activities in abandoned structures, and the availability of a "safe" subterranean disposal area to deposit refuse. However, this expectation is <u>not</u> wholly supported by the archaeology data. Figure 3.12 presents the number of artifacts per square meter that occur in the "interior," "alongside the walls," and inside of a storage cellar or box, for each of the excavated foundations. The foundations which had their cold

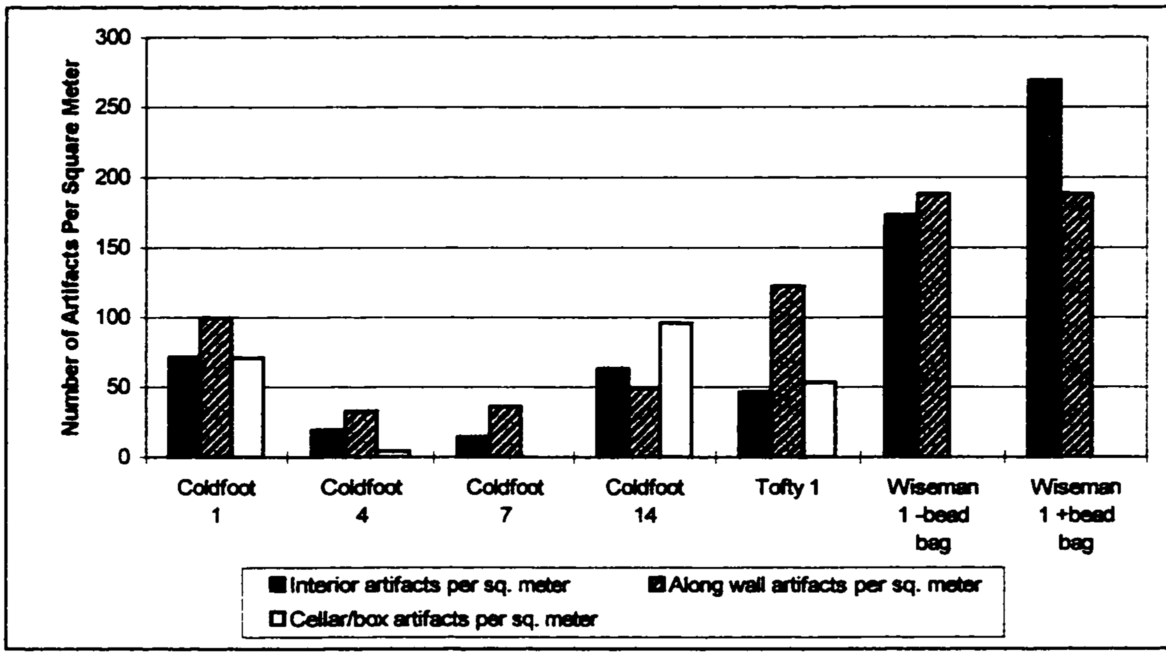


Figure 3.12 Numbers of all artifacts per square meter in the "interior," alongside the wall or sill logs, and in storage cellars or boxes of excavated structural foundations. Note general pattern of more artifacts along walls, and less in the "interior" and storage units.

storage cellar or box excavated are Coldfoot 1, 4, 14, and Tofty 1. Wiseman 1's cellar was not excavated due to hazardous material within it. Figure 3.12 indicates that cold storage boxes in Coldfoot 1 and Coldfoot 4 actually have disproportionately less refuse in them per square meter, relative to the rest of the foundation. Tofty 1 had roughly the same amount of refuse in its cellar box per square meter as the "interior" excavation units of the foundation, and Coldfoot 14 had relatively greater amounts of refuse in its cellar than the rest of its foundation.

Figure 3.13 presents how far the actual numbers of artifacts per square meter deviate from "expected" (in terms of percent) for the "interior," "alongside the walls," and inside of a storage cellar or box, for each of the excavated foundations. The "expected" artifact count for each foundation was calculated by dividing the total number of artifacts inside of an excavated foundation by its total area. This provided an "expected" number of artifacts per square meter for that foundation. The "actual" number of artifacts per

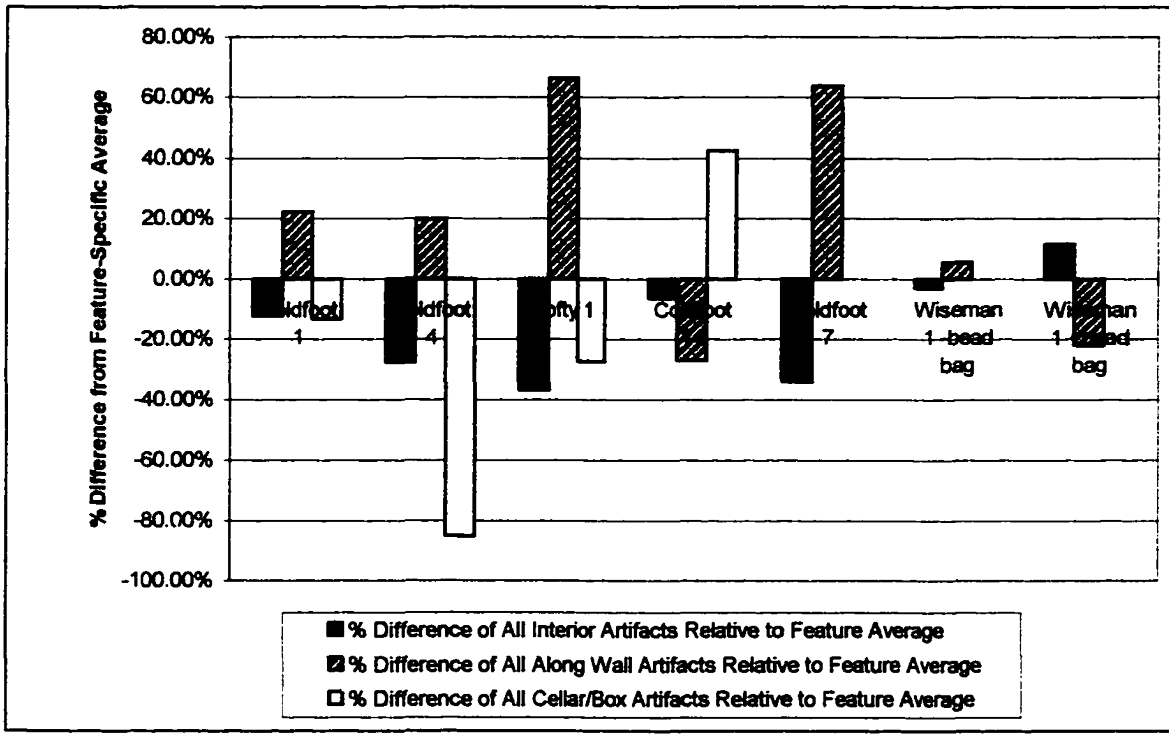


Figure 3.13 Percent difference from "expected" number of artifacts per square meter in the "interior," alongside the wall or sill logs, and in storage cellars or boxes of excavated structural foundations. Note general pattern of more artifacts than expected along walls, and less in the "interior" and storage units.

square meter for the "interior," "alongside the walls," and inside of a storage cellar or box for each excavated foundation was then divided by its "expected" frequency, to determine if the "actual" either conformed to the "expected" (0%, no deviation above or below expected), was more than expected (any positive percentile), or less than expected (any negative percentile). Numerical data are presented in Table 3.3. Again, when viewing Figure 3.13, it should be remembered that only Coldfoot 1, 4, 14, and Tofty 1 have cold storage boxes or cellars.

Figure 3.13 indicates that three of the four excavated foundations with cold storage units had fewer artifacts per square meter than was expected for them, and that Coldfoot 4 deviated most negatively from expectation. The sole exception was the

Coldfoot 14 foundation. This foundation was also the only excavated foundation that had a disproportionately greater number of artifacts per square meter in its cellar than was expected. The Coldfoot 14 cold cellar, again, was more than a simple box-like feature placed into the ground (as per Coldfoot 1, Coldfoot 4, and Tofty 1), but instead comprised circa 9 m2 and underlay roughly 30% of the spatial extent of its foundation. Similar cellars are found today in standing structures in Wiseman, in some instances underlying the entire foundation of a cabin, and are typically accessed by a trap door. The only comparable feature at the Coldfoot town site is the unexcavated feature Coldfoot 2 (see Chapter 2, Figure 2.2). While the smaller subterranean boxes of Coldfoot 1, Coldfoot 4, and Tofty 1 were apparently not used much for secondary refuse disposal as proposed in Expectation #6, Coldfoot 14's cellar owing to its much larger size was likely a more tempting depository for trash by both curators and later scavengers, and hence contains a disproportionately large amount of trash upon its floor.

Evaluation of Expectation #7

Again, this expectation predicts that "In structures undergoing gradual and planned abandonment, resulting refuse deposited on the floor will form clusters as maintenance and routine clean-up activities cease. Such clustering patterns should be evident on intact floor surfaces." Only a single excavated foundation, Coldfoot 5, had an intact wooden floor. All of the other excavated foundations were missing all or most of their floor boards. No remaining furniture (e.g., chairs, tables, beds, etc.) was located in this, nor any of the other excavations. Coldfoot 5 presented apparent "clustering" in some excavation units, and the absence or near-absence of artifacts in other units (note: again, no mathematical cluster analysis was used here when referring to "clusters"). These data seem to corroborate the expectation. However, large percentages of some of the "clusters" consist of nails and window glass, both possibly relating to collapsed architectural features and not to abandonment processes. Besides, window glass is a

Table 3.3 Summary of excavated foundations's artifactual spatial data ("Interior," "Alongside Sill Logs," & Storage Cellar/Boxes). See Figures 3.12 and 3.13. CF= Coldfoot, T= Tofty, W= Wiseman. Numbers rounded to nearest whole number.

	CF1	CF4	CF5	CF7	CF14*	T 1	W 1**	W 1***
# of interior artifacts	1843	77	119	229	942	929	3498	2245
interior area (m^2)	26	4	4	16	15	20	13	13
# of artifacts along sill logs	1557	213	136	302	517	1450	1287	1287
area along sills (m^2)	16	7	6	9	11	12	7	7
# of artifacts in cellar/box	55	1	NA	NA	862	96	NA	NA
cellar/ box area (m^2)	0.8	0.3	NA	NA	9	2	NA	NA
# of interior artifacts/m^2	71	20	30	14	63	47	269	173
# of sill log artifacts/m^2	99	33	24	35.5	49	122	188	188
# cellar/box artifacts/m^2	71	4	NA	NA	96	53	NA	NA
total # of artifacts in feature	3455	291	255	531	2321	2475	4785	3532
total area of feature (m^2)	42	11	10	25	35	34	20	20
"Expected" # of artifacts for feature (total #/total area)	81	27	27	22	67	74	241	178
difference btwn Expected & Interior artifacts/m^2	-10	-8	3	-7	-4	-27	28	-5
% difference btwn Expected & Interior artifacts/m^2	-12%	-28%	12%	-34%	-7%	-37%	12%	-30%
difference of Expected from sill log artifacts/m^2	18	5	-2	14	-18	49	-53	10
% difference btwn Expected & sill log artifacts/m^2	22%	20%	-9%	64%	-27%	66 %	-22%	6%
difference btwn Expected & cellar/box artifacts/m^2	-11	-23	NA	NA	29	-20	NA	NA
% difference btwn Expected from cellar/box artifacts/m^2	-13%	-85%	NA	NA	43%	-28%	NA	NA

*Coldfoot 14 cold cellar numbers estimated from excavated sample.

** Wiseman data with "bead bag" (n=1253 beads) from interior.

*** Wiseman data without "bead bag" (n=1253 beads) from interior.

highly breakable artifact type that can artificially inflate artifact counts, thus creating "clusters" of artifact counts where none may otherwise exist. It may also be that the floor size, <10 m^2, is not large enough for distinct "clusters" of refuse to be recognized (i.e., most of the floors in Stevenson's analysis ranged ca. 10-36 m^2; 1982: Figures 2, 5, 6), or else the excavation units used in this analysis (1 x 1 m) are too large to appropriately distinguish "clusters" of artifacts.

With this in mind, the overall, general pattern of the above-floor Coldfoot 5 artifact assemblage is that artifacts, of whatever size, are located away from the doorway and the "front" (northern) wall, and concentrating instead towards the "rear" (southern) side of the structure. Such distributions may result from foot travel, where artifacts, particularly large artifacts, have been reduced in number in the immediate vicinity of the doorway by being placed or kicked aside. With only one structure available with an intact floor, a more thorough evaluation of this Expectation is not presently possible.

Evaluation of Expectation #8

Again, this expectation predicts that "During structural and floor dismantling, refuse (especially "larger" refuse) will tend to congregate away from the central areas of rooms and alongside the walls." To assess this expectation, we refer back to Figures 3.12-3.13. Figure 3.12, again, presents for each of the excavated foundations the numbers of artifacts per square meter in the "interior" units, "alongside the walls" units, and for any cold storage cellar and boxes. When all artifacts are examined regardless of size, three of the four excavated foundations from Coldfoot (Coldfoot 1, 4, 7) contained more artifacts per square meter along their sill logs than from their interiors (Figure 3.12), thus conforming to the expectation. Tofty 1 also had many more artifacts per square meter along its foundation sill logs than in its interior. It must be remembered, however, that the assumption of scavenging of floor boards required of this expectation is not met by the Tofty 1 foundation. However, the data presented in Figure 3.12 (and Figure 3.13) illustrate that Tofty 1 had the highest contrast between values of "interior" artifacts versus "alongside the wall" artifacts of any of the excavated foundations. These data could be used to argue that Tofty 1, too, had much its floor boards scavenged prior to its 1969 fire. Wiseman 1 too joins this category (i.e., more artifacts per square meter along the sill logs than in the interior) when the "bead bag" (n=1253 seed beads) is counted as one artifact, yet does not when the beads are counted individually. Coldfoot 14, on the other hand, is the only excavated foundation where there were actually more artifacts per square meter in the interior of its foundation than alongside its foundation sill logs. The apparent reason for this relates to the relative number of artifacts found inside its large subterranean cold cellar, and is explained next.

Figure 3.13, again, illustrates the percent difference from "expected" for the "actual" artifact counts per square meter of each spatial division (interior; walls; cellar/box), for each of the excavated foundations. These data indicate that in Coldfoot 1, Coldfoot 4, Coldfoot 7, and Tofty 1, more artifacts per square meter than expected were found alongside the foundation sill logs, and that less than expected were found in the interior of these foundations. Excepting Wiseman 1 (explained next), Coldfoot 14 was the only excavated foundation where less artifacts than expected were located alongside the foundation sill logs, and is thus in apparent contradiction to the expectation. Figure 3.13 shows that Coldfoot 14 artifacts both in the "interior" and "alongside the foundation sills" were less than expected. We see, however, that the number of artifacts from the cellar floor was more than 40% above expected. As discussed previously, of all of the excavated subterranean storage facilities, the Coldfoot 14 large cellar was apparently the only storage feature utilized as a secondary refuse receptacle upon abandonment. It is proposed here that artifacts on top of the Coldfoot 14's scavenged floor boards were preferentially deposited (intentionally?) into the cellar, as opposed to ending up alongside the foundation sill logs during floor board removal. The cellar's large size may well have been too obvious or too tempting to resist depositing refuse into when the floor was being scavenged.

Like Coldfoot 14, Wiseman 1 did not conform to the patterning found among the other floor-scavenged foundations (i.e., more artifacts than expected were found alongside the foundation sill logs than in the interior). This was the situation whether the 1253 seed beads in the "bead bag" in the interior of this foundation were counted separately or not. Several anomalies between this foundation and the others may account for this discrepancy: (1) This foundation was only partially excavated. If the foundation was fully excavated, perhaps all of the data taken together would conform to the "more-alongside-the-walls" expectation. (2) A very large ca. 4 x 4 m cold cellar dominates the northern and central areas of this foundation, which was not excavated owing to potentially hazardous material. Perhaps this cellar was used as a readily available trash receptacle during floor removal, as was suggested for Coldfoot 14, above. (3) The Wiseman 1 foundation confines can be divided into at least two rooms, a larger "habitation room" and an adjoining side "shed" or overhang, based upon distinct floor joists, distinct outer foundation sills, and distinct dimensions and characteristics of floor boards (see Appendix B, Figure B.8). If a wall was present between these two rooms when most of the floor boards from the "habitation room" were removed, it too could have served as a barrier to artifact movement in the same way as proposed for the outer foundation sills. If so, then artifacts on either side of this inner wall (since removed) should too be counted as "alongside the walls," which in the present analysis they are not (Tables 3.3-3.4; Figures 3.12-3.14). (4) And the last potential reason to explain the discrepancy of the Wiseman 1 spatial data relative to the other excavated foundations was that the floor of this foundation (Wiseman 1) was only partially dismantled. The floor of the "shed" portion of this foundation was left entirely intact, and, as discussed above, contained on it a large concentration of material goods. It was further suggested in the "Formulation of the Archaeological Expectations" section of this chapter that wooden structures dismantled for firewood could be (a) dismantled all at once, or else (b) dismantled gradually through time. If the latter process was the case for Wiseman 1, then a concentration of material goods away from the area of floor dismantling and onto the remaining undismantled floor boards may have occurred. As the excavation of this foundation illustrated, no one came back for the remaining sections of floor boards. If this last, fourth, reasoning is valid, then the discrepancy between the Wiseman 1 spatial data and the other excavated foundations with dismantled floor boards (Coldfoot 1, 4, 7, Tofty 1, and possibly Coldfoot 14; see Figures 3.12-3.13), is that these latter foundations's floors were dismantled almost entirely and all at once, whereas the Wiseman 1 foundation reflects only a partial or sequential dismantling.

One final aspect of Expectation # 8 remains. Owing to hindrance avoidance, it was expected that of all the artifacts displaced during floor board removal, "larger" items especially would end up alongside foundation sill logs. Again, a "large" artifact is here defined as one having a largest dimension greater than 10 cm (c.f. Rathje 1979:9-11). Figure 3.14 and Table 3.4 present the numbers of artifacts >10 cm per square meter in the "interior" units, the units "alongside the walls," and for any cold storage cellar and boxes for each of the excavated foundations. Figure 3.14 illustrates, that, without exception, all excavated foundations in this study that had their floor boards scavenged conform to the expectation of more artifacts per square meter alongside the sill logs than in their interiors (although Wiseman 1's values of "interior" and "walls" were not that far removed from each other). Figure 3.15 illustrates the amount of >10 cm artifacts per square meter for each of the three spatial areas (interior; walls; cellar/boxes) per foundation, in terms of percentages that each was above or below the "expected" number for that foundation. According to this figure, all foundations from all three sites have more "large" artifacts alongside their foundation sill logs than expected, and they all have lower than expected amounts of "large" artifacts in their interiors. It should be noted, though, that the Coldfoot 14 "wall" artifacts, and both "interior" and "wall" artifacts from the Wiseman 1 foundation, all varied less than 7% from expectancy.

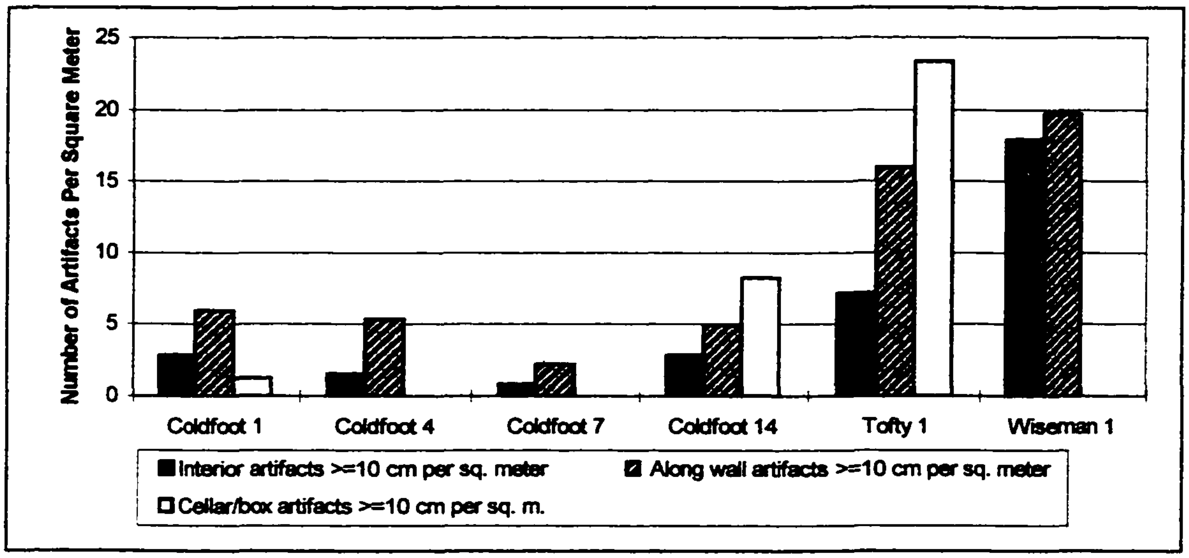


Figure 3.14 Numbers of artifacts ≥10 cm per square meter in the "interior," alongside the sill logs, and in storage cellars or boxes of excavated foundations. Note consistent pattern of more artifacts ≥10 cm alongside sill logs than in the interior of foundations.

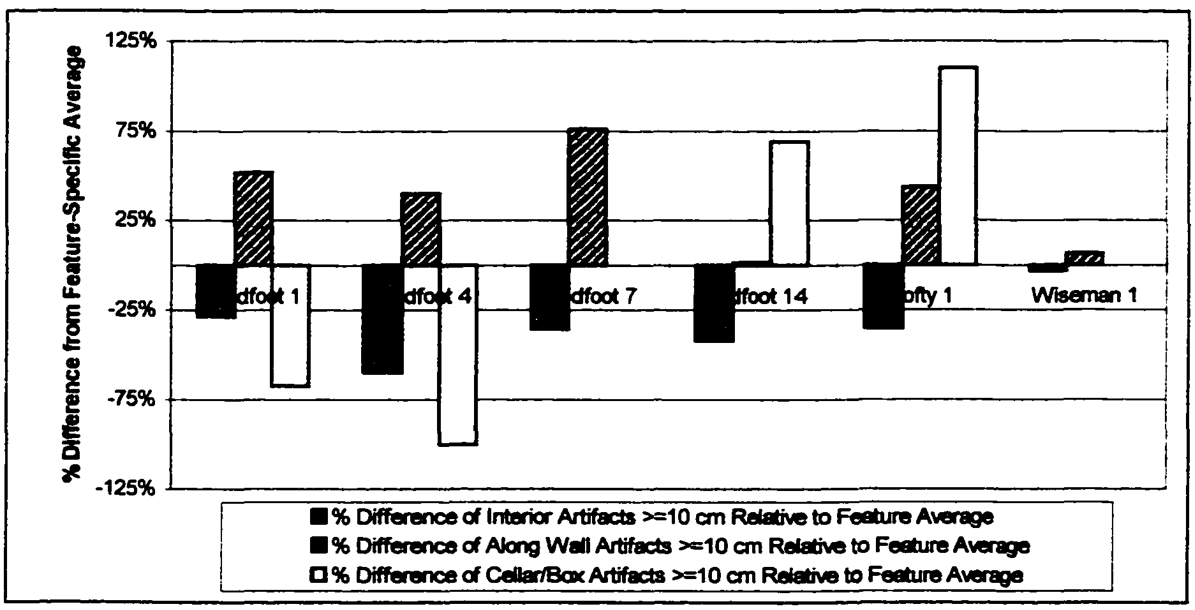


Figure 3.15 Percent difference from "expected" number of artifacts ≥10 cm per square meter in the "interior," alongside the wall or sill logs, and in storage cellars or boxes of excavated structural foundations. Note consistent pattern of more artifacts than expected along walls, and less in the "interior."

Table 3.4 Summary of excavated foundations's spatial data of artifacts ≥10 cm ("Interior," "Alongside Sill Logs," & Storage Cellar/Boxes). See Figures 3.14 and 3.15. CF= Coldfoot, T= Tofty, W= Wiseman. Numbers rounded to nearest whole number.

	CF1	CF4	CF5	CF7	CF14*	T 1	W 1
# of interior artifacts ≥10cm	72	6	6	13	42	143	233
area of interior (m^2)	26	4	4	16	15	20	13
# of sill log artifacts ≥10cm	93	35	16	19	52	189	135
area along sill logs (m^2)	16	7	6	9	11	12	7
# of cellar/box artifacts ≥10cm	1	0	NA	NA	74	42	NA
cellar/box area (m^2)	0.8	0.3	NA	NA	9	2	NA
# of interior ≥10cm artifacts/m^2	3	2	2	0.8	3	7	18
# of sill log ≥10cm artifacts/m^2	6	5	3	2	5	16	20
# of cellar/box ≥10cm artifacts/m^2	1	0	NA	NA	8	23	NA
total # of artifacts per feature	166	41	22	32	168	374	368
total area of feature (m^2)	42	11	10	25	35	34	20
"Expected" # of >10cm artifacts for feature (total #/total area)	4	4	2	1	5	11	19
difference btwn "Expected" # >10 cm artifacts & interior artifacts/m^2	-1	-2	-0.8	-0.5	-2	-4	-0.6
% difference btwn "Expected" # >10 cm artifacts & interior artifacts/m^2	-29%	-60%	-34%	-36%	-42 %	-36%	-3%
difference btwn "Expected" # >10 cm artifacts & sill log artifacts/m^2	2	2	0.6	1	0.1	5	1
% difference btwn "Expected" # >10 cm artifacts & sill log artifacts/m^2	52%	40%	25%	76%	1%	43%	6%
difference btwn "Expected" # >10 cm artifacts & cellar/box artifacts/m^2	-3	-4	NA	NA	3	12	NA
% difference btwn "Expected" # >10 cm artifacts & cellar/box artifacts/m^2	-67%	-100%	NA	NA	69%	110%	NA

*Cold cellar numbers estimated from excavated sample.

Evaluation of Expectation #9

Again, this expectation predicted that "There is an enhanced possibility of larger accumulations of refuse on remaining intact and *in situ* sections of dismantled floors relative to those areas where floor boards have been removed, especially if such floor sections are not centrally located inside a foundation." The expectation proposes more refuse on remaining, intact floor board sections than areas where floor boards had been removed, especially if such floor boards are in out-of-the-way or peripheral locations, that is, along the walls or in corners and not in more centrally located areas. The reasoning for this, again, was related to hindrance avoidance during structure and floor dismantling. If a structure and/or floor were torn apart all at once, artifacts lying upon the wooden floor would be expected to congregate towards the foundation sill logs, or else end up entirely outside of the foundation. If on the other hand, a floor were removed over an *extended* period of time, then in addition to these two possibilities (items intentionally removed to the outside of a foundation, and items congregating along sill logs), items might also merely be placed or piled up temporarily on a section of the floor not presently being dismantled, preferably out of the way of foot travel.

Besides the intact floor in Coldfoot 5, four of the other excavated foundations had remnant sections of *in situ* floor boards, including: (1) half of Coldfoot 1's northern room or "shed" (see Appendix B, Figure B.1), (2) the eastern portion of Wiseman 1's foundation (including the entire "shed"-like structure and portions of two adjoining excavation units in the "habitation room;" see Appendix B, Figure B.8), (3) a small section of floor boards in Coldfoot 7 discovered intact beneath a thick first wall log that had been displaced from the eastern wall (see Appendix B, Figure B.5), and (4) a section of floor boards in Coldfoot 14, including a large section that had collapsed into its large cold cellar from above, as well as a small section connected to this collapsed section which remained above (see Appendix B, Figure B.6). In order to conform to the "intact, *in situ*" aspect of this expectation, only the intact, non-collapsed portion of Coldfoot 14's floor boards was included in the present analysis, and not the larger section that had collapsed downward into its large cold cellar. Tables 3.5-3.6 present the numerical data on numbers of artifacts per square meter associated with *in situ* floor boards sections in these four foundations, relative to areas where floor boards have been removed. Table 3.5 provides these data for all artifacts, and Table 3.6 for only those artifacts ≥10 cm. Like Tables 3.3-3.4 above, Tables 3.5-3.6 also provide the "expected" number of artifacts per square meter of each foundation, and the percent differences from this "expected" value of the "actual" numbers of artifacts per square meter from the floor board and non-floor board areas. These numerical data are illustrated graphically in Figures 3.16-3.19.

The floor board sections of Coldfoot 1 and Wiseman 1 are peripheral, away from the center of the foundation, with Coldfoot 1's floor section at the northern edge of a long, linear feature (see Appendix B, Figure B.1), and Wiseman 1's situated along one side of an otherwise large foundation (see Appendix B, Figure B.8). Coldfoot 7's remnant floor board section, too, can be regarded as peripheral in the southeastern corner of the foundation, immediately to the right of the doorway (see Appendix B, Figure B.5). Feature 14's remnant section, however, is *not* peripheral but instead largely centralized, jutting into the center of the room (see Appendix B, Figure B.6).

The data, as illustrated in Figures 3.16-3.17 for all artifacts, and Figures 3.18-3.19 for those artifacts ≥10 cm, conform to the expectation. We see that the peripheral floor board sections in Coldfoot 1, Coldfoot 7, and Wiseman 1 (both with and without the "bead bag" for this latter foundation) have more artifacts per square meter than their non-floor board areas (Figures 3.16-3.17), and <u>especially</u> so for artifacts ≥10 cm (Figures 3.18-3.19).

While the large concentrations of artifacts encountered in the "shed" features of Coldfoot 1 and Wiseman 1 were readily apparent during excavation (see artifact totals in these areas in Tables 3.3-3.6), the extent of relative numbers of artifacts on Coldfoot 7's small peripheral floor board section did not become apparent until this analysis.

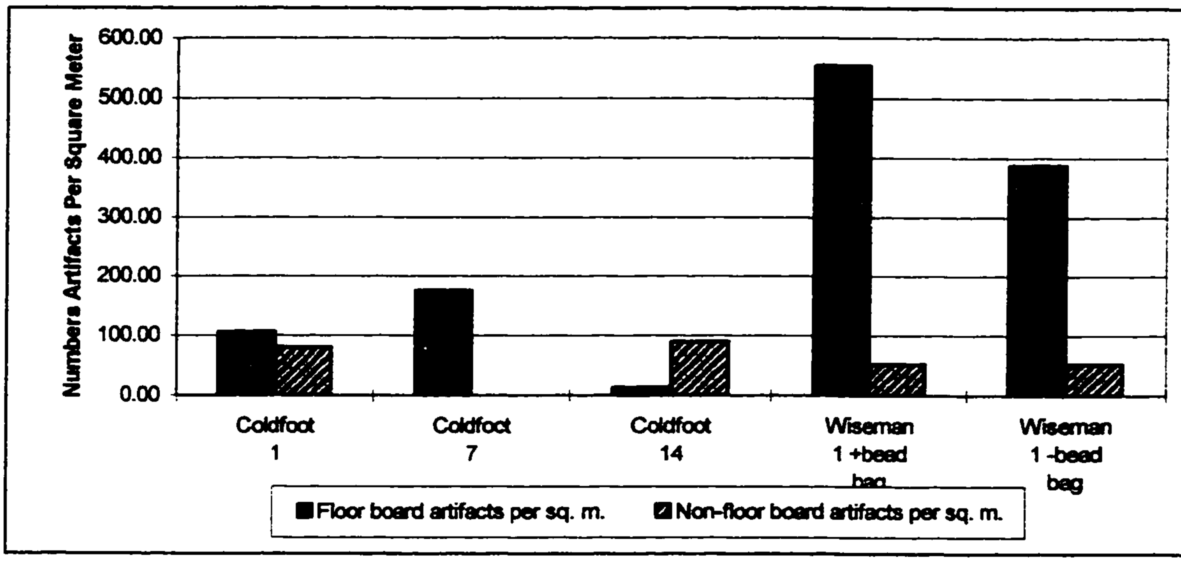


Figure 3.16 Number of artifacts per square meter found on *in situ* remnant floor boards, and in areas where floor boards have been removed by scavengers. Note general pattern of more artifacts found on remnant floor boards section than in scavenged areas.

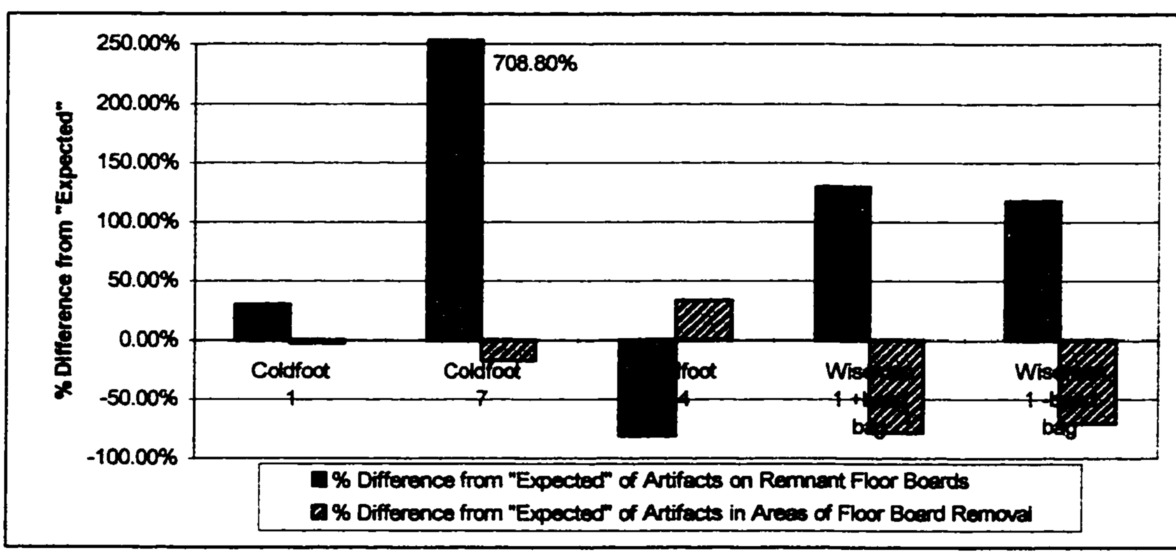


Figure 3.17 Percent difference from "expected" number of artifacts per square meter found on *in situ* remnant floor boards, and in areas where floor boards have been removed by scavengers. Note general pattern of more artifacts found than expected on remnant floor boards section and less than expected in scavenged areas.

Table 3.5 Summary of excavated foundations's spatial data of artifacts on *in situ* floor boards and where floor boards have been removed ("Interior," "Alongside Sill Logs," & Storage Cellar/Boxes). See Figures 3.16 and 3.17. CF= Coldfoot, T= Tofty, W= Wiseman. Numbers rounded to nearest whole number.

	CF1	CF7	CF14*	W1**	W1***
# of artifacts on floor boards	328	101	21	4151	2898
area of floor boards (m2)	3	0.6	2	8	8
# of artifacts where floor boards have been removed	3127	430	2300	634	634
area where floor boards have been removed (m2)	40	24	33	12	12
# of floor board artifacts/m2	106	176	13	553	386
#of artifacts where floor boards have been removed/m2	79	18	90	51	51
total # of artifacts in feature	3455	523	2321	4785	3532
total area of feature	42	25	35	20	20
"Expected" # of artifacts/m2 (total #/total area)	81	21	67	241	178
difference btwn Expected & floor board artifacts/m2	24	154	-54	312	208
% difference btwn Expected & floor board artifacts/m2	30%	709%	-81%	130%	117%
difference btwn Expected & where floor boards have been removed artifacts/m2	-2	-4	22	-190	-127
% difference btwn Expected & where floor boards have been removed artifacts/m2	-2%	-17%	33%	-79%	-71%

* Floor boards in Coldfoot 14Squares 4, 11, and 18 only. Data on non-horizontal floor boards in cold cellar not available. Also, non-floor board counts include estimated cold cellar counts.

** Wiseman 1 with "bead bag" (n=1253 beads) from interior.

*** Wiseman 1 without "bead bag" (n=1253 beads) from interior.

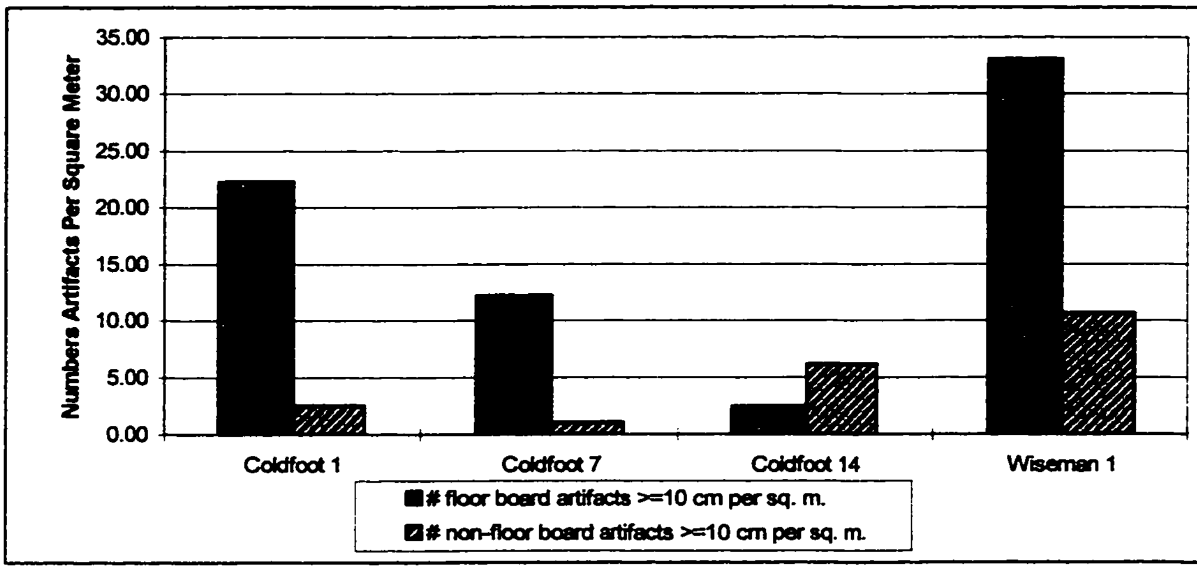


Figure 3.18 Number of artifacts ≥10 cm per square meter found on *in situ* remnant floor boards, and in areas where floor boards have been removed by scavengers. Note general pattern of more artifacts found on remnant floor boards section than in scavenged areas.

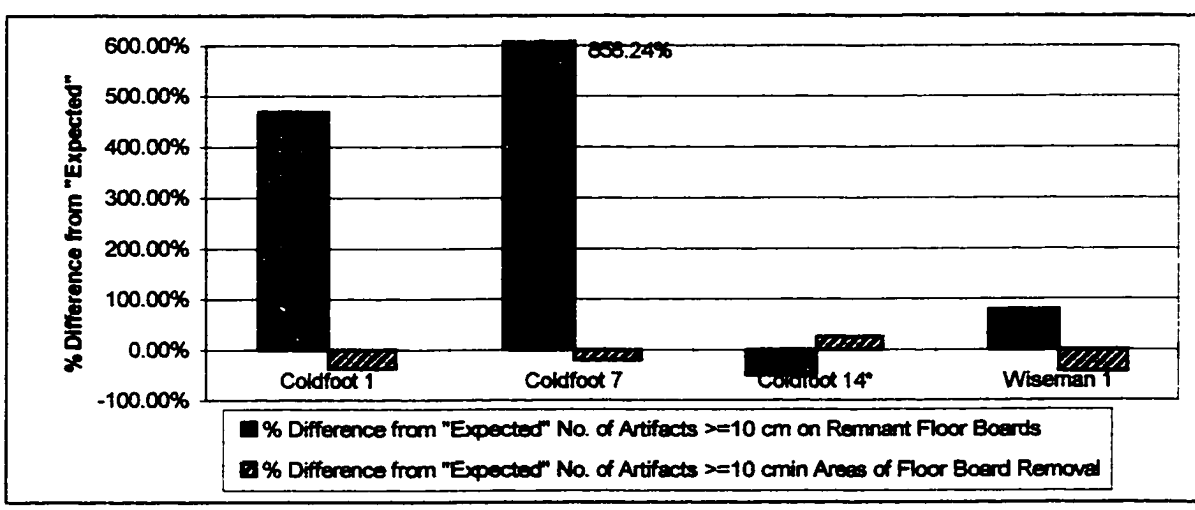


Figure 3.19 Percent difference from "expected" number of artifacts ≥10cm per square meter found on *in situ* remnant floor boards, and in areas where floor boards have been removed by scavengers. Note general pattern of more artifacts found than expected on remnant floor boards section and less than expected in scavenged areas.

Table 3.6 Summary of excavated foundations's spatial data of artifacts ≥10 cm on *in situ* floor boards and where floor boards have been removed ("Interior," "Alongside Sill Logs," & Storage Cellar/Boxes). See Figures 3.18 and 3.19. CF= Coldfoot, T= Tofty, W= Wiseman. Numbers rounded to nearest whole number.

	CF1	CF7	CF14*	W1
# of artifacts on floor boards ≥10cm	69	7	4	248
area of floor boards (m2)	3	0.6	2	8
# of artifacts ≥10cm where floor boards have been removed	96	24	158	129
area where floor boards have been removed (m2)	39	24	33	12
# of ≥10cm floor board artifacts/m2	22	12	2	33
# of ≥10cm artifacts where floor boards have been removed/m2	2	1	6	10
total # of ≥10cm artifacts in feature	165	31	162	377
total area of feature	42	25	35	20
"Expected" # of ≥10 cm artifacts/m2 (total #/total area)	4	1	5	19
difference btwn Expected & floor board ≥10 cm artifacts/m2	18	11	-2	15
% difference btwn Expected & floor board ≥10 cm artifacts/m2	469%	858%	-50%	78%
difference btwn Expected & where floor boards have been removed ≥10 cm artifacts/m2	-1	-0.3	1	-8
% difference btwn Expected & where floor boards have been removed ≥10 cm artifacts/m2	-38%	-21%	26%	-44%

* Floor boards in Squares 4, 11, and 18 only. Data on non-horizontal floor boards in cold cellar not available. Also, non-floor board counts include estimated cold cellar counts.

Comprising a total area of only ca. 0.5752 m^2, the small section of *in situ* floor boards in the corner of Coldfoot 7 had 101 total artifacts upon it, seven of which were ≥10 cm. In contrast, the entire rest of the foundation (ca. 23.9248 m_2) had 431 artifacts, 24 of which were ≥10 cm. This small floor section contained greater than 700% more artifacts than expected, and greater than 850% more artifacts in the ≥10 cm size range than was expected.

It is also interesting to contrast the concentrations of artifacts on the "shed" floors of Coldfoot 1 and Wiseman 1, in terms of assemblage variability. Although both concentrations likely indicate abandonment of provisionally discarded refuse, a closer contrasting examination of their contents reveals interesting differences between these two concentrations. In terms of both total numbers of artifacts and numbers of "large" artifacts (≥10 cm), the Wiseman 1 foundation exceeds in quantity that of Coldfoot 1 (Figures 3.16-3.18). However, in terms of "expected" percentage of ≥10cm artifacts, the Coldfoot 1 foundation contained six times as many "large" artifacts per square meter on its remaining *in situ* floor boards as did its Wiseman 1 counterpart (Figure 3.19). The reason for this is not clear.

Finally, Coldfoot 14's floor boards did not contain relatively more artifacts on its remnant floor boards (relative to areas of floor board removal; Figures 3.16-3.19). However, this was expected. Coldfoot 14 remnant floor section conformed to expectations because it was the <u>only foundation where the floor board section was in a centralized locale</u>, that is, not peripheralized along a wall or in a corner. As such, it was not expected to contain greater amounts of refuse upon it, owing to hindrance avoidance.

Summary Of Spatial Abandonment Evaluations

The expectation (Expectation #6) that more refuse would be found in subterranean cold storage features relative to the rest of a foundation was not wholly corroborated. While it was anticipated that all of these subterranean storage features would be used as refuse receptacles when regular maintenance and clean-up routines inside of foundations ceased, only the much larger cellar in Coldfoot 14 appears to have been used in this way.

The smaller box-like features in Coldfoot 1, Coldfoot 4, and Tofty 1 actually have less refuse per square meter in them than anticipated. The expectation (Expectation #7) regarding clustering of refuse on the floors of gradually abandoned structures could be assessed against only one excavated foundation, Coldfoot 5. Despite, or perhaps because of its small size, the data indicate only a general concentration of materials towards the rear of the structure, away from the northern, door side of the foundation. This limited sample, while suggestive, cannot be used alone to assess the validity of the expectation. More structures abandoned under gradual conditions with intact floors need to be assessed in order to provide further comment on this matter.

Most of the foundations had more artifacts along their foundation sill logs per square meter than were found in the interior of the structures, thus conforming to Expectation #8. When "large" artifacts ($\geq$10 cm) were examined separately, all of the excavated foundations conformed to the expectation that materials end up, either deliberately or accidentally, along the inner side of the foundation sill logs. When viewed in terms of percentages above or below an "expected" value of artifacts per square meter for each foundation, all excavated structures had more artifacts than expected along their foundation sill logs, and less than expected in their interiors. When remnant floor boards sections were examined in those foundations that had most of their floors scavenged and removed (Expectation #9), it was found that there were more artifacts (especially larger-sized artifacts) on the floor sections that in those areas of the foundations where the floor had been removed. In accordance with the expectation, this occurred when the remnant floor sections were found in peripheral areas in the foundations, and not when these floor sections were located in more central areas of the foundation.

ABANDONMENT AS A SOURCE OF ARCHAEOLOGICAL VARIABILITY: A SUMMARY

One of the goals of archaeology is to elucidate distinct processes and their effects upon artifacts in the archaeological record, both in terms of artifactual content and the spatial arrangement of those artifacts. Archaeology at historic sites is particularly suited. In this chapter I examine processes relating to abandonment of structures and settlements at three early twentieth century historic mining settlements in interior Alaska. Historical data relating to the specific abandonment scenarios of these three town sites, Coldfoot, Tofty, and Wiseman, and in some instances specific foundations, were available from historic documents, photographs, and oral history. In short, it was seen that Coldfoot, Tofty, and Wiseman's excavated structures represented examples of gradual, planned abandonment, where opportunities for long-term curation and subsequent scavenging of usable materials and raw materials were prevalent. The available archaeological abandonment literature provides examples of settlements and structures abandoned under similar contextual conditions, and the basis for formulating a series of nine archaeological abandonment expectations. Each expectation was evaluated against the excavated structures and other features from Coldfoot, Tofty, and Wiseman.

Most of the expectations presented above in this chapter were corroborated by the archaeological data. However, some of the expectations were only partially, or else not at all, corroborated. This of course is expected whenever one deals with open cultural systems, where it is often not possible to control for every contextuall-specific human and natural environmental agent and variable. The ambiguity reflected between "expected" models and predictions, and "actual" archaeological and historical data then needs to be assessed in terms of criteria specific to each particular historical setting. Thus, by assessing generalized expectations against specific historical and archaeological data, a more complete historical explanation is possible that takes into account processes and variables operating at different spatial and temporal scales. For the most part, this chapter focused upon an archaeological data set, at feature-level and site-level scales of analysis. Although the overall approach is similar in the following Chapters 4 and 5 (i.e., generalized expectations derived from historical data sets assessed or evaluated against a particular historical setting), the scales of analysis are different, and the evaluative data set is largely historical, not archaeological. Taken together (archaeological and historical data sets; different temporal and spatial analyses), such an approach will hopefully will lead to a more comprehensive understanding of the processes, both large-scale and small-scale, general and particular, which affected human decision-making at particular sites and structures, through time, across the landscape of interior Alaska.

CHAPTER 4

FORMULATING A GENERAL DEPENDENCY MODEL FOR AN EARLY PLACER GOLD MINING SETTLEMENT SYSTEM

In this chapter I shift focus away from the feature scale towards settlement. local (e.g., mining district), and ultimately regional (e.g., Alaska) scales of analysis. Whereas in Chapters 2 and 3 the focus was primarily upon archaeological data, in this chapter the focus shifts towards historical and geographical data, in order to develop a model for early placer gold mining settlement systems. This is intentional; archaeologists seek to explain not only the artifactual compositions of individual sites, but why sites are arranged and patterned on the landscape, and how they are linked in a larger system of interaction. Historic archaeologists researching late-nineteenth and early-twentieth century mining in Alaska need, at least in part, to regard their sites as individual components within a much larger interlocked system of an economic extractive industry. Such a larger system, however, was subject to equally important social, political, ecological, ideological, etc. processes and variables. Any one of these different processes may act at different temporal and spatial scales, and affect the decisions made at individual sites within this larger interlocked system. To understand the role that one site (e.g., Coldfoot, Tofty, Wiseman), or even one feature, played within larger Alaskan, national, and even global systems, one needs to understand not only those variables and processes that act at the smaller feature and site-level scales, but also those that operate at such larger scales of analysis.

The method employed here begins with inductive generalization from comparative analyses. The assumption is that similar processes at work in different places and times will exhibit predictable relationships among specified variables, <u>but any particular historical outcome, of course, is entirely context dependent</u>. To understand the particular historical outcome in any historical setting, whether at the site, the local, or the regional scale, requires understanding other independent and dependent variables at work in those settings. Accordingly, in this chapter I present a model of a placer mining settlement and transportation system at various spatial scales of analysis. The sources for the model are primary and secondary historical and geographical data sets. These sources deal with similar extractive settlement systems, primarily located in the Western areas of the United States and Canada, during the latter half of the nineteenth and the beginning of the twentieth centuries. “Extractive” systems here refer to those human socio-cultural systems that take an naturally-occurring product from the environment, one that is not intentionally grown, domesticated, or manufactured. Examples includes minerals, oil, timber, and even most commercial fishing.

This chapter is structured as follows:

(1) *Self-Sufficiency and Dependency Models:* First, a brief review of appropriate models from the historical archaeological literature is presented, models which are applicable to understanding mining-related sites near the turn-of-the-twentieth century. The models of particular interest are "Dependency Models," because of their applicability to the expansion of Euroamericans into the Trans-Mississippi West during the latter half of the nineteenth century (see Bunker 1984; Greenwood 1992; Lewis 1984; Shoup 1983, in Reno 1994).

Although these latter sources above identify many key variables and characteristics relevant to my formulation of an early placer gold mining settlement model, additional research was needed when it was felt that (a) certain variables required additional attention, (b) certain variables had not been specifically addressed in terms of gold mining extraction, or else (c) certain variables had been entirely ignored. Thus, following the first section above which reviews Dependency Models, and presented with a particular view towards gold mining systems, there follow in this chapter seven additional sections which further explore variables pertinent to the development of a General Dependency Model of an Early Placer Gold Mining Settlement System, outlined next.

(2) *Differentiation:* The second section below explores further one of the underlying tenets of this study directly in relation to mining, that although there are fundamental

similarities and apparent homogeneity between different places and times, each historical setting is unique owing to the particular details and historical conjunctions of variables and processes that are occurring at any one time and place.

(3) The Nature of Transportation Systems and Extractive Economies: The third section in this chapter briefly explores the crucial dependency that profitable mining had on establishing and maintaining an efficient transportation system. An efficient and cheap transportation system is the key to the development, and continued use and development, of most mining areas.

(4) *Patchy Resource Base Reflected in Settlement and Transportation Systems:* The next section examines the direct relationship between the spatially discrete resource base that gold mining depends upon, to the nature, location, and duration of mining settlement and transportation systems. In the case of mining, the "patchiness" of the resource base may be the deciding factor on locations of settlements.

(5) *Placer Mining Settlement Hierarchy:* The next section examines the hierarchical nature of the settlement system that develops to support the mining operation. This hierarchy includes several "tiers" of settlement types involved in the transportation of supplies into and out of a mining region, as well as settlement "tiers" which serve to distribute goods within a region and those sites where extraction of the mineral and consumption of material goods occur.

(6) *Centrality and Central Places*: This section examines the economic geography notions of centrality and central places and their specific applicability to mining settlement system.

(7) *Individual Settlement Layout Patterns*: The different types, or "tiers," of settlements in a mining settlement system perform different functions, are differentially located, and have different population densities which are reflected in different settlement layout patterns. This section investigates specific layout patterns found in different types of mining settlements.

(8) *Other Characteristics of Gold Mining Settlement Systems.* This section lists numerous other social, economic, site locational, architectural, and demographic characteristics of mining settlements as commented upon by Western mining historians.

(9) *Expectations Of An Early Placer Gold Mining Settlement System:* A final section, following and directly based upon these eight prior background sections, outlines seven "Expectations" related to placer gold mining settlement and transportation systems of the late-nineteenth and early twentieth centuries. These seven "expectations" are addressed in the following Chapter 5, which examines each "expectation" in relation to the Alaskan gold mining context at the turn-of-the-twentieth century.

SELF-SUFFICIENCY AND DEPENDENCY MODELS

Following a recent increase in legal interests related to western late-nineteenth and early-twentieth century archaeological sites (e.g., Hardesty 1988:105-117; Noble and Spude 1992), efforts have concomitantly been directed towards developing appropriate models to deal with this emerging data set. In brief, related but conceptually distinct types of models have been formulated to aid in the description and explanation of historical and archaeological data relevant to the expansion of mostly Euroamerican populations into the Trans-Mississippi Western United States, Western Canada, and Alaska. Two such types of models are here referred to as "Self-Sufficiency" and "Dependency" models. These models are useful to addressing our present concerns: that of understanding the variables and processes that influenced decision-making on the placer mining scene in Alaska at the turn of the twentieth century.

Self-Sufficiency Models

Building upon scholarly foundations of American "frontier" literature stemming from Frederick Jackson Turner's original 1893 thesis regarding the American Frontier and national development (Turner 1894; Bogue 1990), Steffen (1980) focused upon the nature and degree of isolation as a means of characterizing and distinguishing fundamentally different types of frontiers. Steffen distinguishes two "levels" of social change in a colonizing/frontier area: (1) basic "fundamental" change which encompasses a dramatic revision or even substitution of socio-cultural, economic, or political practices, and (2) "superficial" change, which embodies merely a modification of a practice "whose conceptual foundation remained essentially the same" (Steffen 1980:xi). He introduces the concept of "degree of insularity." The degree of insularity is a reflection of both the nature and number of linkages between the frontier and the homeland. Steffen (1980:xi) suggests a direct relationship between degree of insularity and type of social change in frontier settings. With few or no links between a frontier population and its homeland, a frontier has a higher degree of insularity, and the nature of the frontier environment as an active agent of change upon an incoming, migrating population is enhanced. However, if the nature and number of links between a frontier population and its homeland are great, the frontier had a low degree of insularity, and cultural and/or political divergence from the homeland was less likely. Therefore, "fundamental change" was more likely to occur in those cases where a colonizing population entered a different or unfamiliar environment, one that had few transportation and/or communication links with the homeland; the reverse was true in those cases where there was a low degree of insularity, regardless of the nature of the environment (Steffen 1980:xi).

Based upon the notion of "insularity," Steffen defines two basic types of "frontier" models applicable to United States national history and westward expansion: "Insular" and "Cosmopolitan" (see Table 4.1; for Cosmopolitan, see Dependency Models below). Insular frontiers, and Self-Sufficiency Models in general, are characterized by: fundamental economic, political, and/or social change; change that is caused by factors predominantly internal to the system; few interacting links between homeland and frontier (i.e., a high degree of insularity); long-term settlement; economic diversity; and, initially

Table 4.1 Insular versus Cosmopolitan frontier types (after: Steffen 1980).

INSULAR FRONTIERS		COSMOPOLITAN FRONTIERS
"fundamental" economic, political, &/or social change;	vs.	"superficial" economic &/or political &/or social change;
change caused by factors internal in nature;	vs.	change caused by external factors, or factors common to both internal & external environments;
few interacting links between homeland and area of colonization (i.e., high degree of insularity);	vs.	many interacting links between homeland ; and area of colonization (i.e., low degree of insularity);
long-term settlement and diverse economics and briefly self-sufficient (i.e., non-market oriented);	vs.	often short-term and economically specialized;
Example: United States agricultural frontier east-of-the-Mississippi.	vs.	Examples: United States agricultural frontier, fur trade, ranching, & mining west-of-the- Mississippi.

and briefly, self-sufficiency in economic practices (i.e., non-market oriented). In the United States, the only example is the eastern Trans-Appalachian or Cis-Mississippi agricultural frontier (Steffen 1980).

Kenneth Lewis provides an extensive effort at applying such concepts to historical and especially archaeological data. His book, *The American Frontier: An Archaeological Study of Settlement Pattern and Process* (Lewis 1984) is the culmination of his efforts in this regard, and is an expanded outlook on ideas developed and written earlier (Lewis 1975, 1977, 1985). Lewis develops a classic "Self-Sufficiency" Model of Insular Frontier Settlement based upon an economically-oriented, world economic perspective. "Insular" is taken from Steffen (1980), above, and refers again to agricultural, permanent, "isolated" (i.e., geographically and/or relatively fewer number and extent of linkages to a homeland), and ultimately associated with "fundamental" social, economic, and/or political changes on the part of the incoming population. Lewis's model is based upon "principles" derived from numerous historical comparative studies, derived from a variety of fields and disciplines such as ecology, evolutionary biology, economics, and geography. He tests his model, presented as a series of hypotheses and observable predictions, against both historical and archaeological data from the eighteenth century South Carolina agricultural frontier.

Dependency Models

In contrast to Self-Sufficiency Models, Dependence Models are those socio-economic colonizing systems which maintain strong links with their homelands, whether economically, socially, and/or politically. Steffen (1980) contrasts "Cosmopolitan" frontiers point for point with his Insular frontiers concept (see Table 4.1). Cosmopolitan frontiers, an example of Dependency Models, are characterized by: superficial economic, political, and/or social change; change caused by either external factors or factors common to both internal and external environments; many interacting links between the homeland and the colonized area (i.e., a low degree of insularity); often short-term settlement; and economical specialization (Steffen 1980:xii-xiii). Examples from the United States include the trans-Mississippi agricultural settlement, the fur trade, and ranching and mining frontiers. Leyburn's (1935) slave- and plantation-based "exploitative agriculture" is applicable here, as well (c.f., Lewis 1984:16-17).

Steffen's short list of characteristics of Cosmopolitan frontiers, which serve just as well to describe Dependency Models in general, has been expanded considerably by later researchers. Starting with Lewis's discussion on this matter, a list of twenty-eight characteristics of Dependency Models, numbered sequentially, are presented in the following pages.

While most of Lewis's (1984) research centers on Insular frontiers, he provides some discussion on modeling Cosmopolitan frontiers, which are included here within

Dependency Models (Lewis 1984:263-292). Six types of Cosmopolitan frontiers have been defined in previous literature: trading, ranching, exploitative plantation, military, transportation, and industrial frontiers, with mining being an example of the latter type (Hardesty 1985; Leyburn 1935; Steffen 1980; in Lewis 1984: 264-268). Lewis believes that processes common to all types of cosmopolitan frontiers result in their overall similarity. Such processes are directly related to the fact that all six types are specialized commodity producers situated in peripheral positions to the world economy (c.f., Wallerstein 1974). The core-periphery relationship of Cosmopolitan frontiers as producers of extractive resources in peripheral zones in a global world economy has been noted by others (e.g., Bunker 1984:1018; Hall 1989:18-21, in Reno 1994:1-2; Hardesty 1988:1-5; White 1991:236-269).

Specifically, Lewis discusses four processes characteristic of Cosmopolitan frontiers, that are applicable to our general development of a Dependency Model of a placer gold mining settlement system. One is linked to the idea that in order to efficiently and effectively exploit a particular resource in an area, there will be an initial plethora of possible behavioral choices (owing to the heterogeneous nature of the population), which is then followed by a narrowing in the range of economic behavior for that type of Cosmopolitan frontier. That is, behaviors or practices having "adaptive value" in any particular setting are likely to get fewer and fewer in number as production becomes more and more specialized through time. This notion has also been addressed by other authors (e.g., Aldich 1979; Hess 1979:130-131; Jordan and Kaups 1989:19-37). Ultimately, the more specialized the economics of an extractive setting, the more specialized is the technology and behavior of the system, and the more culturally and technologically standardized will be that region compared with other similarly-organized systems (Lewis 1984:271).

Cosmopolitan frontiers are also characterized by the process of "punctuated equilibria." Basically, changes in efficiency of organization, or newer more efficient technology, spread rapidly and widely throughout areas extracting like resources or commodities, resulting in a homogenization of material culture across often distant areas. Such effective transfer of knowledge and/or technology was a direct result of the extensive and efficient transportation and communications systems within and between these Cosmopolitan frontier (mining) areas and the "metropolitan" core, or homeland. Lewis (1984:272) borrows this concept from Hardesty (1985), which is drawn from Gould and Eldredge's (1977) biological model of paleontological evolution and extinction. Change is not witnessed as continuous, but as "steplike" and all but concurrent across space. By analogy, one does not see in cosmopolitan frontiers a gradual "evolution" of technology or organizational efficiency, but instead changes characterized by mass "extinctions" of previous forms and sudden and widespread appearance of new forms. Others (e.g., Francaviglia 1991:116) have also noted this "standardization" and rapid spread of advantageous and efficient technology and techniques throughout similar mining districts.

The final two common processes of Cosmopolitan frontiers presented by Lewis are "differentiation" (1984:273), and "colonization" (1984:273-274), and are discussed in separate sections of this chapter, below (see, Differentiation, and Patchy Resource Base).

Lewis presents a series of ten attributes which "occur across all of the cosmopolitan frontier types, regardless of the commodity produced or the environment inhabited, and suggest the operation of common developmental processes at a general level" (1984:271). Such attributes begin our listing of characteristics of Dependency Models in general, which is expended upon further in the following pages:

(1) limited, specialized economic interest in the production of few or only one export commodity, whose value is determined by external variables;

(2) high personnel turnover and a high degree of temporary individual residence in the colonization area, resulting in short-term settlements;

(3) close and extensive economic and social ties with the metropolitan "core" or homeland;

(4) lack of self-sufficiency and thus a heavy dependence on material imports, including sustenance as there typically is no subsistence base (see also Rohe 1985);
(5) decreased insularity resulting in little internal change relative to the homeland made possible by an effective transportation and communications system;
(6) a relatively high degree of socio-cultural and technological homogeneity is maintained within each Cosmopolitan frontier type across space and through time regardless of different environments, resulting from a conscious effort by the migrants to maintain close behavioral ties to the homeland, as well as "the development of similar organizational structures to facilitate the various types of extractive activities";
(7) rapidly spreading homogeneity, especially of technology, is maintained through time in separated geographical areas, owing largely to the above-mentioned effective means of communications and transport;
(8) ownership and management typically directed by outside capitalists from the metropolitan or core area;
(9) changes or continuity in settlement and transportation form are directly related to a region's economic ties to the world economy, and are highly cyclical and prone to abandonment; and
(10) any inter-settlement or inter-regional differences are usually related to adaptations to meet specific local environmental variables (Lewis 1984:264, 268-269).

Nonetheless, differences do arise among and between different types of Cosmopolitan frontiers, and are related in part to the individual specialized commodity that each produces; that is, each requires a unique "adaptive strategy" (Lewis 1984:275). The "adaptive strategy" or structure of each Cosmopolitan frontier type, as an extractor and exporter of commodities, is related to the nature, location, and accessibility of the resources, the available extractive and transport technology, distances to markets, the presence of antagonistic or competitive groups or states, and the processing requirements of the commodity (Lewis 1984:276). Therefore, similar Cosmopolitan frontiers in different regions, faced with the same variables above, should display overall organizational similarities. This idea is a fundamental tenet of this thesis, as expressed throughout this study, and the basis for formulating the series of "Expectations" for archaeological abandonment (Chapter 3) and for distribution and composition of gold mining settlement system (see below).

Lewis then provides four attributes that specifically characterize Industrial frontiers, one of his six types of Cosmopolitan frontiers, of which mining is only one example (Lewis 1984:284-286). Lewis's specific Industrial frontier attributes are also applicable to Dependency Models in general, and thus they are added sequentially to the characteristics of Dependency Models list started above (# 1-10):

(11) they exhibit a "resource-based pattern of settlement," that is, production technology and population should be located specifically where "patches" of resources occur;

(12) the labor force should consist of either members of the incoming/colonizing population, recent immigrant groups, or aboriginal natives;

(13) a frequent mobility of camps would result in continuous alterations to the transportation system, usually dictated by least-cost variables; and

(14) a multiple-tiered settlement hierarchy is anticipated. In his admittedly preliminary thoughts on this matter, Lewis includes in this hierarchy (a) at least one "entrepot" serving as a processing, collection, and distribution point between the frontier area and the rest of the world, (b) "resource extraction sites" or "camps" where the collection and at least some processing of the resource occurs, and (c) "intermediate supply centers" which may actually be associated with the camps, and move when they do. I shall return to the issue of mining settlement hierarchies below, when I add more settlement types or "tiers" to this Lewis's basic hierarchy (see Placer Mining Settlement Hierarchy).

Other authors also provide general characterizations of extractive economy systems, <u>with no attempt to differentiate stages of development</u>, as Lewis does above by focusing on both Insular and Cosmopolitan <u>frontiers</u>, or the "early" phase of a colonization effort. These works include Bunker (1984), Greenwood (1992), Rohe (1984, 1985), and Shoup (1983, in Reno 1994). All of these authors except Bunker focus specifically on mining, and Greenwood and Shoup present their data specifically in terms of Dependency Models. In many cases these studies replicate aspects of Lewis's lists, as presented in the fourteen characteristics already outlined above, and will not be repeated. In other instances, however, these other studies add to Lewis's research. Additional generalized characteristics of Dependency Models derived from these sources are added sequentially to the characteristics already listed above (# 1-14):

(15) an increasing unit cost of production over time relative to productive economies;

(16) an infrastructure that is often developed specifically for the requirements of the particular resource;

(17) an emphasis on resource rights relative to land rights;

(18) a tendency for increased state participation relative to productive economies (e.g., manufacturing; crops; husbandry), owing to the jurisdictional allocation of resource rights and transportation development;

(19) disruption of existing human settlement and ecological systems;

(20) the ecological, demographic, and infrastructural impacts of extractive economies tend to limit future productive capabilities in some contextual circumstances;

(21) a tendency to "dominate" as opposed to "adapt" to the environment;

(22) racial and ethnic heterogeneity;

(23) cash-oriented economy;

(24) overall weak communal and family development;

(25) relatively higher crime rate relative to productive economic areas;

(26) a low level of social equality and a developed class structure;

(27) capital intensive as opposed to labor intensive; and

(28) external or non-local ownership of property such as claims and technology (Bunker 1984:1056-1061; Greenwood 1992:60; Rohe 1984, 1985; Shoup 1983, in Reno 1994: Table 1).

These other Dependency Models, while acknowledging the dynamic, fluctuating nature of extractive-based economies, are nonetheless not temporally sensitive, contrary to Lewis's model. That is, not all characteristics in their models are necessarily accurate for the entire duration of the economies to which these models are applied. For instance, early placer mining systems were not necessarily capital intensive, separated into social classes, or had property owned by outside interests. Although these latter characteristics may eventually develop in such areas, they do not necessarily typify the initial stages of placer mining development and settlement. As I am interested in developing a general Dependency Model of an early placer gold mining settlement system, similar to Lewis's attempts to develop a model of an Insular "frontier" settlement, only those characteristics applicable to an early placer gold mining settlement system are used in the formulation of the Expectations in the final section of this chapter. "Early" of course is subjective and context-dependent, and is defined in this study in the beginning of the next Chapter 5.

The discussion above is predicated upon building a list of twenty-eight characteristics of generalized Dependency Models, which are derived from a variety of sources (Bunker 1984; Greenwood 1992; Lewis 1984; Rohe 1984, 1985; Shoup 1983, in Reno 1994; Steffen 1980). These sources identified key variables and characteristics relevant to my formulation of an early placer gold mining settlement model. However, only some of these sources dealt specifically with placer gold areas (Greenwood 1992; some of Shoup 1983). Additional research was needed when it was felt that certain variables in the listing above required additional discussion (Differentiation; Mining Transportation Systems; Patchy Resource Base Reflected in Settlement and Transportation Systems), or were deemed too general and required more attention to make them pertinent to a placer gold mining system (Placer Mining Settlement Hierarchy; Other Characteristics of Gold Mining Settlement Systems), or else had been largely overlooked (Individual Settlement Layout; Centrality and Central Places). Thus, there now follows seven sections which further explore issues specifically pertinent to the development of a General Dependency Model of an Early Placer Gold Mining Settlement System.

DIFFERENTIATION

One of the processes common to Lewis's (1984:273) Cosmopolitan frontiers, and to Dependency Models in general is "differentiation." This notion conforms to one of the underlying tenets of this present thesis: that although there are fundamental similarities and apparent homogeneity between different places and times, each historical setting is unique owing to the particular details and historical conjunctions of variables and processes, e.g., natural, biological, cultural, economic, that are occurring at any one time and place. In fact, Francaviglia (1991:95) acknowledges that despite all the generalizing characteristics and processes that are associated with mining regions throughout American history, he still notes that "Diversity is a trademark of our American mining districts. In fact, ...they are probably the most varied communities in the country." Such differences in unique historical contexts include but are not limited to the nature of the specific commodity produced or extracted (e.g., Hardesty 1988:18-66), existing governmental policy across time and space (Aschmann 1970), specifics of geology or geomorphology (Rohe 1995:173-174), the presence of previous modes of either extractive or "productive" economies in a locale (Bunker 1984), and the constraints and demands of differing environments which require local adaptations to organization and technology.

Specifically addressing gold mining frontier settings, Rohe (1995) states that each particular gold mining district's geographical setting has certain general environmental conditions that *have* to be taken into account. Such essential factors include amount and duration of water and fuel availability (themselves dependent upon climate, altitude, precipitation, etc.), as well as effect of topography on transportation development. These fundamental factors were not lost on earlier observers (e.g., Burchard 1882, Hubbard 1911, in Rohe 1995:173, 178). The particulars of each locale were enough to result in differentiation, even with the extensive homogenization of mining techniques and technologies, mentioned above: processes "that emerged in most mining districts had idiosyncrasies reflecting the local environment and the use of available materials and power sources to reduce costs" (Rohe 1995:174).

Accordingly, geological and hydraulic variables were often the motive for innovation for new technologies or techniques, such as hydraulicking to remove unprofitable overburden, tunneling and shoring methods, pumping equipment, continued improvements to stamping and crushing mills, varying concentrating and amalgamation processes, various water control devices (e.g., ditches, flumes, canals, reservoirs, penstocks), and ultimately dredging to work low-grade and previously-worked deposits (Innis 1936:223, 237; Rohe 1994:122-125, 1995:174-175). Alaskan and Yukon Territory mining "idiosyncrasies" resulted in part from dealing with specific contextual variables of the arctic and sub-arctic, including extreme seasonal fluctuations in water supply, and the thawing of placer deposits in permafrost (e.g., Adney 1900; Rickard 1909; Beistline 1947; Colliery Engineer Co. 1897; Dunham 1900; see Heiner 1977:458-459 for additional references).

THE NATURE OF TRANSPORTATION SYSTEMS AND EXTRACTIVE ECONOMIES

The dependency of profitable mining on efficient transportation has been noted by many independent observers, and is applicable to the present discussion on placer gold mining. In short, an efficient and inexpensive transportation system is the key to the development, and continued use and development, of most mining areas. The following statement by the Gold Commissioner in Dawson, Yukon in 1901 is quoted in full because of the succinctness and clarity with which this issue is recognized:

> Every reduction in freight rates, every reduction in the cost of living in the Yukon Territory makes possible the introduction and operation of a higher class of machinery and cheaper production of gold. At present time ground that could not be worked at a profit a year or two ago can be successfully mined. Each change

> that lessens the cost of production increases the area for profitable working. It is confidently anticipated that large areas which have already been mined to the full extent that they profitably could be at the time they were mined under then existing conditions, can soon be wholly re-worked at handsome profits. Transportation has been the serious obstacle to cheap mining (as quoted in Innis 1936:217).

U.S. Geologist A.G. Maddren wrote of this problem throughout Interior Alaska in 1910:

> ...transportation is a primary factor governing mining development and is of most vital importance, a high cost of mining generally being chargeable to the lack of cheap and satisfactory facilities for the conveyance of ample supplies from the United States to the placer-gold districts. The mining industry is largely controlled by this factor, for no matter in what part of the territory mining is undertaken the problem of transportation enters as a primary influence in determining the relation of the mining costs to production, and the difficulty or ease with which a particular locality may be supplied...(1911:265).

The link between mining transportation systems and settlement hierarchy, location, and founding was sometimes so direct as to be causative, as noted by the Gold Commissioner in Dawson in 1901: "The construction of government roads has been the cause of little villages springing up on the creeks where miners can purchase their supplies without making the long journey to Dawson" (as quoted in Innis 1936:218; emphasis added).

Transportation systems associated with mining enterprises include not only the actual routes but also the services required by the people operating the means of transportation, the resource being transported, and the means of transport by which people transferred the resource. Transportation systems are regarded by Lewis (1984) as a separate type of cosmopolitan frontier, the means, shape, and duration of which depended directly upon the specifics of the resource or product being transported.

In his discussion, Lewis notes several characteristics of such transportation systems, which are taken into account when formulating the Expectations of an early placer gold mining settlement system in the final section of this chapter. Transportation systems in Cosmopolitan frontiers are (Lewis 1984:268, 288-289): (1) associated with, yet remain separate from cosmopolitan frontiers, serving to link the frontier both internally, as well as externally to the core; (2) they are dependent upon the nature and fluctuations of the cosmopolitan frontier through which they pass and serve; (3) unlike other cosmopolitan frontier types, no production or processing of a commodity takes place along its route; (4) they have several of the characteristics noted for cosmopolitan frontiers in general, especially those involved with dependency on imports, and growth and decline relative to external factors and variables; and (5) any settlements are likely to be isolated "special activity settlements" directly associated with the transportation networks. Examples of such transportation systems from Western literature include pony express stations, overland mail routes and stage stops, and railroad refueling and water stops. The nature of the early Alaskan placer mining transportation system is outlined in Expectation #7 (Transportation Services), below.

PATCHY RESOURCE BASE REFLECTED IN SETTLEMENT AND TRANSPORTATION SYSTEMS

One of the fundamental differences between mining settings and other types of economic systems, such as agriculture, ranching, and trapping, is the nature of the location of the resource being utilized or exploited. While recognizing that variability certainly exists within these latter three economic systems, they all nonetheless rely upon a widespread, spatially dispersed resource. The locations and duration of settlements and the supporting transportation systems associated with these latter three economic systems are influenced in part by the widespread nature of the resource being utilized. Mining, however, depends upon a more spatially discrete, or "patchy," resource base, and the nature, location, and duration of mining settlement and transportation systems are dependent in part, if not wholly, upon the specific resource being exploited. In the case of mining, the "patchiness" of the resource base may be the deciding factor on locations of settlements.

The nature of mining's "patchy" resource base is touched upon by Hardesty (1985), who reviews Charnov's (1976) marginal value theorem, which in the present mining discussion states simply that, once found, the extraction of a mineral "patch" will continue as long as it is profitable to do so. Hardesty relates how continuity or duration of human settlement in mining locales also depends upon whether the nature of the resource is renewable or non-renewable. If renewable, cycles of re-exploitation may develop owing to the specific characteristics of the resources. If non-renewable (as with mineral resources), abandonment and/or return results from a variety of factors, including a fluctuating market price (e.g., see Figure 4.1, from Aschmann 1970: Figure 2), changes in levels of technology and transportation, governmental policies and taxation, labor costs, infrastructure costs, and renewed capital investment (Aschmann 1970:173-182; Hardesty 1985).

In addition to location and duration, the "patchiness" of mineral resources may also directly influence the nature and timing of the spread of both settlements and transportation systems. That is, it may influence the rate and nature of both settlement system expansion and transportation system expansion.

I develop these ideas in response to Lewis's (1984) discussion of these topics, in his presentation of a Model of Insular Frontier Settlement in colonial South Carolina (see above). Two key points of Lewis's Insular frontier, Self-Sufficiency model are drawn into focus at this time: (1) the continual, slow outward expansion of the system inland, away from a coastal entrepot, and (2) the "dendritic" nature of the formative transportation system during the initial "frontier" phase of expansion. Neither of these two characteristics typify placer gold mining settings, and they are each addressed next relative to a mining context.

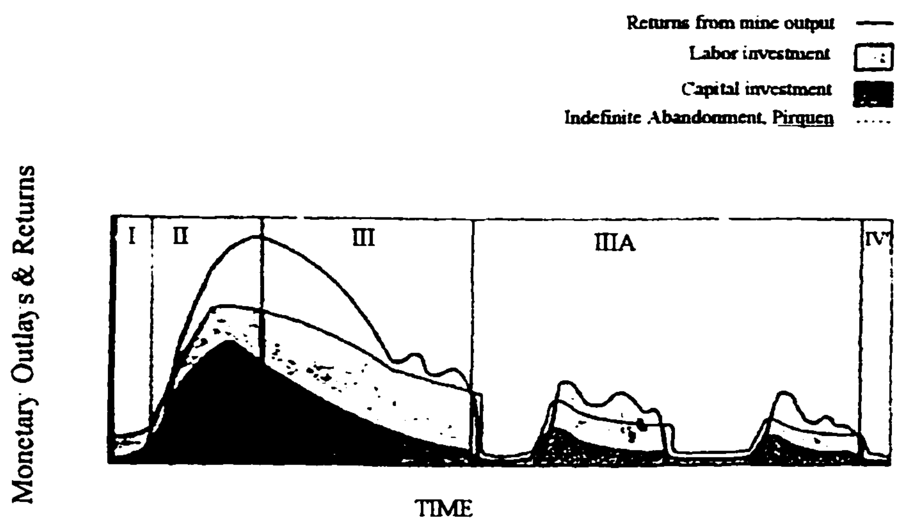


Figure 4.1 Stages of mining development relative to labor and capital investment and returns. I: Prospecting and Explorations. II: Investment and Development. III: Stable Operation. IIIA: Intermittant Operation Owwing to Price Flucuations. IV: Decline. (Source: Aschmann 1970: Figure 2).

The Nature of Settlement Expansion in a Mining Region

Lewis (1984:22), drawing upon Hudson's (1969) agriculturally-based "location theory for rural settlement," presents a general model for agricultural settlement pattern development and changes through time. Based in part upon Hudson's model and other data, Lewis hypothesizes for his South Carolinian agricultural frontier that: first, a continuous, progressive expansion through time is expected away from the (coastal) entrepot; second, a spreading of settlements will occur into immediately surrounding areas forming distinct clusters of settlements; and third, that the settlement pattern through time should tend towards even spacing owing to an increasing population density and competition for land (Lewis 1984:111-112, 161-177). Data corroborating Lewis's expectations are reproduced here as Figure 4.2 (from Lewis 1984: Figures 7.1-7.10)

Hudson's (1969) generalized "theory," which again assumes a relatively evenly-distributed resource, arable agricultural land, has also been corroborated in a variety of other agricultural settings (e.g., Olsson 1963: Figures 2-8). However, one would not expect this model to occur on a mining frontier, where resources are patchy and spotty across the landscape, and settlement is directly associated with such patches. Similar to Lewis's "colonization" process, above, Francaviglia (1991:67-85) too regards "isolation" and the resulting "nucleation" (i.e., resulting clustering of settlements and activity) as two of the principal processes affecting the unique development of mining districts. He describes such districts as urban "islands" in an otherwise under-populated setting. Physical "isolation" of settlements and entire districts result directly from resource "patchiness." This is not a desired trait by mining communities, but instead an outcome of geological and geomorphological variables: "The distribution [of mining communities in a mining district] is rarely if ever random: rather, most mining districts have an overall grain or texture of urbanization that closely follows the ore bodies and topography" (Francaviglia 1991:81) . Rohe (1995:169-193) explains that most gold areas in the United States occur in and are likely related to tectonic activity, with few and/or inferior quality

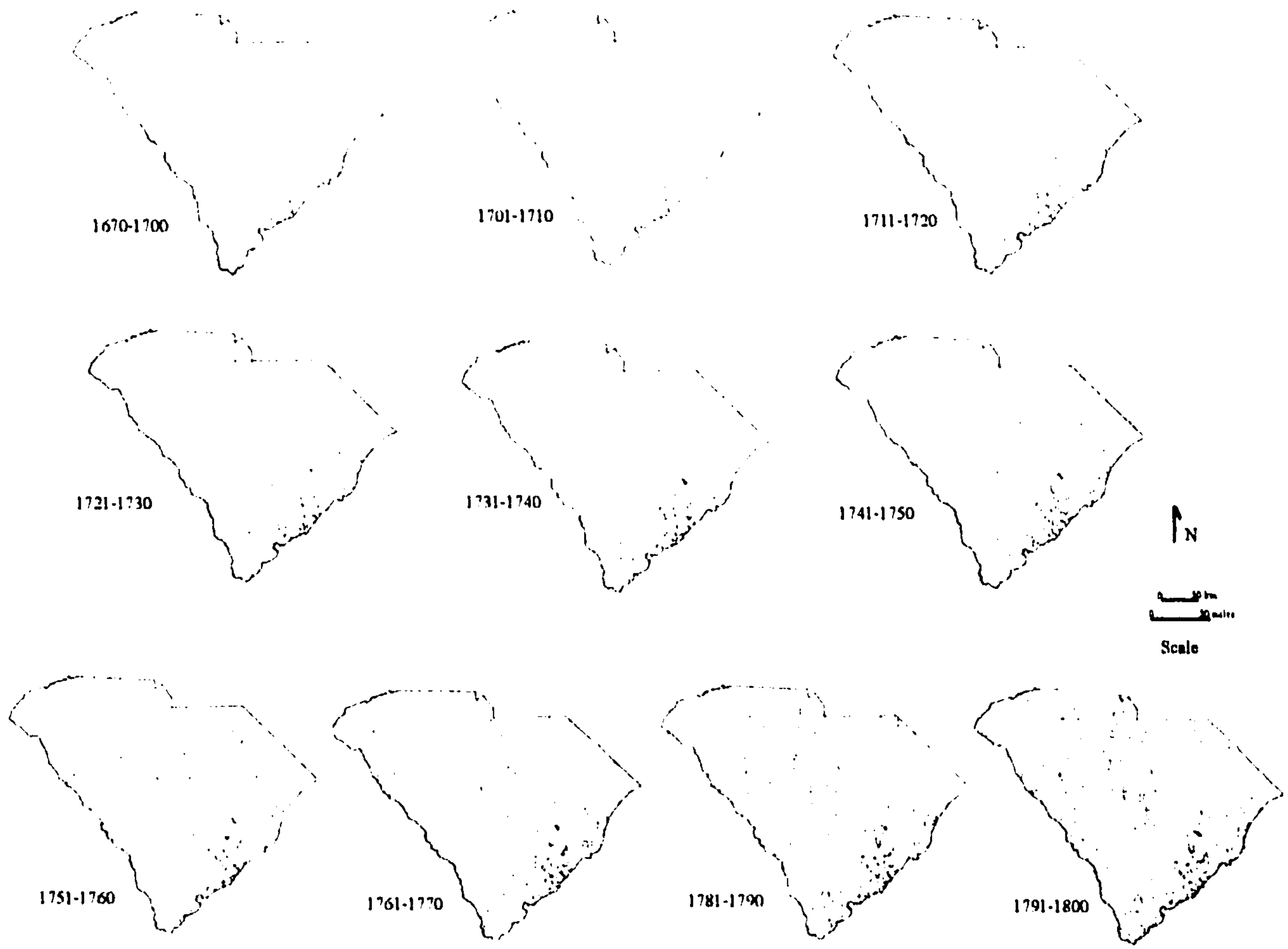


Figure 4.2 Settlement distribution in an agricultural frontier setting in South Carolina, 1670-1800. Note progressive expansion away from the coasts, spreading into surrounding areas, and an even spacing through time. (Source: Lewis 1984: Figure 7.1 to 7.10).

deposits found in horizontal, unaltered geological deposits. As a result, almost all gold districts (and likewise, silver) are found in mountainous areas, and relatively few in flatter regions. A plot of all past gold production locales in the United States (Figure 4.3; from Shields et al. 1995: Figure 20) bears this out, with most gold production activity restricted to mountain ranges like the Appalachians, the Rockies, the Sierra Nevadas, and the Cascades, and relatively few in the Plains and inter-mountain plateaus. Accordingly, the distribution of major gold mining districts in the western United States largely conforms to this pattern (Figure 4.4; from Rohe 1995: Figures 1 and 2). It is interesting to note that even within both of these distributional maps (Figures 4.3, 4.4), further distinct clusters of intense gold activity are seen, reflecting the locale-specific nature of this mineral resource. This "patchy" characteristic is also witnessed in mining towns based upon other mineral resources (e.g., Figure 4.5; from Alanen 1982:96, map). In sum, mining town locations were dictated almost exclusively by adjacency to workable ground, a point we will return to below.

A Non-Dendritic Transportation System in a Mining Region

A second contentious issue is Lewis's view of the pattern of a transportation system associated with an Insular, agricultural frontier. Production and transportation are the key variables influencing frontier settlement system distribution, and its internal organization. Transportation is responsible for economically (and socially) binding a settlement system together, and maintaining links to the homeland: goods and services need to be brought in and distributed where needed, and the export commodities produced need to be shipped outward (1984:21). Transportation routes are often affected by least-cost considerations, which are in turn directly affected by host of natural and social varaibles, including distance, topography, labor expense, etc. Because a frontier transportation system's primary purpose is the import and export of commodities, goods, and services, Lewis says its form will follow a "dendritic" pattern focused on a coastal

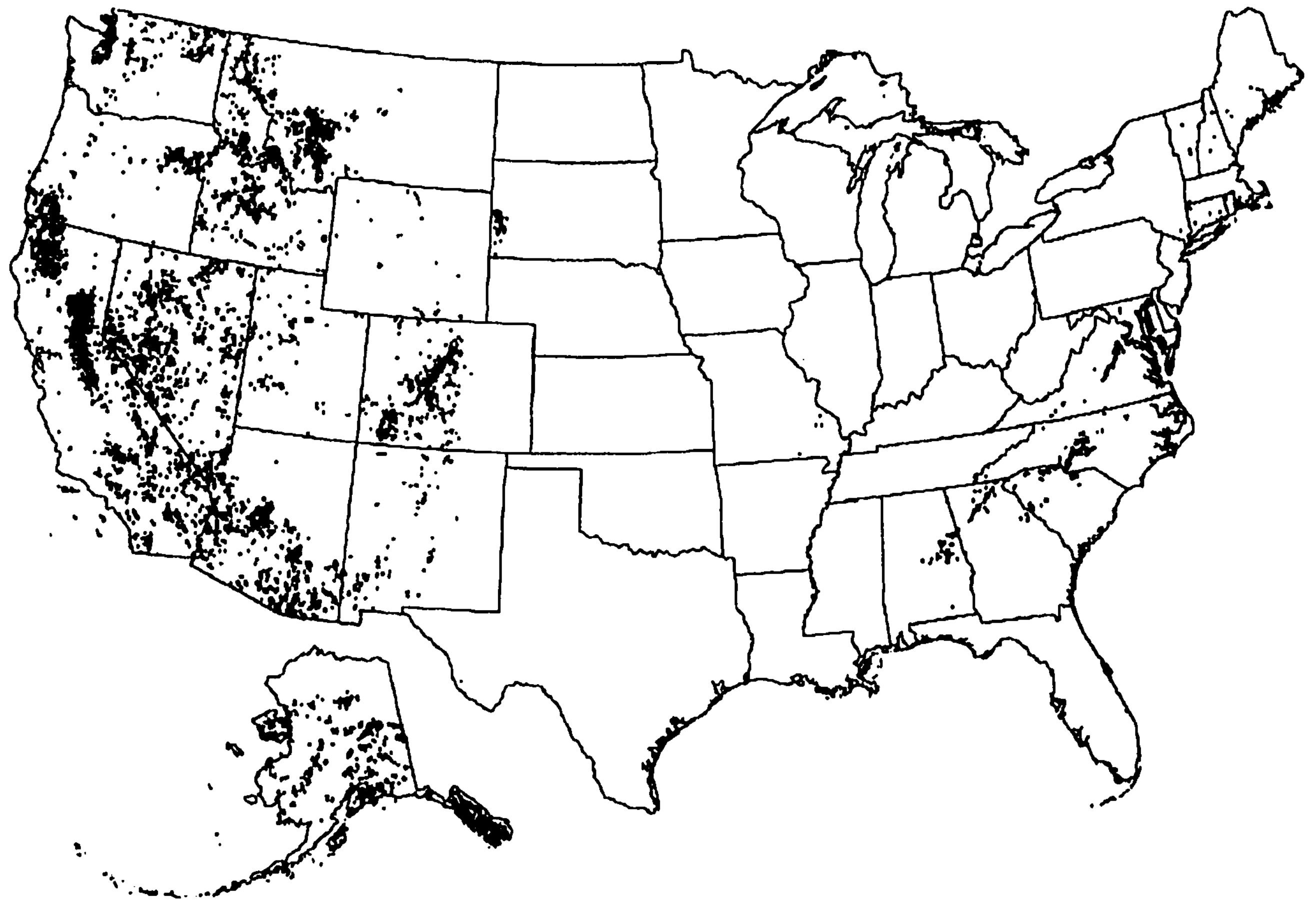


Figure 4.3 Minimum distribution of abandoned and inactive gold mines in the United States, N=17,497. Note concentration of mines in mountainous areas. (Source: Shields et al. 1995: Figure 20).

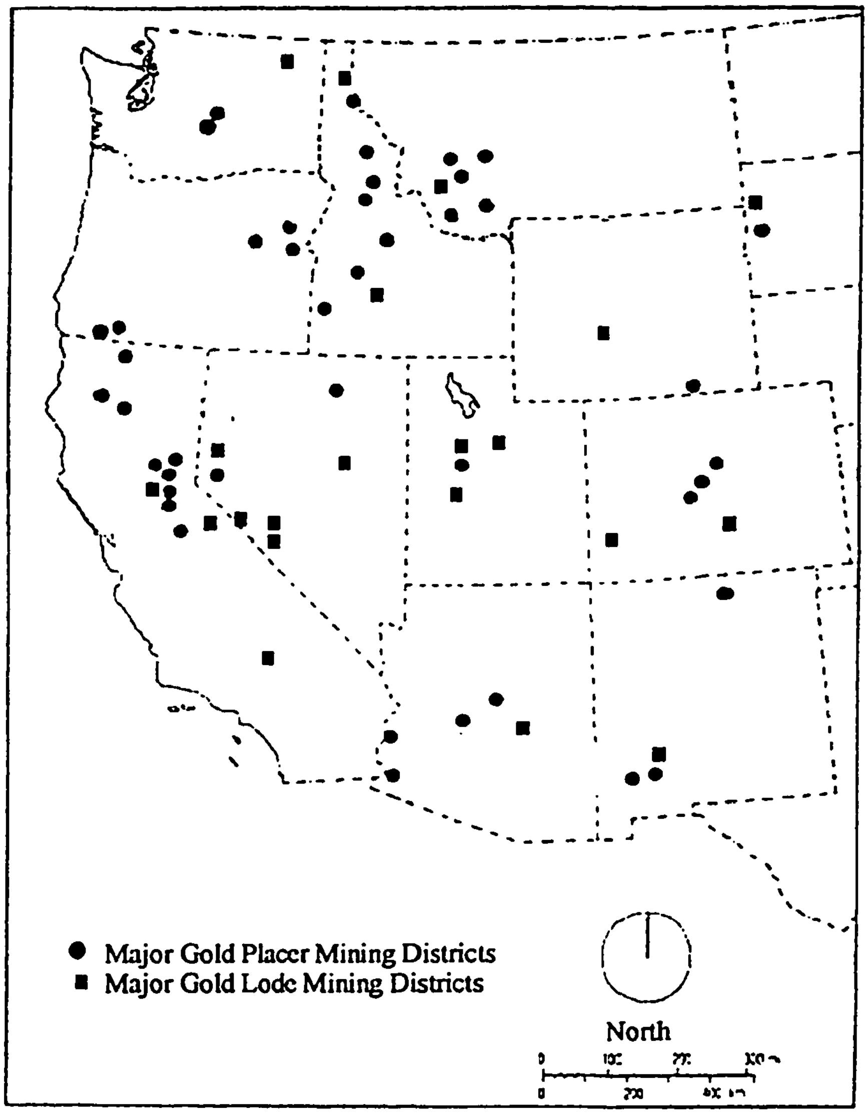


Figure 4.4 Major placer and lode gold mining districts, western United States. Note the "patchy" and clustered nature of the districts, and their predominately mountainous settings. (Source: Rohe 1995: Figures 1 and 2).

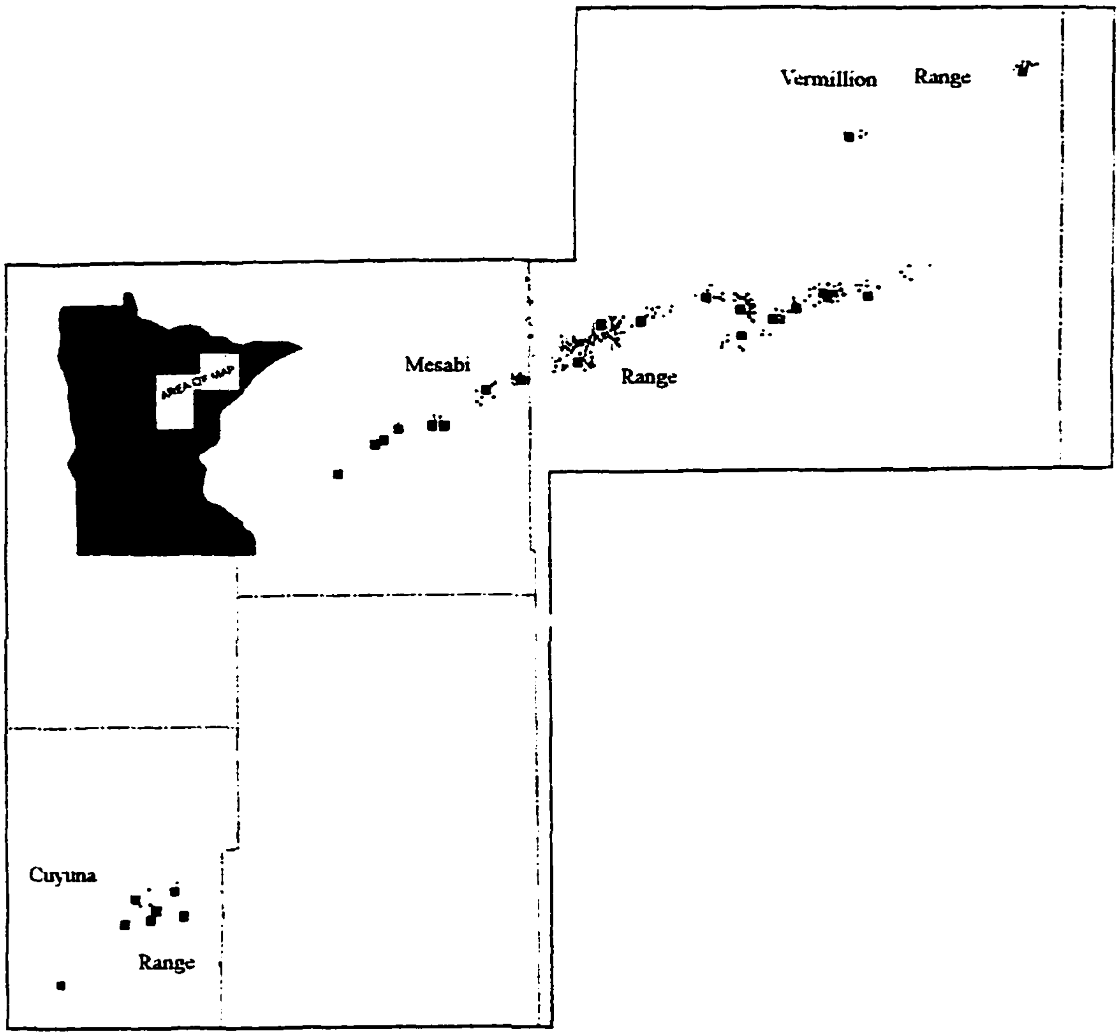


Figure 4.5 Distribution of townsites of over 250 people (squares: as of 1920) and "locations" (dots: groups of residences next to mines) on Minnesota's Iron Ranges. 1880s-1940s. Note conformity of settlement locations directly to ore concentrations near the surface. (Source: Alanen 1982:96).

"entrepot" (e.g., Charleston, in his South Carolina insular frontier example), which is the main settlement linkage between the frontier and the European homeland. "So important is the organization of this trade that routes facilitating the most direct feasible movement are quickly established even if less efficient precolonial road systems already exist" (Lewis 1984:21). Local transportation systems change in direct response to any organizational changes brought on by expansion of the frontier. Lewis summarizes the initiation and growth, through time and space, of a frontier transportation system into a fully developed, post-frontier system: (1) initial establishment of ports with few land connections between them; (2) expansion of routes into the interior around each, thus reducing transportation costs to some ports; (3) markets increase and further expansion occurs around these successful locales; (4) "feeder routes" expand their hinterlands often at the detriment of other ports; interior "nodes" form along major inland routes, and establish their own feeder networks; and (5) feeder routes and interior settlements "soon begin to mesh" together, eventually linking all major ports, nodes, routes, and other interior settlements (Lewis 1984:21-22, and his Figures 3.34 to 3.36). "This [latter] complex network of trade and communications contrasts with the simple network of the frontier period and marks the reorganization of the transport structure in response to the greater economic and political integration of postcolonial settlement" (Lewis 1984:22).

Thus, in his insular, agricultural frontier model, Lewis distinguishes an earlier "frontier" dendritic transportation network from a later non-frontier network, from one that emphasizes the flow of goods to the entrepot and de-emphasizes internal connections, to one that is more developed and internally connected. See also Taffe et al. (1963) for a generalized model of transportation development through time, inland from coastal ports.

Aspects of this general frontier dendritic transportation model fit an industrial cosmopolitan frontier (e.g., ports with initially few inland routes; favoring of those ports that establish inland routes over time relative to others; see also Taffe 1963). However, the "patchy" nature of the mining resource will likely have an effect on the developing nature of a transportation system, contrasting with the more-evenly distributed arable land of a temperate latitude agricultural frontier. As a result of these fundamental differences. Expectation #6 (A Resource-based Settlement and Transportation Pattern) is formulated in the last section of this chapter, below.

PLACER MINING SETTLEMENT HIERARCHY

One of the first generalizing projects that specifically dealt with establishment and characteristics of a developing settlement hierarchy in a "frontier" setting was Casagrande et al.'s (1964) work on contemporary Ecuadorian agricultural frontiers. In fact, the authors clearly state that one of their goals was the production of generalizations for historical explanation purposes: "We assume that there are cross-situational regularities in colonization, and that the close study of contemporary cases may yield general understandings that can illuminate ... historical reconstructions and current instances of creative change on the world's frontiers" (Casagrande et al. 1964:282). With this goal in mind, the authors propose the "colonization gradient," a principle relating isolation to distance and to internal cultural change in settlement types (Casagrande et al. 1964:311-316). Essentially, their contention was that the greater the distance between the source of the migration/colonization (i.e., the metropolitan area) and the area of colonization (i.e., the frontier), the more tenuous become the links between the two areas's binding institutions, resulting in increased erosion in social and cultural ties. Keeping in mind that the authors deal primarily with agricultural settings, Casagrande et al. proposed the following settlement types as characteristic of frontier settlement systems, a five-tiered (agricultural) frontier settlement hierarchy (see Table 4.2): (1) entrepot, (2) frontier town, (3) nucleated settlement, (4) semi-nucleated settlement, and (5) dispersed settlement (1964:312-314). Lewis (1984:23), in his assessment of this work, adds (6) the "pioneer fringe" to this list, which is comprised of a population located *beyond* the main colonization area. In this latter case, subsistence and often "destructive" agriculture practices prevailed owing to a lack of a commercial frontier transportation system. and a lack of competition for land resources.

While not all of the settlement types listed above are unique to a frontier setting, what is unique is the pattern of types and the relationships found between them (Casagrande et al. 1964:314-315). The last five settlement types list above (i.e., frontier town to pioneer fringe) are all located within or at the edge of the colonization area, and are differentiated in terms of: (1) access to direct transportation and communications link to the entrepot, (2) stage in the supply network, (3) focal point for various economic and banking, governmental and municipal, political and law enforcement, social and religious services, (4) spatial size, population size and density, and organizational complexity, (5) number and variety of occupational specializations, and (6) demographic makeup (see Table 4.2). This colonization gradient may also be viewed diachronically, for any settlement type usually goes through the types preceding it, however briefly. However, not all settlements pass through all of the settlement forms, and once a certain level in the hierarchy is reached, there is no guarantee that "retrogression" will not occur back to a previous type, especially as the "moving frontier" passes by and the rate of transportation development does not keep pace with expansion (Casagrande et al. 1964:314-315).

On the other hand, Lewis (1984:284) postulates a three-tiered settlement hierarchy when specifically referring to an industrial settlement system, of which mining would be an example. Lewis's hierarchy consists of (1) resource extraction camps, which are typically short-lived and mobile, located at the point of extraction where the accumulation and at least some processing of the resource occurs, (2) intermediate supply towns, which may or may not be associated with actual locations of mineral extraction, and are potentially as ephemeral and mobile as the extraction camps, and (3) an entrepot, which serves as the processing, collection, and distribution point between the peripheral mining area and the rest of the world.

A slightly different trichotomy is presented by Paula Marks (1994:185-186), who specifically addresses North American "frontier" gold rush settings of the latter half of the

Table 4.2 Casagrande et al. & Lewis's Colonization Gradient-based settlement hierarchy (sources: Casagrande et al. 1964:312-314; Lewis 1984:23).

ENTREPOT
- the "vital link" (in terms of transportation & communication links, economics, political, and sociocultural integration) between the area of colonization with metropolis;
- located at or near the edge of metropolis.

FRONTIER TOWN
- a supply center for an area within the area of colonization; terminus of transportation system linking frontier area with metropolis;
- a "jumping off" point for new people into the area of colonization;
- a focus of social, economic, political, religious activity;
- often a focal collection point for exports;
- often the only banking and medical facilities in an area;
- larger in size & population than other settlements within the area of colonization;
- has a variety occupation specialists supplying materials or services not typically located outside the frontier town;
- has a municipal government with broader scope of municipal functions than surrounding
- smaller settlements;
- usually contains any national government branch offices in the surrounding area.

NUCLEATED SETTLEMENT
- terminus of frontier transportation system (e.g., road, railroad, river transport, airstrip);
- some level municipal government, and often a church which are irregular in performance;
- presence of a regular school;
- spatial cluster of structures; at least 1 store;
- other services context dependent but do not rival the associated frontier town as the main source of supplies;
- focal point for special social functions for immediate surroundings.

SEMI-NUCLEATED SETTLEMENT
- serves possibly as an irregular source of supplies;
- no separate store, operating instead out of a domestic unit;
- no formal municipal government;
- church and school may or may not be present.

DISPERSED SETTLEMENT
- zone of scattered "households" still within the area of colonization;
- may or may not be situated along existing transportation routes.

PIONEER FRINGE
- a population located beyond the main colonization area;
- subsistence and/or "destructive" agriculture practices prevail;
- lacks direct link to the commercial frontier transportation system;
- lacks competition for land resources.

nineteenth century, from California to the Klondike. Her hierarchy consists of: (1) a pre-existing external major supply center taking advantage of its relative positioning to the new strike, through which most prospectors en route to the strike pass; (2) intermediate centers serving as staging locations to the diggings; and (3), "mining-camps-turned-urban-centers" which serviced a surrounding mining region. We see that Lewis and Marks differ only in their third, or lower-most tiers, with Lewis suggesting an end-of-the-transportation-link small camp located at the point of resource collection, whereas Marks's third tier still serves a distributing function to surrounding creeks.

Randall Rohe (1985) developed a more refined four-tier settlement hierarchy in his examination of nineteenth century, trans-Mississippi gold mining areas in California, Colorado, the Northwest, British Columbia, and South Dakota. His model is based on the order of transfer of goods from source to destination, as follows: (1) the Major Supply Center, (2) Secondary Supply Points, (3) Distribution Points, and (4) Mining Towns, which are located proximate to workable ground. The first three tiers are essentially supply towns meant to feed the fourth. This preponderance of supply settlements in a mining settlement system is directly related to this system's lack of self-sufficiency, as well as the remoteness of mining districts from established outside supply networks. To these four tiers of Rohe's hierarchy can be added a fifth tier when dealing with placer gold mining areas, corresponding to the Extraction Camp. This latter category would include those households or domestic units and other structures actually located on individual claims, directly at the point of extraction.

The locations of the first three stages of Rohe's settlement hierarchy, that is, the supply-oriented towns and cities, result from the interaction between available transport technology and geographical factors. In short, supply and transfer points emerge where <u>change in mode of transportation of supplies is required</u>. "Each time circumstances required a change in the mode of transport, a new settlement or an existing one almost invariably developed into a transshipment point," with the first break associated with the limits of rail or ocean steamers, followed by the limits of river steamers, wagons, and finally pack trains (Rohe 1985:55-56). Economists have long noted settlements developing at transportation transfer points (e.g., Cooley 1894).

Using California as an example (Figure 4.6; see Rohe 1985:40-43, map p.42), we see the Major Supply Center, San Francisco, developed not solely because of its proximity to the inland gold fields but more importantly because of its excellent port suitable for ocean vessels, which after 1849 arrived almost exclusively from the United States east coast (its "metropolis" or "core"). From this point, goods were transferred to streamers or sailing vessels en route inland to the Secondary Supply Points of Marysville, Sacramento, and Stockton, all located along a river system that empties into San Francisco Bay. From these locations, goods were transferred mostly to wagons but also to pack trains and shipped to various Transshipment or Distribution Towns. These "'heads of whoa navigation' or sub-depots were usually the larger and strategically located mining towns" (Rohe 1985:41). Such towns had specific geographical advantages, including centrality and accessibility, that favored them for this hierarchical tier over others. From these locations pack trains supplied the surrounding district's Mining Towns, and thence on to the creeks.

From this and other examples, Rohe illustrates several points about gold mining settlement systems throughout the Western United States and British Columbia. First, the shifting nature of Casagrande et al.'s (1964) colonization gradient through time and space is amply demonstrated, and is even more pronounced in terms of rapidity than it is in agricultural frontiers. Rohe illustrates repeatedly the fluctuating growth and decline of different settlements within the same mining district, resulting from direct inter-town competition, new routes or improved quality of existing routes, and the opening up or closing of adjacent mining districts (Rohe 1985:55-56). Indeed, impermanence and fluctuations characterize the rapid growth and decline of entire mining districts in general, not only settlements within them. This situation is directly related to the exhaustion of the resource, supply and demand, technological advances, and transportation efficiency improvements (Rohe 1984:110, 113-114).

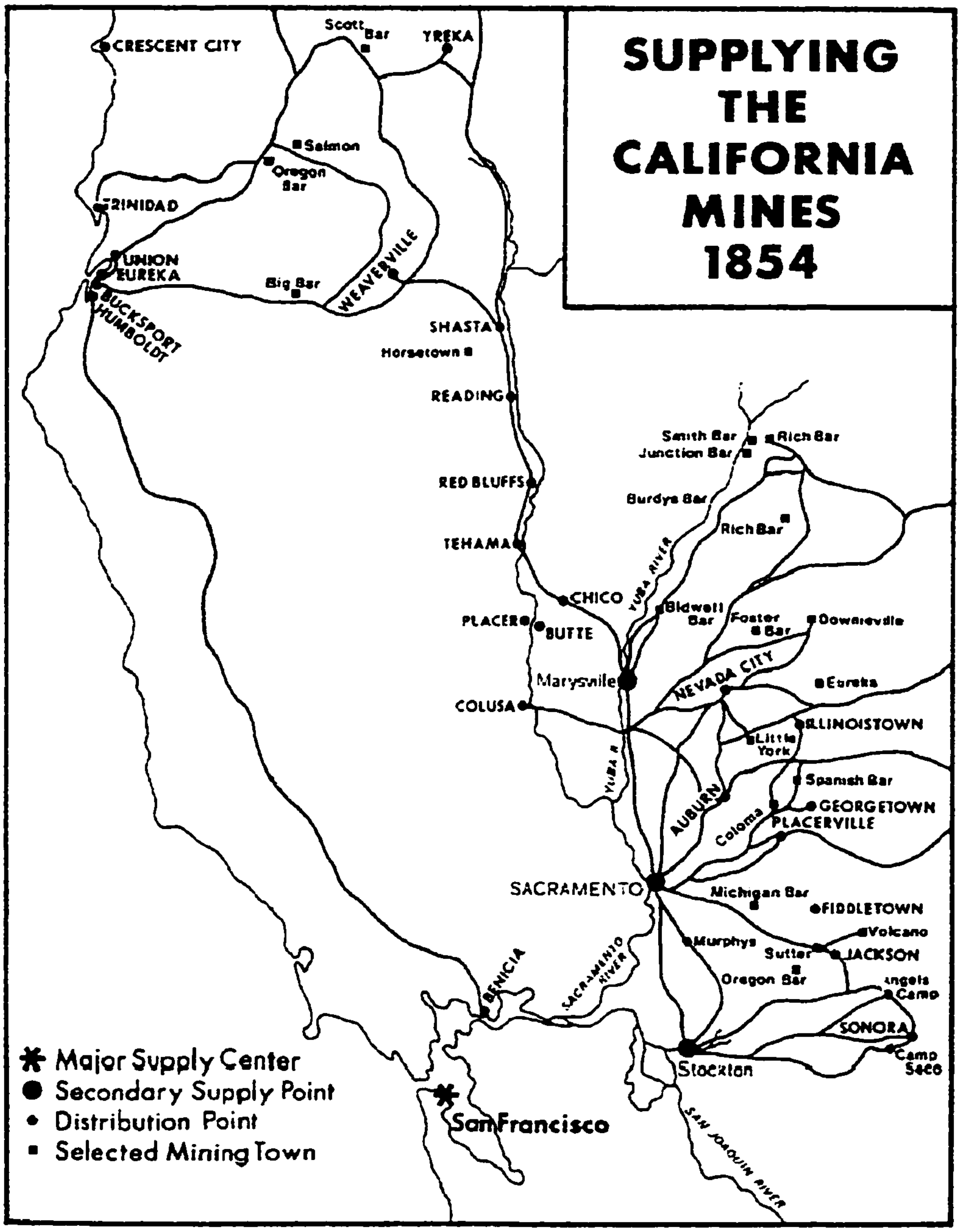


Figure 4.6 Gold Mining transportation and settlement system in California, 1854. Note a four-tiered settlement hierarchy, location of supply and distribution points at breaks in transport, and mining towms in proximity to gold diggings. (Source: Rohe 1985:42).

The second point Rohe makes about gold mining settlement systems is that both individual towns and entire mining regions were typified by rapid fluctuations in population, numbers of commercial establishments, tradesmen, and even municipal governments and social institutions such as churches, schools, and theaters. Population and physical size of mining settlement system towns would multiply greatly within months or even weeks of the initial discovery of gold (e.g., Figure 4.7; Rohe 1984:100-102, 110-112). For example, San Francisco went from a population of 800 in January 1848 to over 30,000 in 1851, Virginia City, Montana boasted a population of 10-15,000 within months

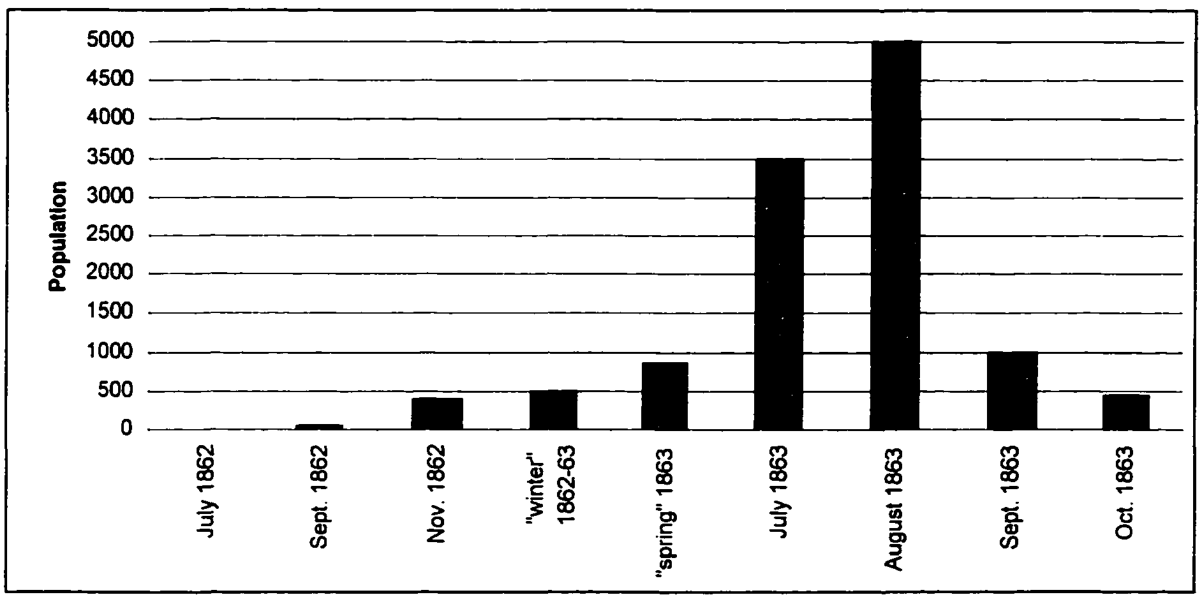


Figure 4.7 Population growth in a typical gold mining town, Bannock, Montana. Note rapid fluctuations in population size. (Source: Rohe 1984:111).

of its founding, 10,000 rushed to Deadwood Gulch, South Dakota in the spring of 1876, 6-8,000 were present at Dawson, Yukon Territory within a year of its discovery, with about 40,000 by the end of the next year, and lastly Nome, Alaska in June 1899 had three tents and a log cabin, but one year later boasted 20,000 people. Ultimately, as many as one million people would participate in the successive gold rushes in nineteenth century North America (Marks 1994:24-49, 189-190).

The third point made by Rohe about gold mining settlement systems is that not all "tiers" in the settlement hierarchy are necessarily represented in all mining districts. Obviously, hard-rock or lode mining would only have a single mining town at the transportation system's terminus, and therefore often no need for a central place. Also, Colorado's system did not have a single major supply town, but instead as many as 8-9 smaller supply centers mostly located in the Midwest along the Missouri River (Rohe 1985:43-44). These towns received goods via rail, steamer, or wagon, which then sent their goods to Denver, the single secondary supply center of the district, and from there to distribution points and ultimately the mining towns and creeks.

The fourth and fifth points illustrated by Rohe in his discussion of mining settlement systems are not only the tight clustering of mining towns in the same proximity (as discussed above), but also the rapid and early build up of a complex interconnecting web of transportation routes that existed between the towns within the gold districts and their supply centers. As explained earlier, Lewis (1984:21-22) discusses the eventual interconnectedness of settlements over many decades in an insular agricultural situation, with the earlier "frontier" transportation system dominated by a dendritic branching connection leading to the entrepot but not between inland settlements. Figure 4.6 illustrates the existing settlement system of central California in 1854, a mere six years after the initial discovery of gold on January 24, 1848. While the funneling of supplies and resources to and from the entrepot and the resource extraction area is occurring, there is an early and rapid establishment of an intricate interconnecting transportation and communications system between the Secondary Supply Points, the Distribution Points, and the Mining Towns. "Within ten years, transportation reached a point of development that characteristically required generations to achieve" (Rohe 1985:52), relative, that is, to earlier U.S. agricultural frontiers. In fact, intra-mining region transportation networks may reach a higher degree of development and sophistication than inter-regional connections to areas outside the mining area. As Francaviglia (1991:72) notes, "In many mining districts, an internal system of railroads developed before the district was connected to the outside world by rail." This was true of other forms of transportation. including tram systems and all-season wagon roads.

A sixth point made by Rohe regarding mining settlement systems is that permanence of settlement in peripheral mining areas was directly related to a town's development as a supply center. In short, "These supply settlements generally displayed a more stable growth and a greater degree of permanence than the mining communities" they supported (1985:56). Marks (1994:210), too, cites that becoming a regional supply center or seat of governmental offices as one of two ways for a mining settlement to remain viable during post-boom times. The other way was through development of long-term mining, presumably through heightened consolidation and capitalization of any remaining low-grade ore bodies.

A final point that Rohe illustrates about mining settlement systems is the propensity of mining transportation routes to follow along or utilize rivers and streams whenever possible. Obviously, navigable streams were initially utilized as a least-cost method when supplying the gold fields. However, it is also apparent from some of Rohe's illustrations (Figure 4.8, from Rohe 1985:44, map) that numerous streams were utilized as guides through otherwise "empty" terrain, connecting more-populated mining or supply centers. Essentially, a stream's "permanence" in otherwise little-known terrain was emphasized, at least during the initial establishment of a transportation system. However, such was not the case in Western Canada, which essentially did not have navigable rivers to aid mining development, but which instead relied solely upon railroad development (Innis 1936). This last point is made to once again emphasize one of the general points of this thesis, that regardless of other general processes involved, particular, contextually-dependent variables or processes can influence decision making in specific times and places. This applies to all of the processes and variables discussed in this thesis; history is not pre-determined.

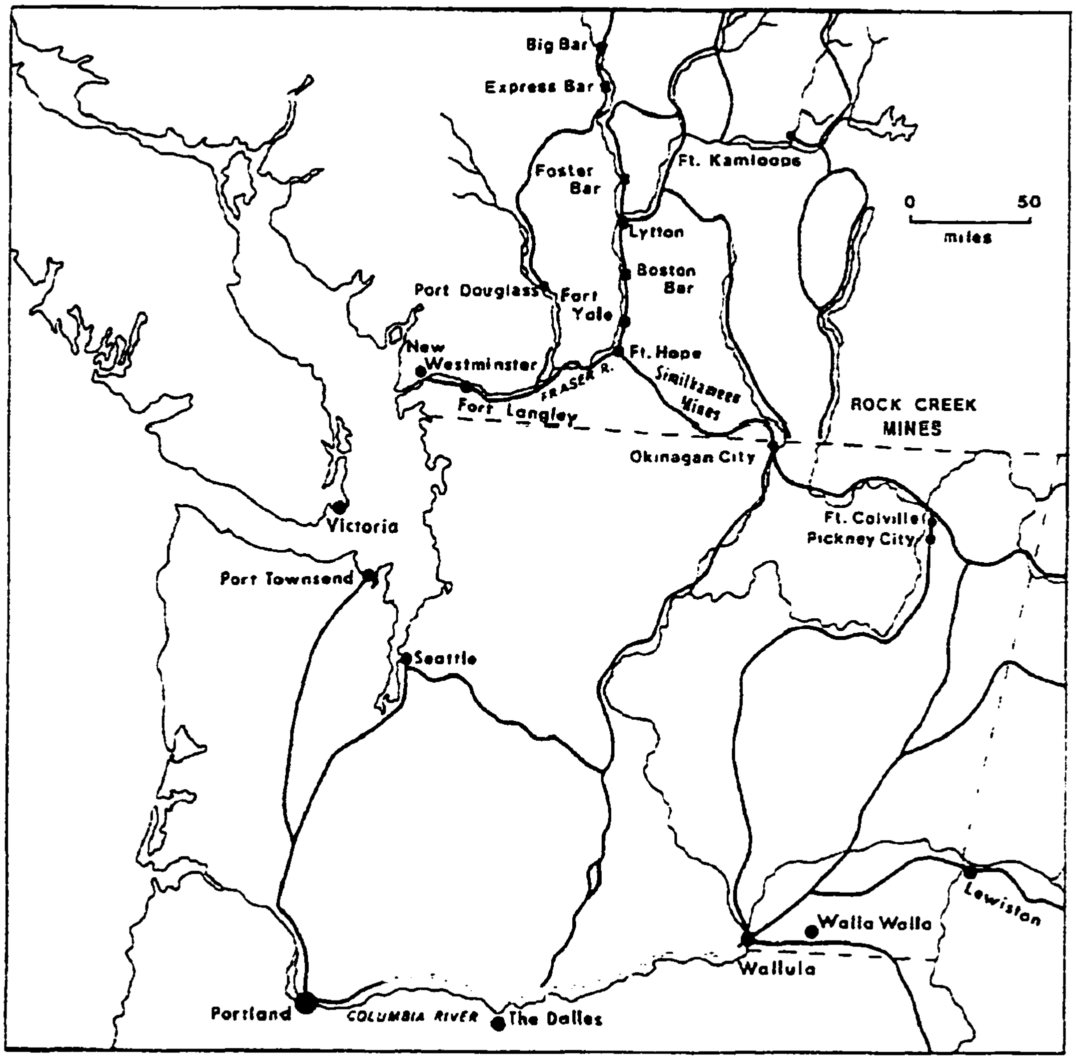


Figure 4.8 Gold mining transportation and settlement system in British Columbia, 1860. Note the transportation routes following alongside rivers and streams, connecting areas of higher population density across areas of lower population. (Source: Rohe 1985: 44).

CENTRALITY AND CENTRAL PLACES

Central Place theory is relevant to the study of mining settlement systems. The notion of "centrality" was introduced to geographical studies by Christaller (1933), and to English-speaking audiences by Ullman (1940/41). Centrality refers specifically to the servicing of a surrounding geographic area, not solely to geographical position of settlements relative to one another. In short, "Services performed purely for a surrounding area are termed 'central' functions by Christaller, and the settlements performing them 'central places'" (Ullman 1940/41:856). The purpose of central places, therefore, is the servicing (primarily economic) of a population in a surrounding geographic area or hinterland. Thus, a manufacturing center which imports resources from external areas and exports finished commodities to the same, would not be regarded as a central place. Likewise, population size by itself is not a measure of centrality; central places by definition have a smaller population relative to the number of services they provide (1940/41:858).

The theoretical distributional ideal of central places and the settlements they support is that of a hexagonal lattice, situated on a uniform landscape. In reality, the model is most closely witnessed in thinly-populated agricultural and non-industrial areas (Ullman 1940/41:858, 864), likely a result of the distribution of arable land conforming to the "uniform" assumption of the model. Thus, the theoretically-ideal hexagonal prediction of Central Place Theory would not be applicable to mining, with its "patchy" resource base. However, variation from the ideal owing to intervening variables and processes is one aspect of the original theory that has often been overlooked by successive writers. Of the many variables that affect and distort the model's ideal layout, many are agriculturally-oriented, such as soil type, type of agriculture, and intensity of cultivation. However, other factors that might distort the ideal model include type of government and its policies, lineal transportation routes, and the presence of "resources" (i.e., raw materials) in heavily industrialized areas (Ullman 1940-41:860). This last variable is important to our present discussion, illustrating the fact that early central place proponents recognized the effect "patchy" resources could have on settlement patterns.

The Central Place theory is therefore relevant to the study of mining settlement systems. Along with the "rush" of prospectors following any new discovery of gold were also businessmen and speculators, those that sought to "mine the miners." Many mining towns began as a single crowded street of commercial establishments laid out along an associated means of transportation, be it a stream or roadway. Around this commercial district a town would further develop (Rohe 1984, 1994). All manner of specialty retail businesses would be represented, even in the earliest rush and building phases, such as dry goods and grocery stores, restaurants, markets, saloons, bakeries, and laundries. In short, a characteristic of mining settlement systems was that the business districts of supply and mining towns were overly developed relative to the town's population: they were central places. "Many mining settlements attained a greater degree of commercial importance than similarly sized eastern towns. As centers of large areas, their trade assumed an importance all out of proportion with their size" (Rohe 1984:108, emphasis added). Mining towns also provided centrally placed social and recreational services (Marks 1994:207-209). Francaviglia (1991:35) points out that the greater number of service and retail stores was also likely related to the overly dependent nature of the single-male-dominated population of a mining town in its early stages of development: " [mining town commercial districts] are usually larger than those in agricultural towns or non-mining towns of comparable size [i.e., population] because the population of single males actively engaged in extractive industries is more dependent on others for the provision of basic goods and services."

One final point regarding centrality and settlement hierarchies is that, within a stable local system of settlements, each level or tier within the hierarchy has certain associated activities and functions. Within the settlement hierarchy, Berry (1967:33-34, in Lewis 1984:23) states that as population density increases in a region, a downward "shift" of social, economic, and political functions occurs to better serve the number of people. Thus, functions typical of a higher settlement level/tier would now occur in lower settlement levels. For instance, both type and quantity of functions typifying a Central Distribution Center for a district (e.g., banking; municipal government; local law enforcement; numbers of professional services such as lawyers and doctors), would also be transferred to lower-order Secondary Distribution Centers located closer to the diggings, when an increase in population occurs. Likewise, a decrease in population will result in a "shift" of functions out of Secondary Distribution Centers. This is a simple mechanism of supply and demand. Relative to a placer mining settlement system, we might suppose that the richer and/or more extensive the "paystreak" is, more miners will be supported, thus more services will develop to supply and service the miners, thus a more-developed settlement hierarchy. Viewed in this manner, centrality not only has a horizontal spatial dimension, but also has a "vertical" dimension.

INDIVIDUAL SETTLEMENT LAYOUT PATTERNS

John Reps (1975, 1979) reviews the nature of urban planning and layout for trans-Mississippi American Western mining towns, and Francaviglia (1991:82-85) reviews mining town layouts in general. From these discussions, it is clear that three variables lead to the eventual layout of mining towns: (1) local (often constricting) topography, (2) the intentional staking of a standardized "gridiron" pattern, and (3), to a lesser degree, the locations of pre-existing buildings or features (e.g., tailings, head frames). By the mid-nineteenth century, purposeful planning of towns in the United States was common practice, as opposed to relying upon gradual development (Reps 1975:272). If growth were to occur in and around a town, it would follow prescribed and regulated guidelines.

In western mining towns, the gridiron pattern of street and lot layout became the norm, being used throughout successive Western mining areas, including California, Nevada, Colorado, South Dakota, Montana, and Idaho (e.g., Figures 4.9, 4.10, 4.11). Reps's "gridiron" corresponds to Gillenwater's (1972; in Francaviglia 1991:31-32) "grid" pattern, one of four major layout patterns of coal mining towns in West Virginia ca. 1880-

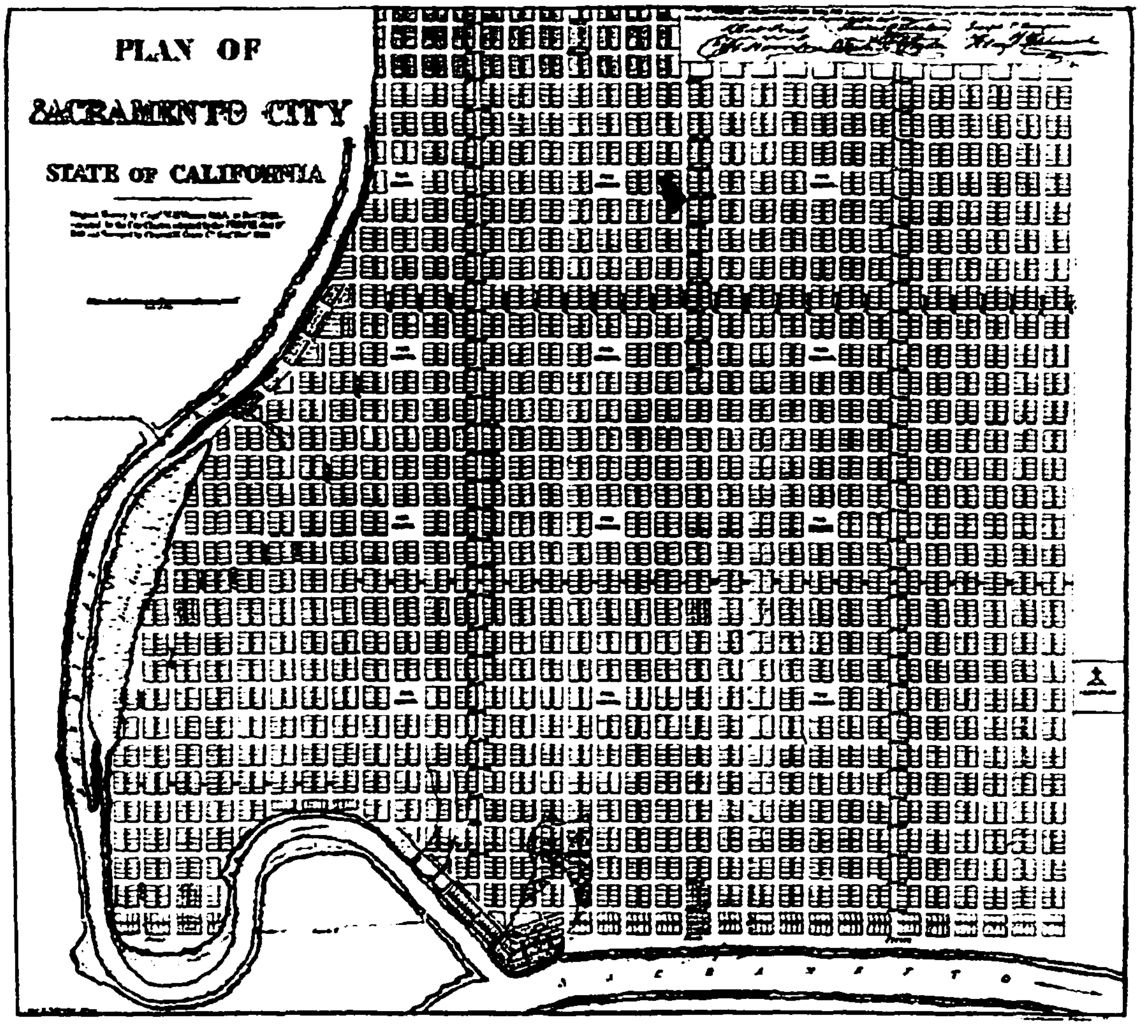


Figure 4.9 Plan of Sacramento, California in 1849. Note gridiron pattern imposed upon natural features. (Source: Reps 1975: Figure 1).

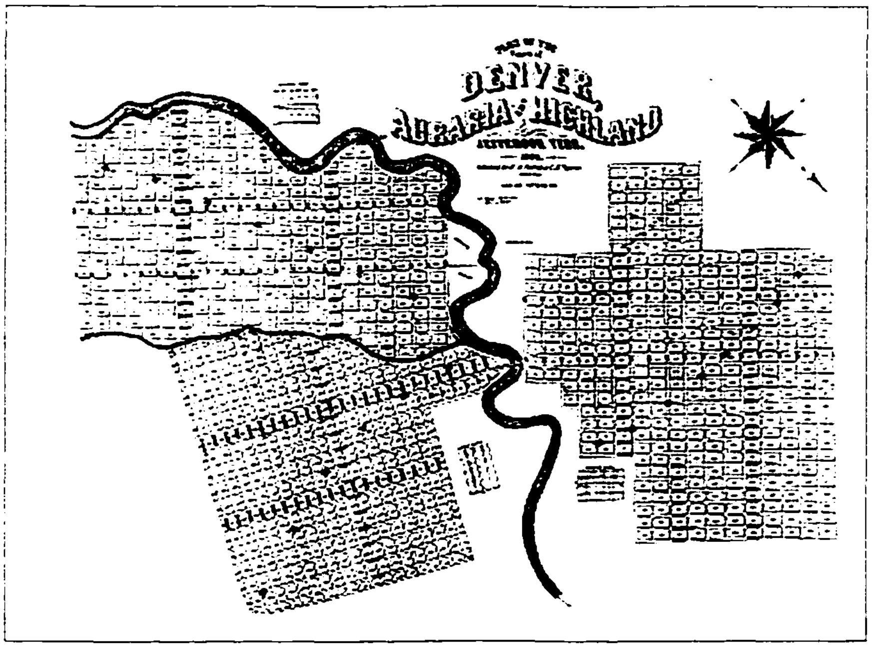


Figure 4.10 Plan of Denver, Colorado in 1859. Note gridiron pattern imposed upon natural features. (Source Reps 1975: Figure 2).

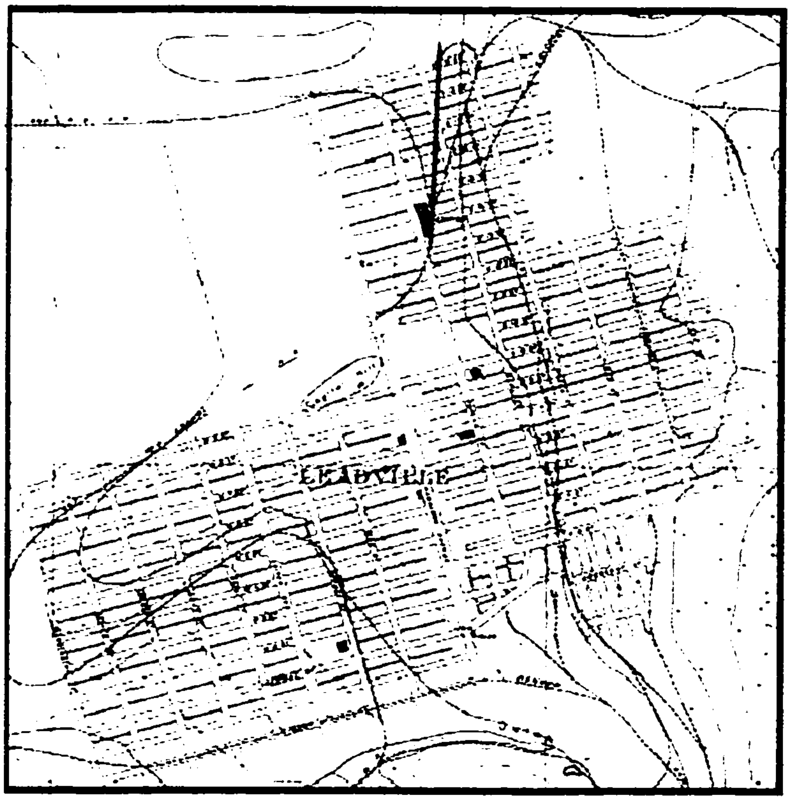


Figure 4.11 Plan of Leadville, Colorado in 1879, with railroads and shafts dating to 1910. Note gridiron pattern imposed upon existing topography. (Source: Reps 1975: Figure 7).

1930, the other three being "linear" (in a line in a canyon or along a transportation route), "converging" (among intersecting transportation routes), and "fragmented". Further supporting this notion of grid predominance, Francaviglia notes (1991:84) that despite the popular image of mining towns's layout being a "maze," "crooked," "winding," and "irregular" (e.g., Marks 1994:190), such non-grid patterned towns were actually few in number. "Overall, the majority of mining town plats, about 70 percent, exhibit varying degrees of rectangularity in their layout, an indication of the need for order and ease in surveying property lines," with variation resulting from time, centralized versus speculative development, and regional conditions (Francaviglia 1991:84-85).

Temporal circumstance often determined whether the gridiron came prior to initial town building, or was imposed upon an existing layout, typically to instate order to existing chaos. Reps (1975:275) notes that supply and distribution towns established en route to actual mining towns often escaped any initial haphazard melee, as such towns were often established after the initial gold rush to an area. Alanen (1979, 1982) points out that company towns or "locations" in mining areas, by their very nature, were all planned and organized by parent corporations prior to their founding, and exhibited none of the confusion of many early placer communities. As above, in some placer mining towns, the gridiron had to be imposed over a chaotic layout of existing streets and buildings, but in other places realty speculators arrived before, in anticipation of a rush, or along with the earliest prospectors and miners. Such speculators would rush to a likely location, file a land claim, plat an entire futuristic town at one time, and hope to cash in on lot sales (Alanen 1982:96-97; Marks 1994:187).

This anticipatory nature of town speculators apparently improved through time, for Reps notes that whereas most California towns had a gridiron imposed <u>after</u> initial development, subsequent rushes in Nevada and Colorado had a mixture of <u>both</u> established-first and imposed-after towns, while during the "later phases of the bonanza West" (circa 1880s-1890s) most mining towns were staked <u>before or during</u> the arrival of the initial rush population (Reps 1975:275; see also Alanen 1982:98-99 on this matter).

To explain this sequential improvement, Innis (1936) provides as explanation a dramatic improvement in technology during this time. In his assessment of successive gold placer strikes northward through British Columbia to the Yukon and Klondike (1850s-1890s), he acknowledges dramatic industrial technological improvements during the second half of the nineteenth century, bracketing the two great gold rush strikes in North American, California (late 1840s) and the Klondike (late 1890s) (c.f., Marks 1994). Such technological improvements resulted in increased efficiency in mobility, both of population and material supplies: "With the expansion of [development in an area], in the development of a variety of industries, with the increasing efficiency of the price mechanism, and with the continued improvement of industrialism, especially in relation to transportation, expansion with each successive gold rush became more rapid" (Innis 1936:177, 256).

As above, mining frontiers, as examples of cosmopolitan frontiers, are dependent upon supplies from the external core, as iocal manufacturing and agricultural pursuits typically have not developed to the point of self-support. By the late-nineteenth century, United States industry, and land and sea transportation systems were more than capable of supplying geographically-isolated Alaska. Innis's claims are supported by Maddren (1911:265) who states that all manner of food, clothing, implements, and machinery wanted by Alaska's miners were obtainable "ready-made" from the United States. Another example is supplied by Marks (1994:194), who claims that by the time Nome, Alaska was founded at the turn-of-the-century, "Advances in American manufacturing and shipping made city building possible with the arrival of a few well-stocked vessels." In addition to numerous "'knock-down theatres, gambling halls, saloons, hotels, [and] restaurants" which were arriving at Nome via ocean transport, a single day in May 1900 saw the arrival of four ships from Seattle carrying enough materials to found a newspaper and printing plant, a bank, a saloon, rails and other equipment for seven miles of railroad, 300,000 feet of lumber, 600 tons of coal, and "many" tons of mining equipment and general supplies, including plenty of liquor.

Besides square or rectangular grids, Hardesty (1988:14) notes that in actual practice many "smaller mining camps" had either a more "linear" alignment along a route of transportation, or else formed "convenient clusters around mills and mines." From this description, it would appear that when discussing "small camps" Hardesty is referring to Rohe's (1985) fourth tier of a mining settlement hierarchy (Mining Town), and his "convenient clusters" refer to structures on individual mining claims or at locations of mineral extraction. In addition to time, therefore, the establishment of a gridiron pattern may also simply be a reflection of areal size (Francaviglia 1991:84) and population[1].

The maintenance and/or reality of the grid depended, of course, upon local topographical factors, and sometimes had to be abandoned in part or whole. Some mining towns, without the benefit of level or near-level ground, developed on steep slopes of ravines, hills and gulches, the result being a town plan either dictated entirely by local circumstances, or one that followed existing contour lines. Accordingly, one might expect Alaskan gold mining town plans at or immediately after the turn of the twentieth century to follow a gridiron pattern from the earliest founding of a town, except where prevented by extreme local geomorphological circumstances.

ADDITIONAL CHARACTERISTICS OF GOLD MINING SETTLEMENT SYSTEMS

In addition to the above, other traits characteristic of placer mining settlements, transportation systems, and demography are drawn from Western historians and geographers. Such generalizations include (Francaviglia 1991:3-167; Rohe 1984:102-113, 1994:124-134, 1995:179): (1) settlement establishment on any level or near-level ground near the gold fields, if available; (2) towns paralleling existing transportation routes or the mineral deposits themselves; (3) diversification of the economy away from the "general store" that is typically found in agricultural settlements (e.g., Bailey 1982), towards a proliferation in specialized retail stores offering groceries, dry goods, clothing, bakeries, cigar stands, drug stores, tailors, and other objects and items too numerous to mention; (4) many male-oriented social and business establishments, such as a preponderance of saloons, gambling halls, billiard halls, and dance halls; (5) a relatively greater number of union buildings, and public and secret society lodge halls; (6) assorted other economic- and service-oriented businesses such a blacksmith or iron works, a stage office (or other transportation depot), an assay office, laundries, and banks; (7) spatial segregation of domestic units with most miners living on the creeks closer to their claims, while the supporting population lived in town; (8) further domestic segregation of the longer-lasting supply and mining towns into neighborhoods occurred, similar to Eastern towns and based upon occupation, wealth, race, and perceived social differences. This was especially prominent in well-planned company towns (Alanen 1979); (9) architectural details related to climate, available building material, lot size, time of building and then-current architectural trends (see especially Randall 1985), and eventual social stratification in the longer-lasting settlements; (10) prone to fire hazards (see also Marks 1994:204-206); (11) overall more "compressed" or "cramped" than non-mining towns owing to, generally, a small lot size and lack of side lots or yards; and (12) extreme pollution problems especially in non-incorporated towns, with sheet refuse spread throughout and any associated streams choked with refuse and sewage (see also Marks 1994:202-204).

In addition, populations in mining frontiers were (13) largely a young male-dominated population; (14) ethnically and nationally diverse, though still dominated by Anglo-Americans; (15) highly mobile and transient; and (16) had a diverse occupational structure, dominated by miners but containing an array of (decreasingly) tradesmen, professionals (e.g., lawyers, doctors), artisans, and unskilled laborers (see also Marks 1994:240-245).

Needless to say, company mining towns, being run by a single large corporation, differed markedly from placer mining towns in much of the above, regardless of the resource extracted. Obvious differences include the lack of an independent municipal government, the number and variety of service-oriented tradesmen and professionals, gender and age ratios, number of male-oriented social establishments, decreased variability in architectural designs (i.e., standardization; uniformity), and having only a single general company store as a retail outlet (Alanen 1982; Allen 1966; Francaviglia 1991:39, 47; Lucas 1971).

EXPECTATIONS OF AN EARLY PLACER GOLD MINING SETTLEMENT SYSTEM

The following seven Expectations are formulated from the above sections, and relate to a variety of issues relevant to understanding placer mining systems of extraction. They are appropriate to a variety of spatial scales, from the site level to the regional (e.g., Alaskan) level. Each of these expectations is evaluated against (mostly) historical data from late-nineteenth and early-twentieth century Alaska in the following Chapter 5.

Expectation #1, Extractive Economy: In general, Alaska is expected to conform to expectations of an extractive economy. That is, it should have a decreased level of "insularity" accompanied by no fundamental social or political change relative to the standards of the homeland. Moreover, it should have close and extensive social and economic ties to a colonizing "core" or homeland, a heavy reliance upon material imports from its principal "core" country is expected, and it should export an over-abundance of "extractable" resources to the "core."

Expectation #2, Settlement Fluctuations: Relatively short-term fluctuations (e.g., annual; decadal) in occupation, abandonment, and re-occupation of individual settlements and regions are expected, owing to high rates of population turnover. Continuous alterations to the transportation system should occur.

Expectation #3, Early Placer Mining Settlement Hierarchy: Depending upon population, topography, and degree of "frontier" development, a settlement hierarchy of up to five-tiers is expected in placer gold mining districts. These might include (from source to destination): (a) one or more Entrepots or major supply centers, depending upon geographical relationship to the core, (b) various Intermediate Transfer and/or Supply Points, (c) a Central Distribution Center, (d) various Secondary Distribution Points, and (e) numerous Extraction Camps. Minimally, the hierarchy needs at least one Entrepot, one Central Distribution Center, and Extraction Camps. This hierarchy should reflect the technological requirements of extracting and processing the resource, the existing transportation system, as well as supplying and maintaining the labor force in the placer district.

Expectation #4, Changes in Settlement Hierarchy: Economic, political, and social functions of individual settlements will shift through time, often relatively rapidly, resulting even in site abandonment. This results from resource depletion and changes in technology and transportation routes at various times and places within a district. Similarly, types or quantities of services typical of a higher settlement level/tier shift either down or up a tier in direct relation to an increase or decrease in population. This is a simple mechanism of supply and demand. Relative to a placer mining settlement system, we hypothesize that the richer and/or more extensive the "paystreak" is, the more miners will be supported, thus the more services will develop to supply and service the miners closer and closer to the actual mines.

Expectation #5, Development and Internal Dynamics of Central and Secondary Distribution Settlements, and Extraction Camps: A rapid establishment and build up of population, number of commercial establishments, numbers of tradesmen, municipal governments, and social institutions (e.g., schools, churches, theaters) should occur at settlements performing a "central" supply function, that is, at Central Distribution Centers and any associated Secondary Distribution Points.

In addition, these settlements should also have a proliferation of specialized retail and service outlets, male-oriented personal and social services reflecting a mobile population (laundromats; saloons; rooms for rent; restaurants; etc.), as well as inordinate numbers of union, public, and secret society lodges and halls.

Central Distribution Centers's layout will be patterned as an organized, well-planned gridiron. Whether this was planned before, during, or after initial site development will in part be a function of time (i.e., 1850s through 1900s). It is expected that late-nineteenth and early-twentieth century Alaska mining town sites should be platted before or during initial development. Whether or not a town deviates from such plans will owe in part to exacerbating physical topography, and/or the non-arrival of the anticipated "rush" of miners and merchants to the futuristic town site. Secondary Distribution Points, without the large population base of the Center, will likely develop either (a) a linear layout pattern (regardless of initial planning) along the associated transportation route or converging routes, or else (b) a less-developed grid, depending upon vagaries of population shifts.

Extraction Camps will comprise one or a few domestic structures, as well as any associated structures or features related to the resource extraction and collection procedure (shafts, gin poles, dams, sluices, open pits, etc.). Although this settlement type is the most numerous in the hierarchy owing in part to the high mobility of the population, many such camps will nonetheless be destroyed by subsequent mining practices, which typically operate at larger capacities and spatial expanses in order to extract lower and lower grades of pay.

Expectation #6, A Resource-based Settlement and Transportation Pattern: Production and processing technology, population, and hence settlement pattern will be located specifically where "patches" of resources, or mining districts, are located. The resulting frontier-wide settlement and transportation pattern will be non-dendritic (c.f., Lewis 1984:21-22), that is, not branching further and further outward/ inland slowly through time from a coastal entrepot or supply town. While expansion of the settlement system throughout the placer mining frontier through time obviously is expected, this occurs only in a broad manner (initially coastal, then interior along major transportation arteries (e.g., rivers), then along smaller tributaries). Expansion will occur neither evenly nor continuously away from the entrepot, as is expected in an insular agricultural settlement frontier with a more-evenly distributed resource base (i.e., arable land).

The frontier placer mining pattern instead should be a quick build up in otherwise undeveloped "isolated" areas. The build up should be relatively rapid (months, 1-2 years) in terms of population, town build up and diversification (see above), as well as quick development of transport links between settlement nodes within the patch. Such isolated patches of concentrated urbanization will be connected via lengthy (if not tenuous) transportation lines through areas of low population/development.

In addition, transportation should take advantage, at least during initial build up of a region, of pre-existing routes (e.g., notably navigable rivers and streams) where and whenever possible; however, any links in this system that are deemed too costly in terms of effort or time will rapidly be replaced by more expensive yet ultimately cost-effective point-to-point transportation routes, typically by means of outside capital.

Expectation #7, Transportation Services: Early placer mining transportation services should exist along transportation routes, and reflect the nature of (a) the goods and services used by that route, (b) the nature of the commodity (bulk, perishability, size) should be reflected in the nature of the settlement system (e.g., locations and presence of activities related to extraction, initial and any further refinement of the product, packaging, and shipping, as well as (c) the physical/environmental limitations of the route relevant to contemporary technology. Settlements and sites will correspond to any Intermediate Transfer Points situated at points in the supply network where change in mode of transportation is required, along with any Intermediate Supply Points, those that service the needs of either a means of transportation or its employees or passengers, located along the lengthy transport routes between concentrations of developed areas.

Specific features and activities related to actual mining extraction activities should not be reflected at these transportation-related sites.

Intermediate Transfer Points will exhibit a variable layout pattern, either linear along one route, or "converging" where more than one route intersect. Increases in population in either situation should result in either continued lineal build up along the transportation route, or parallel development away from immediate access to the route. In either of these cases, decisions will likely be guided by context-specific variables, not least of which will be local topography. If more than one structure, Intermediate Supply Points would likely present a cluster (i.e., concentrated, but non-gridded) adjacent to the transportation route.

SUMMARY

In this chapter I reviewed two basic types of models, Self-Sufficiency and Dependency models. More applicable to placer gold mining systems, Dependency Models typify systems characterized by: superficial economic, political, and/or social change in the "peripheral" zone, or area of migration or colonization relative to the "core" area from which the migration derived from; change caused by external factors or factors common to both internal and external environments; many interacting links between a "core" area and the "peripheral" area (i.e., a low degree of insularity, c.f., Steffen 1980); an extractive economy where commodities, whether animal, vegetable or mineral, are shipped out from a "peripheral" area to a "core" area, and manufactured commodities are shipped in; an often short-term settlement and fluctuating settlement system; and economical specialization.

Subsequently, additional historical literature dealing with extractive economies, and/or turn-of-the-twentieth century North America, and/or (gold) mining settlement and transportation systems were reviewed. The discussion combines information from a variety of disciplines, such as economics, geography, history, and archaeology, and ranges from generalized, theoretical topics (e.g., Dependency Models, Central Place Theory; Punctuated Equilibria), to more particularistic data dealing specifically with other gold mining systems in western North America (e.g., "patchy" gold sources; settlement layout patterns; settlement functions).

Finally, a series of seven "Expectations" regarding early placer gold mining settlement and transportation systems were formulated, based upon the preceding background discussions. The expectations deal with various aspects of the initial and early development of mining settlement and transportation systems at various spatial (e.g., settlement; mining district; regional Alaska) and temporal scales. In general, the expectations relate to: the core-periphery extractive economy relationship between a "peripheral" area (i.e., Alaska) and its "core" or homeland (i.e., the United States); the nature of settlement and transportation fluctuations through time; placer mining settlement hierarchies, including functional and temporal changes; individual settlement development and internal dynamics; the relationship between the resource base (i.e., gold), and mining district and regional-wide settlement and transportation patterns; the settlements associated with the mining transportation-supply system; and technological homogenization. The characteristics of the expectations were drawn from other studies where the primary research method was mainly inductive generalizations through comparative analysis.

The goal of these efforts is to assess what variables and processes influence the initial development and spread of mining settlements and transportation systems. More importantly, I then wish to examine how these variables and processes interact in specific historical settings, whether they are even applicable or not in certain settings, and what other variables are involved not predicted by the expectations. Chapter 5 assesses these expectations in relation to Alaskan economics, and specifically to placer gold mining in interior Alaska, at the turn of the twentieth century.

CHAPTER 5

ASSESSING THE DEPENDENCY MODEL FOR AN EARLY PLACER GOLD MINING SETTLEMENT SYSTEM

In this study I am interested in the "early" development of placer mining settlement systems in interior Alaska, and the transportation networks developed to support those operations. What I mean by “early” is the first introduction and subsequent initial development of gold mining in previously un-mined region. The term “frontier” has been purposely avoided, owing to the non-systematic use of this term and the diversity of subjective criteria used when dealing with it by previous researchers (e.g., Billington and Ridge 1982; Forbes 1968; Lamar and Thompson 1984; Limerick 1987; Miller and Steffen 1977; Savage and Thompson 1979; Turner 1894; Walsh 1981; Wells 1973). Seven expectations regarding early placer gold mining settlement and transportation systems were presented in the last chapter. Different temporal and spatial parameters are required to assess these expectations, depending upon the specific expectation being discussed. Thus, prior to evaluating each of the seven expectations below, I need to establish and explain the temporal and spatial parameters used in this settlement system part of the study.

SPATIAL AND TEMPORAL PARAMETERS OF THE STUDY

Spatial Parameters

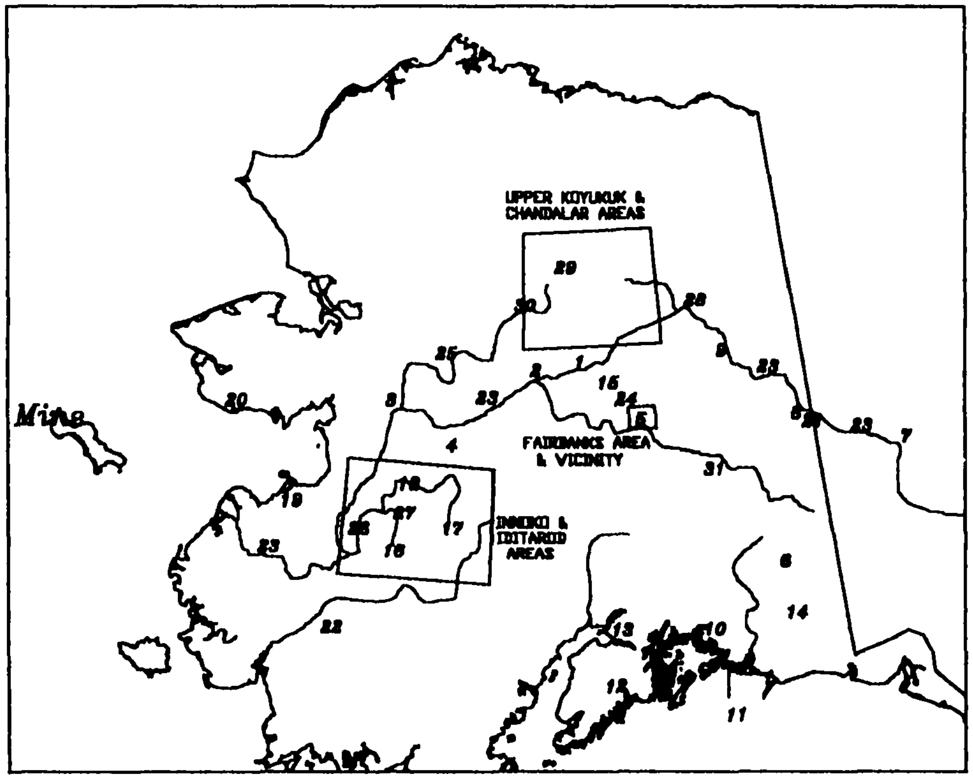
As above, different spatial parameters are used, when appropriate, depending upon the nature of which of the seven expectations is being evaluated. The entire state of Alaska is examined when assessing expectations which required a regional perspective. When considering expectations that operate at the mining district level in interior Alaska, however, four districts were chosen for further consideration: the Fairbanks district, the

Koyukuk district, and the adjacent Innoko and Iditarod districts. Figure 5.1 presents a map of Alaska illustrating the locations of settlements and names of rivers mentioned in the chapter, along with the locations of three geographical "windows," or close-ups, that circumscribe areas of the districts examined in detail in the text, and which illustrate all major settlements which developed in each district.. Figure 1.1, above, illustrates the relationship between the four districts's boundaries and these "windows." The "Fairbanks Area" window encompasses Fairbanks and associated settlements and transportation routes located West and North of Fairbanks. The "Koyukuk and Chandalar Area" window encompasses most of these two mining districts, and includes all major settlements, camps, and major transportation routes into this area. Likewise, the "Innoko and Iditarod Area" window encompasses most of these two mining districts, and all major settlements and transportation routes in and out of this area. The Fairbanks district was chosen owing to its overall centrality, both functionally and geographically, to other mining districts in the Alaskan interior. The Koyukuk district was chosen because of its relative isolation, both geographically and in terms of transportation availability, and also because of the availability to undertake archaeological excavations at two of its early mining settlements. And, the Innoko and Iditarod districts because they represent districts between the other two extremes, as they are neither overly "central" nor overly isolated. They were also chosen because of the availability of brief survey and excavation data available from several of their early mining-related settlements.

Temporal Parameters

Different temporal parameters are required, depending upon which of the seven specific Expectations is being evaluated. Essentially, data are examined from ca. 1880-1950s for Alaska-wide evaluations, but focus upon ca. 1900-1920s when dealing with specific mining districts and settlements. The reasons for choosing these temporal parameters are briefly explained, below.

1 Rampart
2 Tanana
3 Koyukuk Station
4 Ruby–Poorman
5 Fairbanks
6 Chisana
7 Dawson
8 Eagle
9 Circle
10 Valdez
11 Cordova
12 Seward
13 Anchorage
14 Kennecott
15 Livengood



16 Iditarod
17 Ophir
18 Dishkakat
19 St. Michael
20 Nome
21 Fortymile
22 Kuskokwim R.
23 Yukon R.
24 Tolovana
25 Koyukuk R.
26 Innoko R.
27 Iditarod R.
28 Ft. Yukon
29 Coldfoot
30 Allakakat
31 Tanana R.

Figure 5.1 Settlements, rivers, and geographical windows mentioned in the text.

The exact timing of the "opening" or founding of a settlement or mining district is usually known, often to the precise day of the discovery and subsequent stampede and rush. We know that mining dramatically increased in scope in interior Alaska post-1896, that is, following the Klondike strike in neighboring Yukon Territory. Most mining districts in interior Alaska were sequentially founded and developed after this time. Transportation routes throughout Alaska, between and within each district, developed along with or immediately following the sequential placer discoveries. We know when individual settlements were founded, again, often to the exact day, and when many were abandoned in subsequent years and decades. Thus, the "opening" date of the settlements and mining districts covered in this present study are all known, and range from the mid-1890s for some of the Koyukuk settlements, to 1910 for the city of Iditarod.

However, following an initial explosive economic and population growth typical of placer gold settlements and districts, all placer gold locales everywhere undergo an eventual decrease in population and gold output. This typically occurs within a few years (or less) as the "easy paydirt" is exhausted by initially manual, non-capital intensive techniques. This transition from an initial "bonanza" or boom phase to a post-bonanza phase is not as easily determined or defined. This transition often depends upon criteria imposed in hindsight by researchers, and is typically context-dependent to each particular area or settlement, making any across-the-board definition of the "closing" of the "bonanza" phase of a settlement or mining district difficult if not impossible to define. I have chosen the 1920s as an arbitrary "closing" date for our "early" placer mining evaluations. Two events that influenced placer mining development throughout interior Alaska occurred in the late teens and early twenties: World War I, and the completion of the Alaska Railroad to Fairbanks in 1923. Previous authors have recognized these two events as important milestones in the development of interior Alaska gold mining. For example, Brooks (1909:34) discusses the "evolution" of gold placer districts in Alaska, shifting from an initial "bonanza" stage (typified by higher population, rapid commercial build-up, "constant business fluctuations," non-capital intensive, and manual yet overall low labor output) to a longer-lasting post-bonanza phase (typified by a lower population, larger and larger capital input through time, developing lower and lower grades of deposits). Interestingly, he mentions that there is a typical period of "business stagnation" between the two phases. Aside from this "stagnation," however, Brooks provides no accurate criteria for evaluating when one leaves the "bonanza" phase and enters the post-bonanza era. The transition from one "phase" to the other may be gradual, or not, and when it happens is dependent upon particular contextual circumstances occurring in a particular mining district. Overall in Alaska, Brooks (1924:11) states that this transition from capital-poor to capital-intensive placer gold mining was a gradual and smooth one, which would have continued as gradual if not for the interruption caused by World War I.

Faced with a similar situation to subdivide a temporal continuum, Sattler et al. (1994:22-36), while researching the history of gold mining in the Fairbanks Mining District, formulated a series of temporal stages: first, a High-Grade Placer Mining Context (1901-09), followed by an Early Low-Grade Placer Mining Context (1910-42; Independent Operators) and a Late Low-Grade Placer Context (1924-42; Industrial operators), and ending with a Post-World War II Context (1946-present). The basis for these divisions involves variables operating at a variety of scales: (1) the high-grade context begins with the initial discovery of profitable placers in the region (i.e., local, Fairbanks scale); (2) the high-grade context arbitrarily ends with a noticeable decrease in gold profits from early, labor-intensive techniques (i.e., local, Fairbanks scale); (3) the low-grade context is sub-divided at the date of completion of the Alaskan Railroad between Seward on the coast and Fairbanks, which ushered in cheaper freighting rates and hence the availability of heavier mining equipment (i.e., regional, Alaska scale); and (4) the low-grade context ends in 1942 when the Federal Government closed down most gold mining operations in the nation owing to World War II (i.e., national and global scale).

Thus, a variety of local to globally-scaled variables and processes have been used by past authors to differentiate stages within the historical continuum of placer mining in Alaska. In 1924, Brooks (1924) recognized at least one Alaska-wide variable (World War I), while in 1994 Sattler et al. chose instead other local, regional, and global variables, specifically using decrease of profits produced by laborious means, the completion of the Alaska Railroad, and both World Wars as key variables in their temporal breakdown. These variables were deemed appropriate owing to the specific historical context in which they were working; each setting has to be evaluated independently. As above, I have chosen to follow Brooks's (1924) and Sattler et al.'s (1994) criteria of World War I and the completion of the Alaska Railroad (ca. late 1910s/ early-mid 1920s) as arbitrary events that signal the ending of the "early" phase of placer gold settlement system in this study.

EVALUATION OF THE EARLY PLACER GOLD MINING SETTLEMENT SYSTEM EXPECTATIONS

Evaluation of Expectation #1, Extractive Economy

Again, this expectation predicts that, in general, Alaska is expected to conform to expectations of an extractive economy. That is, it should have a decreased level of "insularity" accompanied by no fundamental social or political change relative to the standards of the homeland. Moreover, it should have close and extensive social and economic ties to a colonizing "core" or homeland, a heavy reliance upon material imports from its principal "core" country is expected, and it should export an over-abundance of "extractable" resources to the "core."

Referring back to Steffen's (1980) dichotomy between "fundamental" changes occurring in Insular frontiers, and only "superficial" changes associated with Cosmopolitan frontiers, we see that no "fundamental" social or political changes are undertaken, with respect to the United States, by the influx of Euroamericans that entered Alaska prior to, during, or after the major placer gold rushes at the turn-of-the-twentieth century. In fact, just the opposite is seen. With the establishment of isolated mining "colonies" (e.g., Nome, Fairbanks) and military posts (e.g., Fort Egbert, Eagle; Fort Gibbon, Tanana; Fort Davis, Nome; Fort St. Michael, St. Michael; Fort Liscum, Valdez; Fort Seward, Haines) throughout Alaska during this time, it was deemed essential that a means of communication faster than waterborne-craft be established. As a result, the Washington-Alaska Military Cable and Telegraph System (WAMCATS) was constructed by the United States Army's Signal Corps. The inter-Alaska land-based telegraph part of the system was built between 1900 and 1903, and the submarine cable connecting Sitka with Seattle was finished in 1904 (Quirk 1974), thus completing the coveted all-American communications link between this peripheral frontier and its core. Ultimately, the entire system would consist of 4,136 miles of telegraph and underwater cable lines linking all major settlements in Alaska with Seattle (see WAMCATS in Figures 5.2-5.5).

What is also significant for our present purposes is the encouragement and use of the line for non-military, personal and economic purposes. In addition, the line was maintained by small detachments of the Signal Corps stationed in log cabins every 40 miles along the route (Quirk 1974:7). By so doing, the Corps kept open a summer pack trail and winter sled trail system along this route, and provided a means of travel and transport, albeit limited in scope, between distant and isolated locales. New sections of line were built, and others were abandoned as alternative overland transportation routes developed (contrast Figures 5.3-5.4, emphasis on the construction of the Valdez-Fairbanks sled and wagon road). Ultimately, most of this land and sea cable system was abandoned shortly after 1910 with the establishment of wireless telegraphy stations throughout Alaska (Quirk 1974:8). By this time, however, the Alaska Road Commission, under the direction of the U.S. Army, had established and was maintaining far-superior overland transportation routes within Alaska that obviated any need of reliance upon this earlier system (see Figures 5.2-5.7 for the growth of this federally-mandated transportation system).

From the turn-of-the-century there has always been a rapid means of

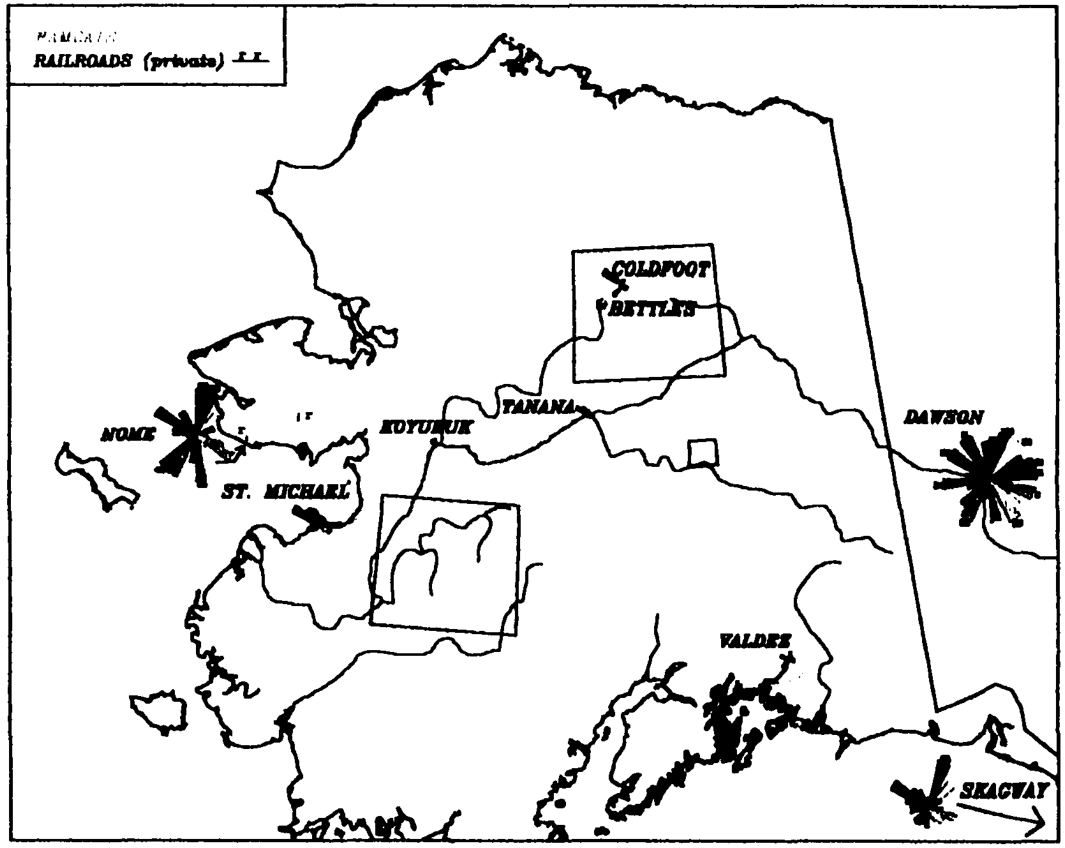


Figure 5.2 Federal overland transportation system in Alaska (ca. 1901) with select transfer/distribution settlements (ca. 1901–02). Note: The circled wedges in this and subsequent figures throughout this chapter represent (1) different types of businesses and services available in a town, as well as (2) the number of that type of service present, as protrayed by the size of the wedge. Figure 5.78 illustrates the 28 types of businesses and services portrayed by these colored wedges. These data on these figures will be referred to later when evaluating other "expectations" later in this Chapter 5.

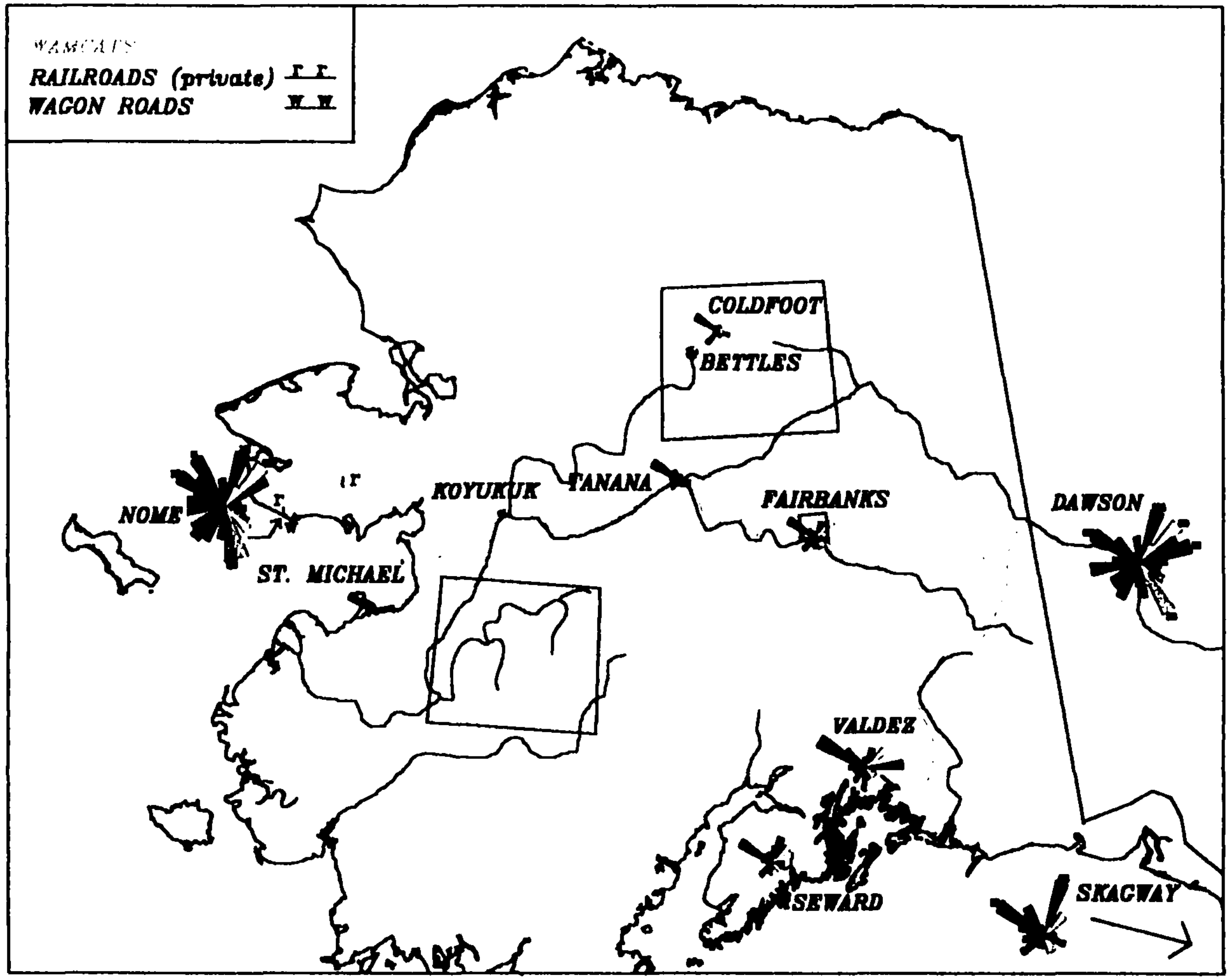


Figure 5.3 Federal overland transportation system in Alaska (ca. 1903) with select transfer/distribution settlements.

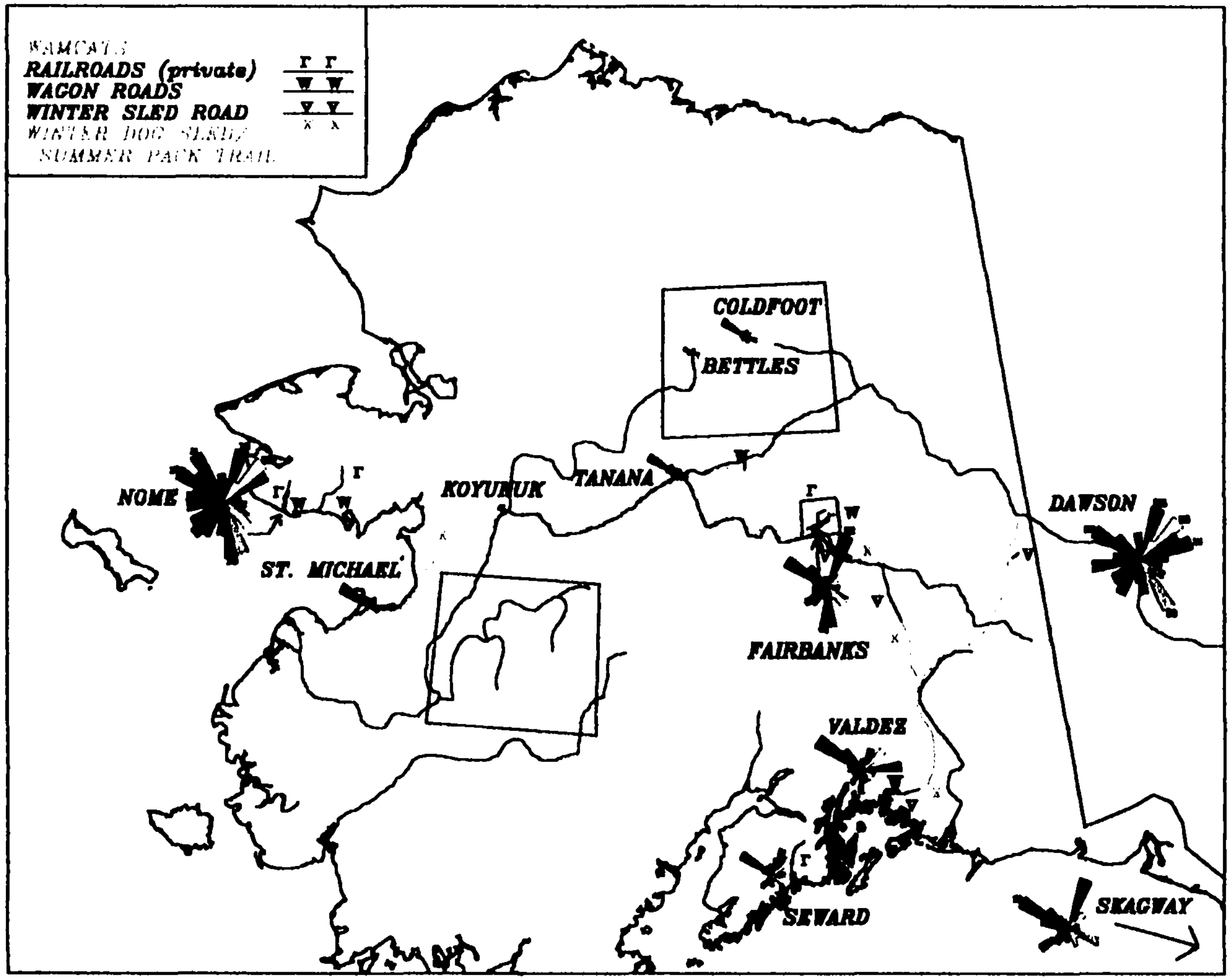


Figure 5.4 Federal overland transportation system in Alaska (ca. 1906) with select transfer/distribution settlements.

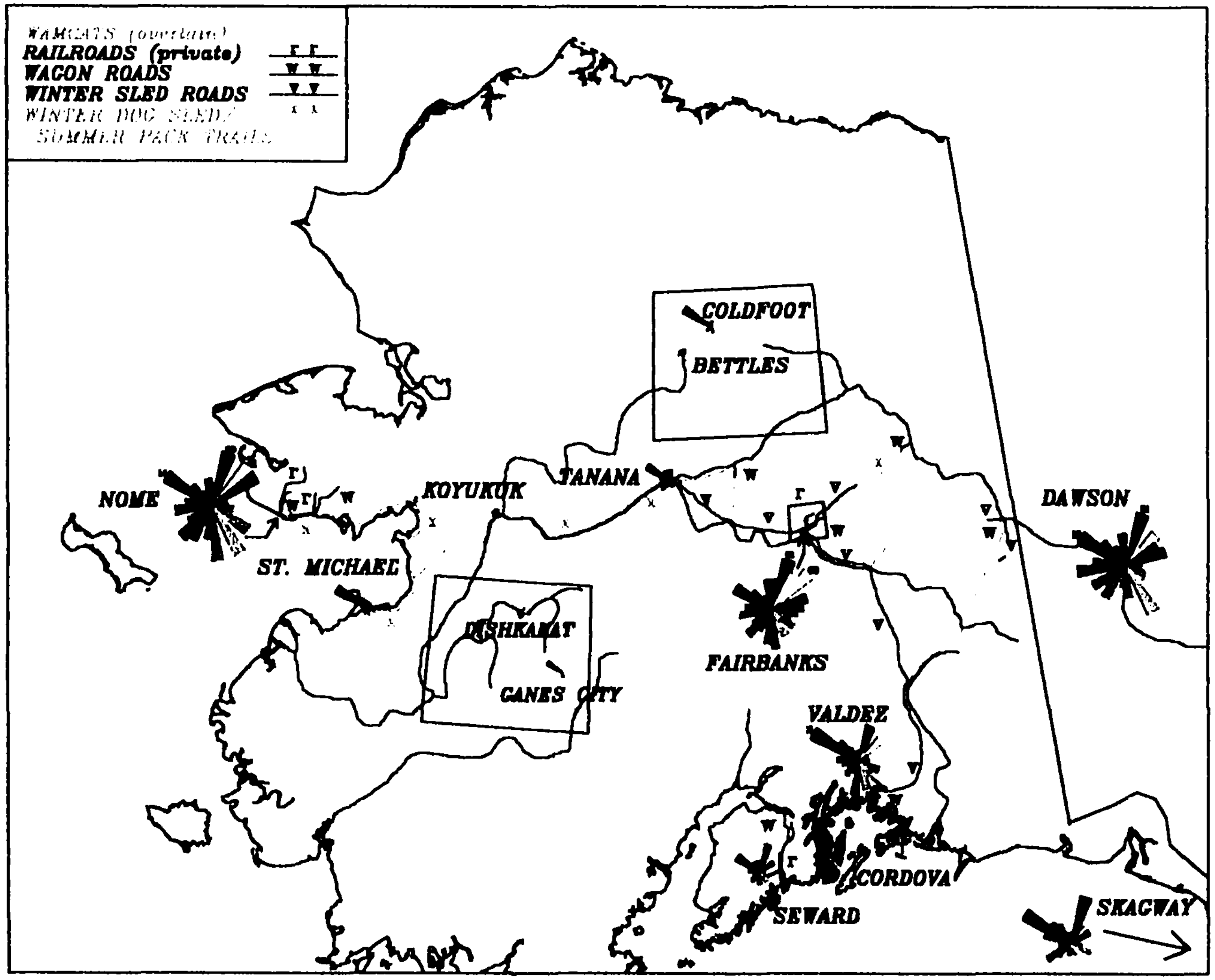


Figure 5.5 Federal overland transportation system in Alaska (ca. 1907) with select transfer/distribution settlements.

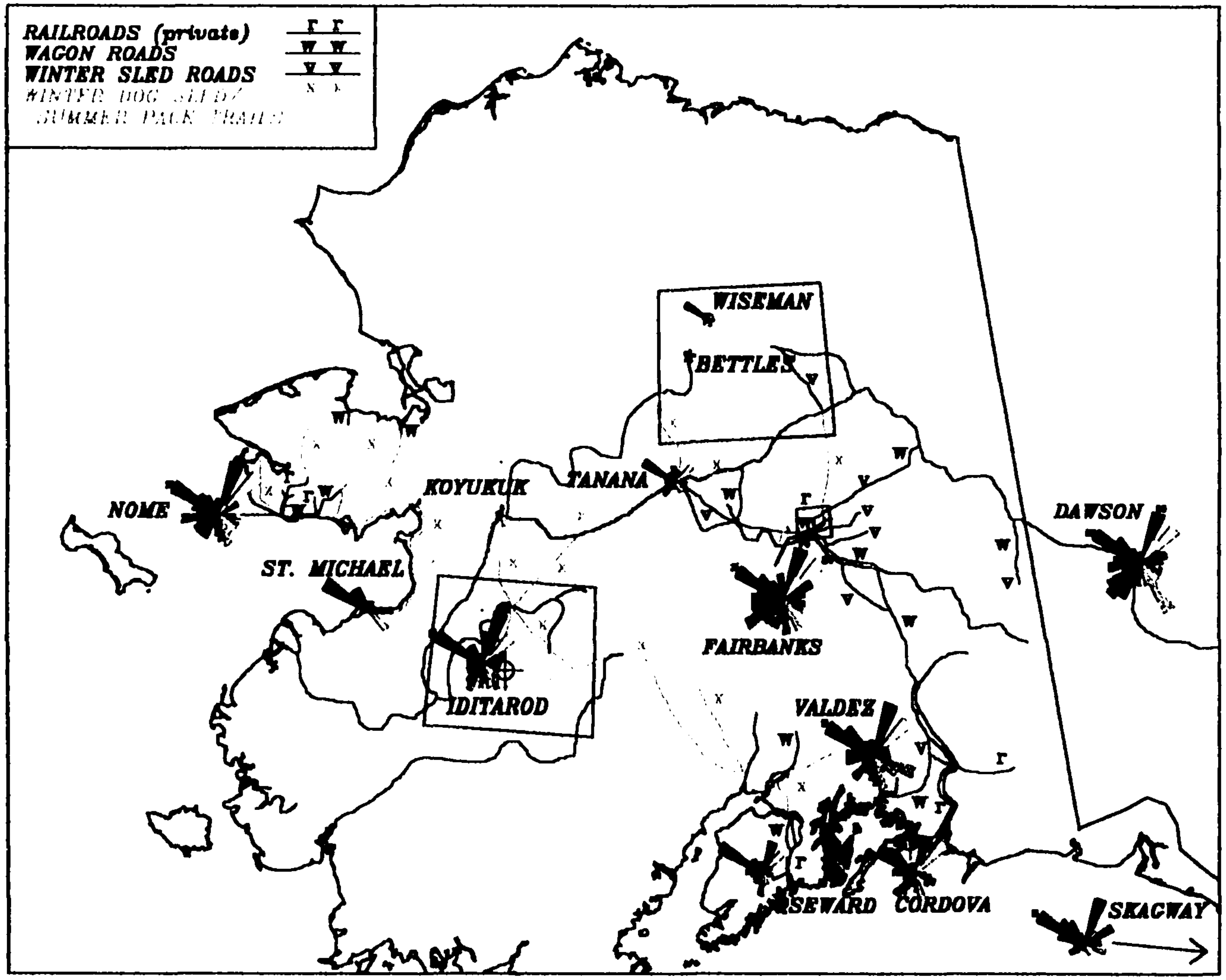


Figure 5.6 Federal overland transportation system in Alaska (ca. 1912) with select transfer/distribution settlements.

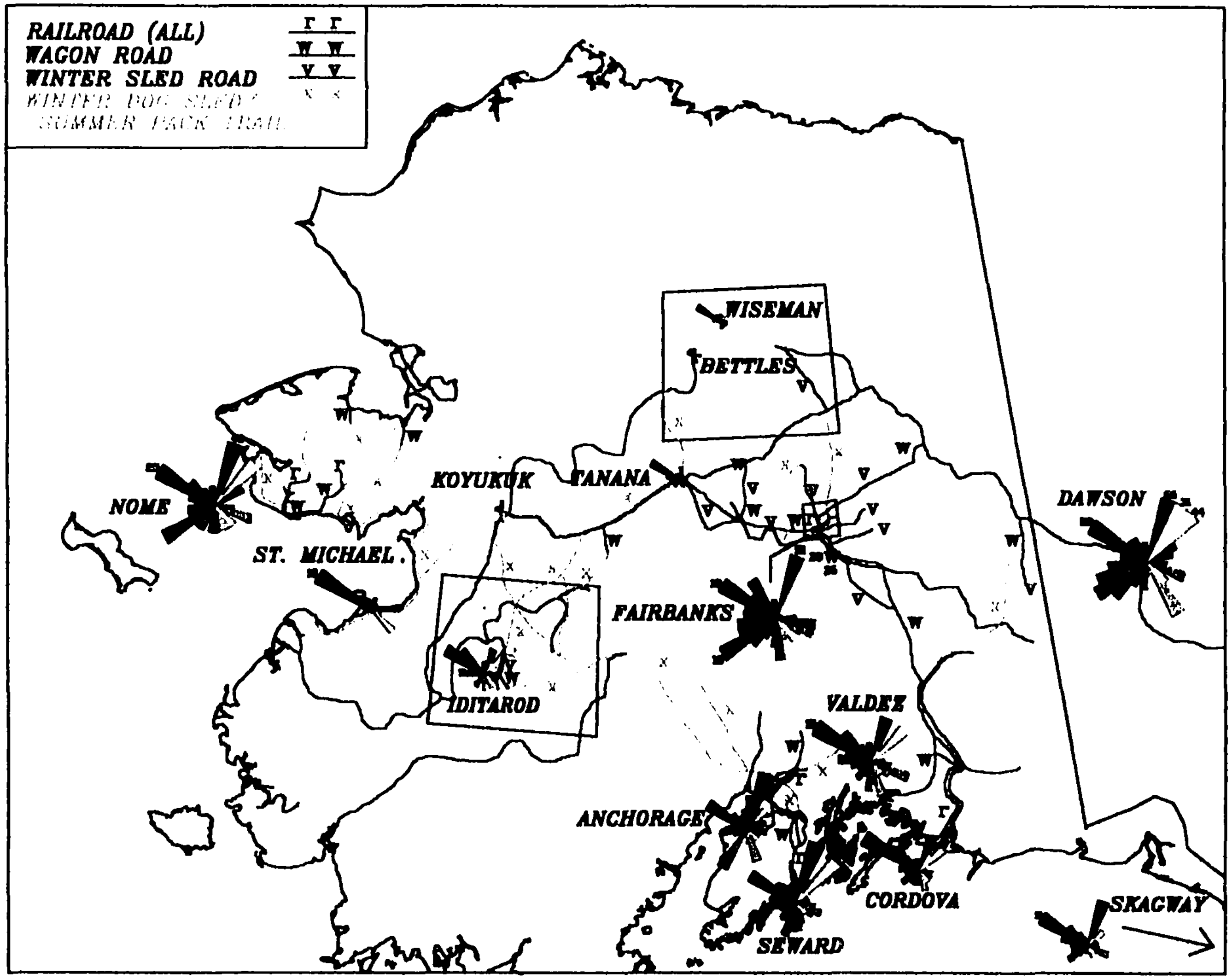


Figure 5.7 Federal overland transportation system in Alaska (ca. 1916) with select transfer/distribution settlements.

communication between the "peripheral" Alaska with the United States "core." While no military threat occurred in or near Alaska during the time frame under discussion (ca. 1890s-1920s), WAMCATS allowed a constant and rapid means of communication between any linked settlement in Alaska and anywhere in the U.S., via Seattle. This communication, along with the rapid establishment of newspapers in any sizable Alaskan community, kept the Alaskan population directly in tune with events in the rest of the nation, be it along social, economic, or political lines. In fact, Alaskans sought out ever-closer ties with the United States. Since purchase from the Russians in 1867, Alaska for the next 17 years was governed by the U.S. military, with headquarters in Sitka, southeast Alaska. However, with an ever-increasing numbers of Euroamericans entering Alaska, particularly after the establishment of the salmon cannery economy in 1878 and the discovery of sizable gold reserves at Juneau in 1880, Alaskans would press Washington, D.C. for further integration into the U.S. political sphere. These efforts culminated in the passage of the Organic Act of 1884, which recognized Alaska as a civil and judicial district of the United States. This act provided the basics of civil government, and established a governor and various judicial and administrative posts centered mostly in the southeast (Brown 1988:223-224). The Criminal Code Act of 1899 established the impaneling of legal juries in Alaska, and the Civil Government Act of 1900 extended into Alaska an Interior judicial division centered on Eagle (bringing to three the number of judicial divisions with courts and U.S. judges in Alaska), with such a judge capable of appointing U.S. Commissioners which (depending upon population size of local precinct) variously performed the duties of Justice of the Peace, U.S. Land Recorder, Probate Judge, and coroner (Brown 1988:226-227). In 1906, Alaska was granted a non-voting delegate to Congress. Ultimately, the Alaska Home Rule Act of July 1912 gave Alaska official recognition as a U.S. Territory, and established a territorial legislature (Tower 1996:198). While one of the aims of this act was to establish some measure of local rule, all of the efforts above were undertaken <u>within</u> the U.S. legal and political system, resulting in the maintenance of ever tighter bonds between the two areas. Final integration occurred on January 3, 1959 when Alaska became the 59th state of the Union.

Alaska and the U.S. have always maintained a close and extensive economic relationship, and clearly illustrate a "frontier"-"core" relationship in terms of imports and exports. Table 5.1 and Figure 5.8 illustrate the overwhelmingly lopsided importance that the United States has played in providing Alaska with material goods, relative to all foreign countries combined. As measured in dollars, the U.S. has supplied from 88.7 to 98.7% of all imports entering Alaska between 1882 to 1928. Likewise, Alaskan exports have been asymmetrically supplied to the U.S. Table 5.2 and Figure 5.9 illustrate this situation, indicating that between 85-97% of exports (in dollars) have been transported directly to the U.S., relative to foreign countries.

Archaeological data in the form of commodity sourcing also points to a U.S. dominance in imports. Of the more than 19,000 artifacts excavated in three interior Alaskan mining settlements in 1994 and 1995 (c.f., Chapter 2), spanning ca. 1900-1950s, 843 have provided brand names or makers marks from which a geographical source could be ascertained. These are laid out in Table 5.3, relative to country of origin. Twelve countries are represented, two from North America, seven from Europe, and one each from North Africa, South America and the Far East. As is evident, and comparable to Table 5.1 Alaskan imports (above), the U.S. dominates these archaeological data, providing 96% of commodities of known sources.

Alaska's Euroamerican economy has always and continues to be dominated by its extractive industries, beginning with the Russian promyshleniki, Russian American Co., and British Hudson Bay Co., and later with the United States's emphasis on aquatic and riverine furs and skins, followed in turn by whaling, walruses, cod, salmon, other fisheries, various minerals (including gold), and finally oil. Focusing specifically on the late-nineteenth and early twentieth centuries, Alaskan exports are almost exclusively extractive products. In the early 1890s, we see exports dominated by extracted goods, primarily fish products, furs/skins, and mineral output (Table 5.4).

Table 5.1 Alaskan imports from domestic and foreign sources (in dollars)*. See Figure 5.8. (Source: Rodman 1930, Tables V & VII).

	Alaskan Imports from U.S. Sources	Percent Imports from U.S.	Imports from Foreign Sources	Percent Imports from Foreign
1882-1885	680,000	98.7	9,000	1.3
1886-1890	1,456,000	98.4	24,000	1.6
1891-1895	2,422,000	98.3	43,000	1.7
1896-1900	9,843,000	98.2	185,000	1.8
1901	13,457,000	96.0	557,000	4.0
1902**	6,446,000	92.7	511,000	7.3
1903	9,510,000	95.2	477,000	4.8
1904	10,165,000	94.4	607,000	5.6
1905	11,504,000	88.8	1,451,000	11.2
1906	14,870,000	94.6	845,000	5.4
1907	18,403,000	94.2	1,134,000	5.8
1908	16,578,000	95.5	777,000	4.5
1909	17,763,000	96.5	647,000	3.5
1910	18,670,000	96.8	619,000	3.2
1911	16,206,000	95.8	706,000	4.2
1912	19,417,000	97.2	564,000	2.8
1913	20,827,000	95.5	982,000	4.5
1914	22,462,000	97.5	567,000	2.5
1915	21260000	97.1	641,000	2.9
1916	27,086,000	96.2	1,067,000	3.8
1917	38,992,000	96.4	1,470,000	3.6
1918	44,280,000	97.9	968,000	2.1
1919	37,476,000	96.3	1,449,000	3.7
1920	36,877,000	96.1	1,512,000	3.9
1921	19,274,000	95.4	935,000	4.6
1922	26,777,000	96.8	871,000	3.2
1923	30,631,000	98.3	514,000	1.7
1924	32,046,000	98.4	530,000	1.6
1925	32,352,000	97.4	847,000	2.6
1926	31,587,000	98.3	544,000	1.7
1927	35,694,000	97.9	766,000	2.1
1928	32,059,000	98.3	559,000	1.7

*Unofficial estimates from U.S. Pacific Coast ports, 1882-1901

**1902 data for final 6 months only, $3,223,000. This value doubled to produce a 12-month value for this table.

Table 5.2 Alaskan exports to United States and all foreign destinations, in dollars. See Figure 5.9. (Source: Rodman 1930, Table VII).

	Alaskan Exports to U.S. Sources	Percent Exports to U.S.	Exports to Foreign Sources	Percent Exports to Foreign
1903	10,229,000	86.4	1,612,000	13.6
1904	10,165,000	86.7	1,566,000	13.3
1905	10,801,000	90.8	1,088,000	9.2
1906	9,272,000	87.1	1,377,000	12.9
1907	12,155,000	89.1	1,490,000	10.9
1908	10,968,000	85.5	1,858,000	14.5
1909	13,111,000	93.2	961,000	6.8
1910	12,440,000	91.4	1,168,000	8.6
1911	14,055,000	92.5	1,137,000	7.5
1912	21,778,000	95.6	1,010,000	4.4
1913	24,634,000	94.3	1,478,000	5.7
1914	21,817,000	95.1	1,124,000	4.9
1915	27,442,000	96.5	1,001,000	3.5
1916	49,468,000	97.2	1,426,000	2.8
1917	60,773,000	96.1	2,475,000	3.9
1918	71,595,000	96.7	2,462,000	3.3
1919	60,479,000	97.5	1,542,000	2.5
1920	60,939,000	97.6	1,530,000	2.4
1921	36,917,000	96.2	1,445,000	3.8
1922	51,083,000	97.4	1,371,000	2.6
1923	53,761,000	97.6	1,326,000	2.4
1924	54,974,000	97.6	1,351,000	2.4
1925	56,918,000	98.4	902,000	1.6
1926	73,301,000	99.3	522,000	0.7
1927	51,349,000	99.1	483,000	0.9
1928	67,587,000	99.1	619,000	0.9

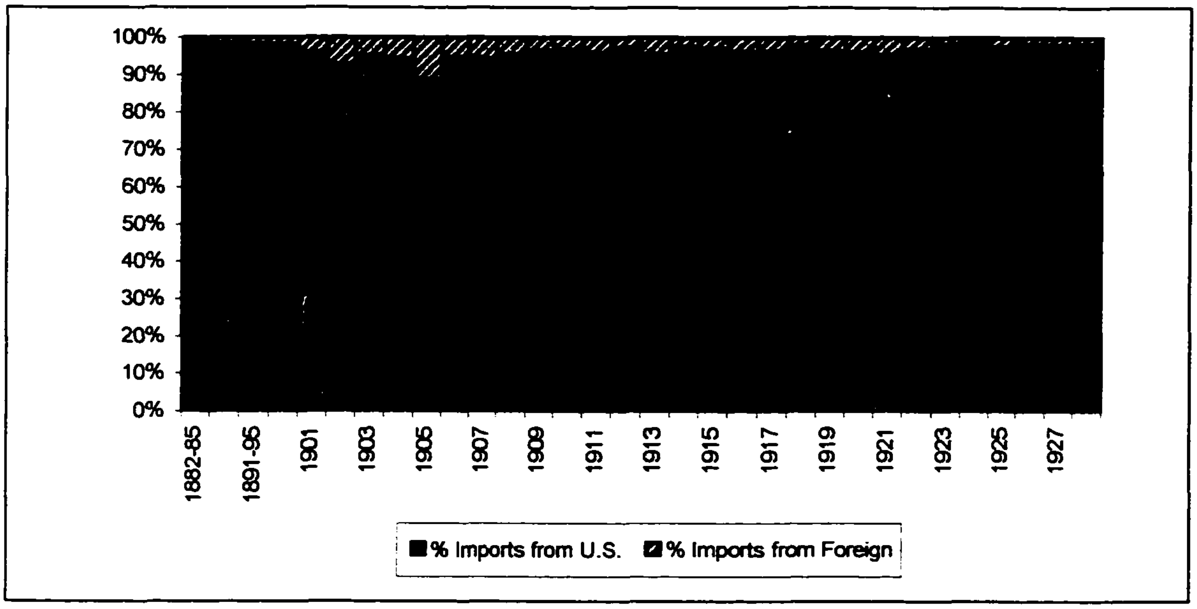


Figure 5.8 Percent of Alaskan imports (in dollars) from the United States versus from all foreign sources.

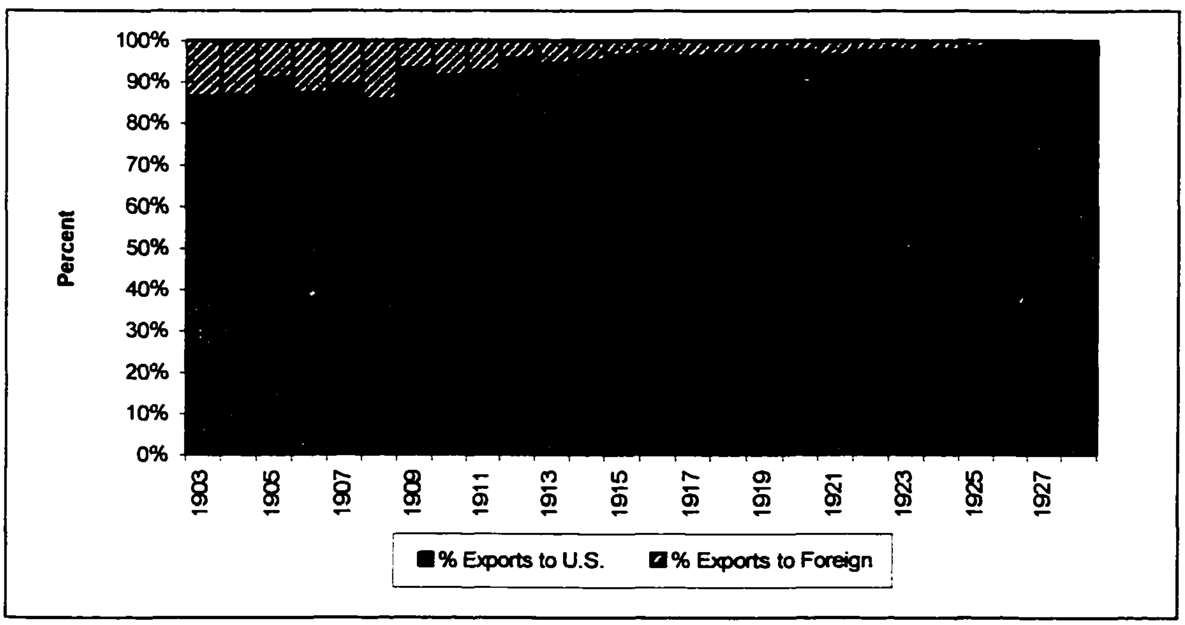


Figure 5.9 Percent of Alaskan exports (in dollars) to the United States versus to all foreign destinations.

Table 5.3 Known country of origin for archaeological commodities derived from the Coldfoot, Tofty, and Wiseman excavations.

Country	Number	% of Total
Italy	1	0.001
Egypt	1	0.001
Uruguay	1	0.001
Scotland	1	0.001
Hong Kong	1	0.001
"Choslovokia"	1	0.001
Norway	3	0.004
Canada	4	0.005
France	4	0.005
Germany	7	0.008
England	12	0.014
United States	807	0.957
Totals:	843	0.999

Table 5.4 Alaskan Exports, 1891 & 1892 (some figures estimated, as per source). (Source: U.S. Bureau of Statistics 1903, p. 113).

	1891 (in dollars)	1892 (in dollars)
cased salmon	2,753,328	3,157,176
salted salmon	73,000	81,000
codfish	569,000	375,000
ivory	9,507.50	5,000
whalebone	1,503,333	1,210,625
whale oil	4,467	103,668
Product of Killisnoo manufactory (oil; guano)	76,000	114,000
gold & silver	1,000,000	1,107,017
fur-seal skins (all sources)	2,447,880	755,587
other furs & skins (all sources)	450,000	438,991
curios, bric-a-brac	25,000	0
other products not enumerated	30,000	60,000
"furs, curios, etc. from SE Alaska"	0	351,000
Total	8,941,515.50	7,759,064

Table 5.5 summarizes these 1891 and 1892 data into five categories, based upon two variables inherent to the commodity: first, whether it is "extracted" or "manufactured," and second whether it is "consumable"/edible or non-edible. These two dichotomous variables can be visualized as a 2x2 data cell with four possible outcomes. The distinction between manufactured or "Produced Consumables" and "Extracted Consumables" is related to the "wild" versus domesticated nature of the food resource; essentially, are people harvesting a naturally occurring resource (e.g., pre-fisheries salmon; other fish and seafood; whales), or one that is managed, manipulated, and/or grown by humans (e.g., fruits, vegetables and grains agriculture; dairy products; animal husbandry)? A fifth, "Other," category encompasses items not readily definable in these terms, such as U.S. minted coins and scrap steel exported from Alaska to the U.S. (where the original manufacturing location was in the U.S.), and live animals such as mules and horses to Alaska and reindeer to the U.S. (where categories such as "manufactured" do not apply, and the work-versus-draft nature of the export is poorly understood).

Table 5.5 Alaskan exports by commodity grouping, 1891 & 1892. See Figures 5.10 and 5.11. (Source: U.S. Bureau of Statistics 1903, p. 113).

	1891	1892*
Manufactured Goods	25,000	25,000
Extracted Consumables	3,395,328	3,613,176
Produced Consumables	0	0
Other	30,000	60,000
Non-edible Extracts	5,491,188	4,060,888

*1892 "Manufactured" curios estimated from 1891, & taken from "SE Alaska." Remainder of "SE Alaska" (furs, etc.) added to Non-edible extracts.

From Tables 5.4-5.5, and their graphical representations Figures 5.10 and 5.11, we see "extracted" commodities dominating Alaskan exports in the early 1890s, just prior to the great placer gold rushes (99% of exports in both years; in dollars). Table 5.6 shows Alaskan imports from the U.S. from 1880-1890. While relative percentages in dollars or weight of the categories of goods could not be accomplished because of the lack of appropriate data (i.e., dollars; shipping weight data), it is still easy to see that Produced Consumable foods and Manufactured Products overwhelmingly dominate the imports.

Similarly, Alaskan-U.S. imports and exports for 1903, during the early Alaskan placer boom, have been tabulated using the same five categories (Tables 5.7-5.8; Figures 5.12-5.14). The pattern is identical, with Non-edible Extracted Commodities and Extracted Consumables dominating the exports (95%; in dollars; Figure 5.12), and Produced Consumables and Manufactured Products comprising 96% (in dollars) of the imports (Figure 5.13), and. A comparison of exports to imports (Figure 5.14) illustrates the stark contrast between these two fundamentally different, yet inextricably intertwined economies. These trends continued into the mid-twentieth century. Similar monetary tabulations for Alaskan-U.S. imports and exports for 1931-40 (Table 5.9; Figures 5.15-5.17), as well as for 1958 (Table 5.10; Figure 5.18), illustrate the continued reliance of Alaska upon the U.S. for manufactured and produced commodities, and dependence upon exportable extractive products. All of these data, 1891 through 1958, are summarized in Figure 5.19, and clearly illustrate the initial and continued dominance of both the importing and exporting trends discussed above.

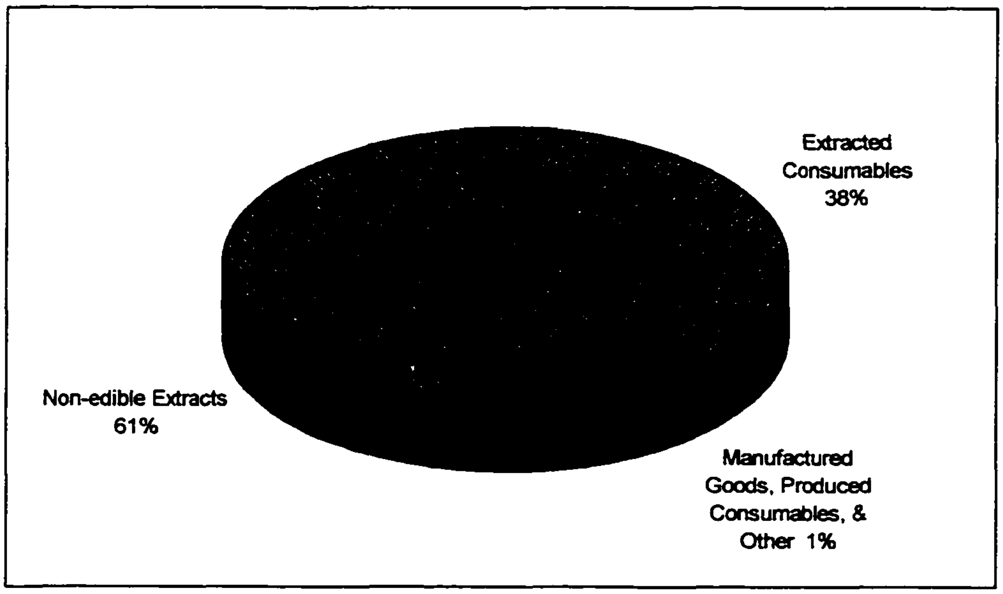


Figure 5.10 Alaskan exports to the United States (in dollars) in 1891. Note the dominance of "extracted" goods (99%), both edible and non-edible, relative to manufactured and produced goods (1%).

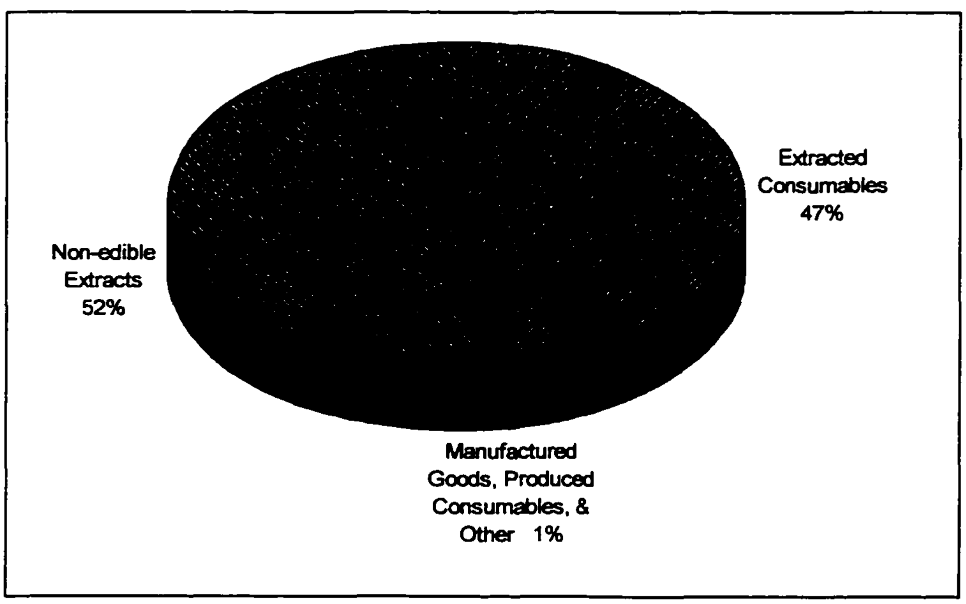


Figure 5.11 Alaskan exports to the United States (in dollars) in 1892. Note the dominance of "extracted" goods (99%), both edible and non-edible, relative to manufactured and produced goods (1%).

Table 5.6 Principal Alaskan Imports from U.S. Pacific Ports, 1880-1890. (Source: U.S. Bureau of Statistics 1903, p.114)

Article & packaging		1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890
Food & Consumables:												
Flour	barrels	6,488	6,276	7,992	5,856	7,584	11,754	9,296	9,153	10,396	11,412	14,165
sugar	barrels	1,365	1,061	1,266	1,735	1,412	952	953	1,216	1,878	1,066	1,332
butter	kegs	253	357	485	449	405	402	460	861	714	812	1,015
coffee	boxes	74	99	680	1,725	204	543	74	148	296	328	410
tea	chests	1,020	1,268	1,166	2,908	890	1,222	1,128	1,065	1,308	532	665
potatoes	bags	1,232	560	450	568	1,421	605	613	864	1,698	4,566	5,707
onions	sacks	48	105	89	40	77	50	88	93	94	285	365
other vegetables	sacks	512	550	1,264	741	1,556	1,274	929	1,578	1,844	1,846	2,507
fruits	cases	903	1,078	1,442	1,286	1,397	1,786	1,518	2,680	3,394	2,726	3,407
salt	sacks	7,656	9,342	7,734	9,297	20,494	18,206	789	12,005	20,458	19,844	23,805
salt, non-sacks	pounds	333,400	53,340	666,800	13,613	1,413,400	3,256,093	1,221,773	2,182,300	3,970,702	3,268,000	4,085,000
cigars & tobacco	packages	650	416	694	686	625	517	517	492	576	795	700
pork	barrels	85	129	181	172	273	260	226	262	498	533	666
beef	barrels	222	534	1,072	93	205	569	269	424	534	1182	1,477
misc. meats	barrels	370	501	600	516	365	188	433	454	444	213	266
soap	boxes	3,312	3,374	3,494	3,458	3,202	3,404	3,677	3,257	3,564	3,456	4,320
misc. canned goods	cases	1,288	1,798	2,917	2,506	3,037	984	2,462	3,020	3,670	3,660	4,375
canned vegetables	cases	24	4	32	165	338	152	26	80	60	224	280
canned meats	cases	0	0	0	0	0	0	0	0	0	0	2137
Manufactured Goods:												
hardware	cases	682	650	50	113	53	98	113	42	184	150	187
hardware	packages	352	574	1,125	1,085	532	508	354	954	1,836	5,826	7,282
boots & shoes	cases	392	398	570	214	284	365	353	452	577	525	656
dry goods	cases	788	618	743	308	333	444	360	378	493	629	786
clothing	cases	88	202	322	217	170	104	442	225	224	172	215
lumber	feet	809,893	629,009	496,021	590,597	384,980	407,466	634,466	945,678	1,607,792	5,578,368	6,972,960
Non-edible Extracts:												
coal	pounds	199,920	229,200	2,107,200	3,265,866	608,800	2,721,066	2,668,000	2,963,066	4,973,333	22,030,933	27,538,666
Total Estimated Value ($)		463,000	548,000	585,000	668,000	615,000	853,000	874,000	1,334,000	1,487,000	1,686,000	1,897,000

Table 5.7 Alaskan Imports from the United States, June 1902 (Source: U.S. Bureau of Statistics 1903: 115-116).

Manufactured Goods:	Quantity	Value ($)
perfumery, cosmetics		582
silk manufactures		1,659
soap		13,327
tin manufactures		420,316
toys		9,329
trunks, valises, bags		3,278
lumber boards, deals, etc. (M ft.)	12,176	146,922
wood shingles (M)	8,688	16,372
all other lumber manufactures		220,658
doors, sash, blinds		19,304
all other furniture		74,345
all other wood manufactures		153,200
wool carpets (yards)	13,895	12,044
wool flannels, blankets		8,330
wool wearing apparel		201,679
other wool manufactures		126,905
gold & silver coin		104,359
all other manufactured items		89,285
Total Manufactured Goods:		5,636,905

Other:	Quantity	Value ($)
horses	714	71,777
mules	59	5,634
Total Other:		77,411

- June 1903

Foods & Consumables	Quantity	Value ($)
"Produced"/Managed/Agricultural Products:		
all other tobacco		41,115
hay (tons)	5,812	106,362
Live Animals (consumable):		
cattle	1,089	57,493
hogs	1,083	11,471
all other animals		54,068
Total Produced Consumables:		3,192,023

Foods & Consumables	Quantity	Value ($)
"Extracted"/Non-managed/Non-agricultural Products:		
Fish:		
dried, smoked, cured (lbs)	69,959	3,518
canned salmon	10,124	943
all other salmon		1,849
other canned fish		10,598
shellfish		16,659
all other fish products		9,111
Total Extracted Consumables:		42,678

Non-edible Extracted Commodities:	Qnty.	Value ($)
timber, other unmanuf. wood		62,013
coal (tons)	56,140	256,117
quicksilver (lbs)	6,497	3,716
Total Non-edible Extracted Commodities:		321,846

Table 5.7 Alaskan Imports from the United States, June 1902 (Source: U.S. Bureau of Statistics 1903: 115-116).

Manufactured Goods:	Quantity	Value ($)
electrical		7,132
printing presses & parts		395
pumps & pumping parts		31,893
sewing machines & parts		6,061
stationary steam engine (#)	50	31,599
boilers and parts		59,437
typewriters & parts		4,063
all other machinery		498,297
nails & spikes (lbs)	898,780	29,955
pipes & fittings		160,800
all other iron/steel manuf.		218,452
jewelry, gold/silver items		24,555
lamps, illuminating items		3,794
lead manufactures		51,864
boots/shoes (pairs)	43,276	81,867
all other leather goods		24,634
marble, stone goods		3,918
matches		3,851
pianofortes (#)	44	10,541
other musical instruments		5,859
naval stores		36,996
oilcloths		14,244
all mineral, crude, natural oil (gal)	861,000	28,390
illuminating oil (gal)	353,540	70,965
other refined or manuf. oil (gal.)	307,284	60,378
all other oils		2,580
paints, pigments, etc.		27,061
paper manufactures		73,944

- June 1903 (continued).

Foods & Consumables	Quantity	Value ($)
"Produced"/Managed/Agricultural Products:		
Vegetables:		
beans, peas (bush)	9,004	17,886
onions (bush)	13,359	9,732
potatoes (bush)	110,096	68,921
canned vegetables		151,829
all other, incl. pickles, sauces		107,174
Beverages:		
bottled malt liquor (doz. qts.)	36,489	56,039
other malt liquor (gal.)	141,431	47,080
distilled alcohol (proof gal.)	993	2,092
distilled whisky (proof gal.)	42,632	104,971
other distilled liquor (proof gal.	66,071	128,944
bottled wine (doz. qts.)	1,199	11,475
other wine (gal.)	10,908	9,756
coffee (lbs)	213,052	43,951
Others:		
vegetable oil		6,337
cocoa, chocolate		4,060
eggs (doz.)	648,145	159,269
rice (lbs)	612,735	29,636
salt (lbs)	10,465,351	58,551
molasses, syrup (gal.)	36,709	18,216
refined sugar (lbs)	2,242,867	102,976
candy, confectionery		32,161
unmanuf. tobacco leaf (lbs)	22,659	3,897
cigars (M)	4,265	205,678
cigarettes (M)	780	4,460
plug tobacco (lbs)	143,897	56,296

Table 5.7 Alaskan Imports from the United States, June 1902 (Source: U.S. Bureau of Statistics 1903: 115-116).

Manufactured Goods:	Quantity	Value ($)
perfumery, cosmetics		582
silk manufactures		1,659
soap		13,327
tin manufactures		420,316
toys		9,329
trunks, valises, bags		3,278
lumber boards, deals, etc. (M ft.)	12,176	146,922
wood shingles (M)	8,688	16,372
all other lumber manufactures		220,658
doors, sash, blinds		19,304
all other furniture		74,345
all other wood manufactures		153,200
wool carpets (yards)	13,895	12,044
wool flannels, blankets		8,330
wool wearing apparel		201,679
other wool manufactures		126,905
gold & silver coin		104,359
all other manufactured items		89,285
Total Manufactured Goods:		5,636,905

Other:	Quantity	Value ($)
horses	714	71,777
mules	59	5,634
Total Other:		77,411

- June 1903 (continued).

Foods & Consumables	Quantity	Value ($)
"Produced"/Managed/Agricultural Products:		
all other tobacco		41,115
hay (tons)	5,812	106,362
Live Animals (consumable):		
cattle	1,089	57,493
hogs	1,083	11,471
all other animals		54,068
Total Produced Consumables:		3,192,023

Foods & Consumables	Quantity	Value ($)
"Extracted"/Non-managed/Non-agricultural Products:		
Fish:		
dried, smoked, cured (lbs)	69,959	3,518
canned salmon	10,124	943
all other salmon		1,849
other canned fish		10,598
shellfish		16,659
all other fish products		9,111
Total Extracted Consumables:		42,678

Non-edible Extracted Commodities:	Qnty.	Value ($)
timber, other unmanuf. wood		62,013
coal (tons)	56,140	256,117
quicksilver (lbs)	6,497	3,716
Total Non-edible Extracted Commodities:		321,846

Table 5.8 Alaskan Exports to the United States. June 1902 - June 1903. See Figures 5.12 and 5.14. (Source: U.S. Bureau of Statistics 1903: 115-116).

I. Manufactured Goods:	Quantity	Value ($)
books, maps, engravings, ...		
etchings, other printed materials		8104
cotton manufactures		7495
fibrous, grass manufactures		9915
iron & steel manufactures		420781
boots & shoes (pairs)	1,878	103,552
wood manufactures		35,740
wool clothing		22,580
Total Manufactured Goods:		608167

II. Non-edible Extracted Commodities:		
Bones, hoofs, horns, etc.		2,130
copper (& manufactures)		100,599
fertilizers (likely guano) (tons)	668	16,838
furs and skins		673,606
animal & fish oil (gal.)	202,376	29,311
whalebone (lb)	34,407	115,994
gold ore		4,719,579
Total Non-edible Extracted Commodities:		5,658,057

III. Foods & Consumables		
A. "Produced"/Managed/Agricultural Products:		
meat & dairy products		2,040
distilled spirits (proof gal.)	482	1,466
Total Produced Consumables:		3,506

B. "Extracted"/Non-managed/Non-agricultural Products:		
dried, smoked, cured fish (lb)	3,121,508	97,053
canned salmon (lb)	115,701,931	8,410,931
all other fish & products		4,658
Total Extracted Consumables:		8,512,642

IV. Other:		
Animals		2,618
"all other articles"		122,809
gold & silver coin		34,999
Total Other:		160,426

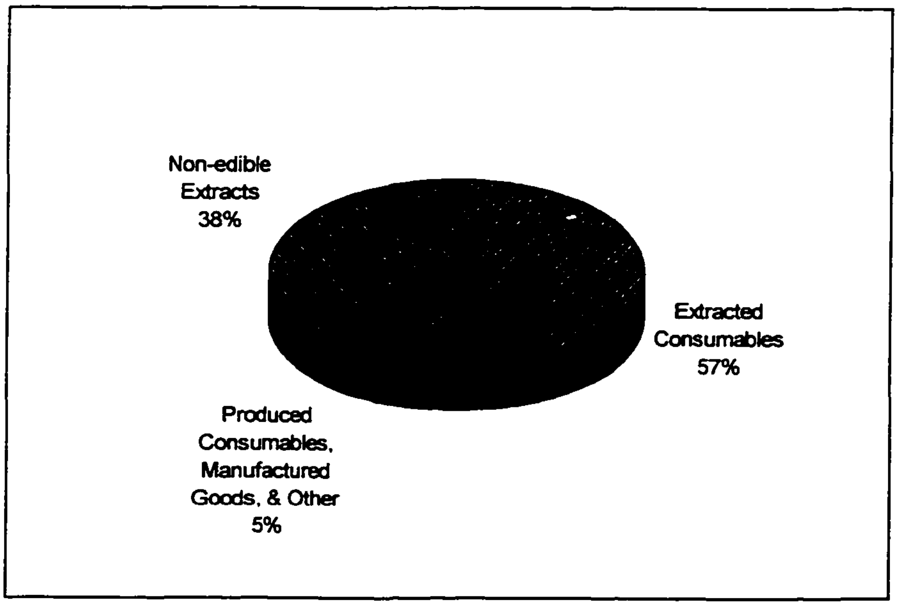


Figure 5.12 Alaskan exports to the United States (in dollars), June 1902-June 1903. Note the dominance of "extracted" goods (99%), both edible and non-edible, relative to manufactured and produced goods (1%).

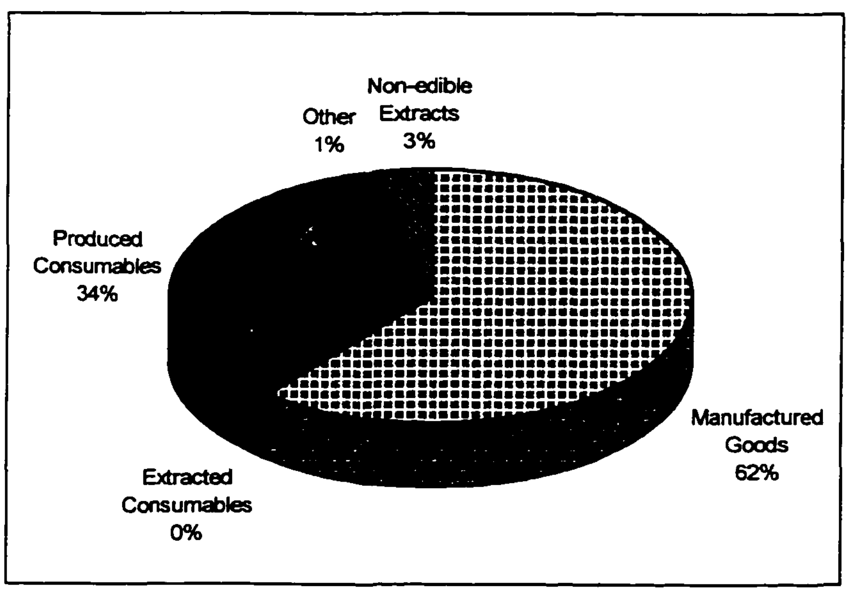


Figure 5.13 Alaskan imports from the United States (in dollars), June 1902-June 1903. Note the dominance of manufactured and produced goods (96%), relative to all else (4%).

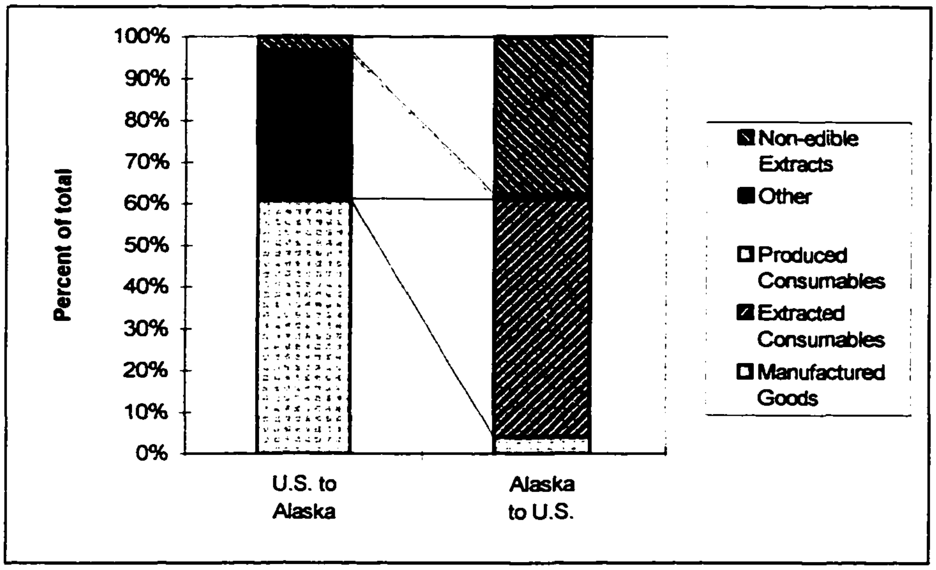


Figure 5.14 Alaskan-United States exports and imports (in dollars), June 1902-June 1903. Note typical trading relationship between "periphery" (extracted products) and "core" (manufactured and produced products) areas.

Table 5.9 Alaskan-United States exports and imports (in dollars), 1931-40 averaged. See Figures 5.15, 5.16, & 5.17. (Source: Fisher 1943, Appendix).

	U.S. to Alaska	Alaska to U.S.
Manufactured Goods	25,063,777	41,961
Extracted Consumables	218,410	38,063,006
Produced Consumables	8,790,016	43,800
Non-edible Extracts	293,369	21,077,894
Other	0	50,728

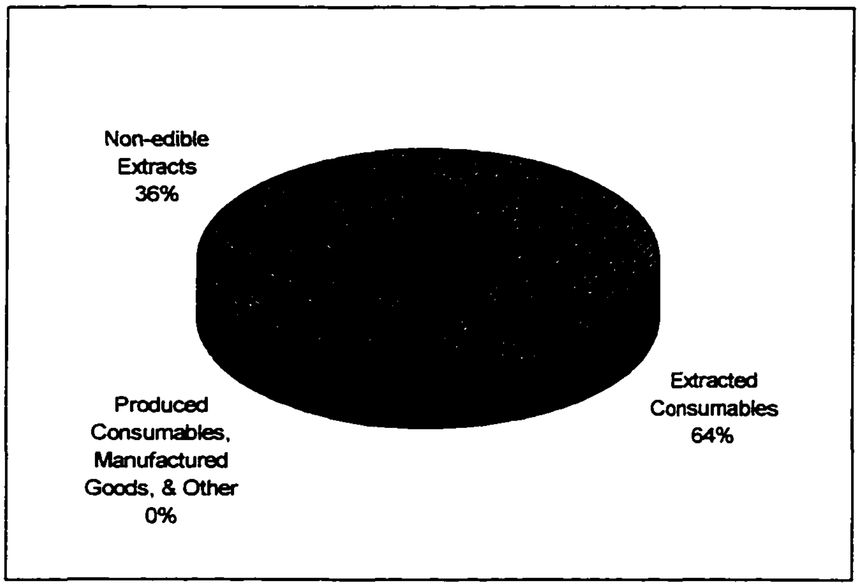


Figure 5.15 Alaskan exports to the United States (in dollars), 1931-1940 (averaged). Note the dominance of "extracted" goods (>99%), both edible and non-edible, relative to manufactured and produced goods (<1%).

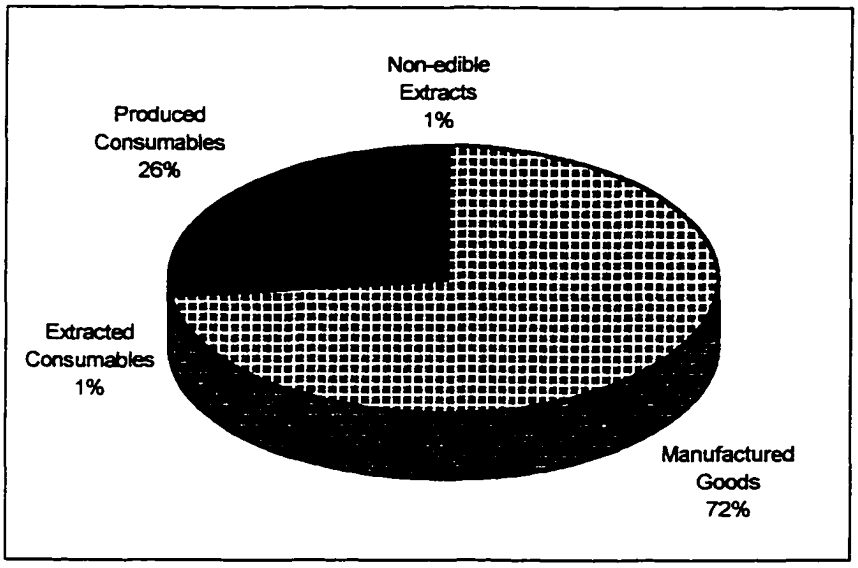


Figure 5.16 Alaskan imports from the United States (in dollars), 1931-1940 (averaged). Note the dominance of manufactured and produced goods (98%), relative to "extracted" products (4%).

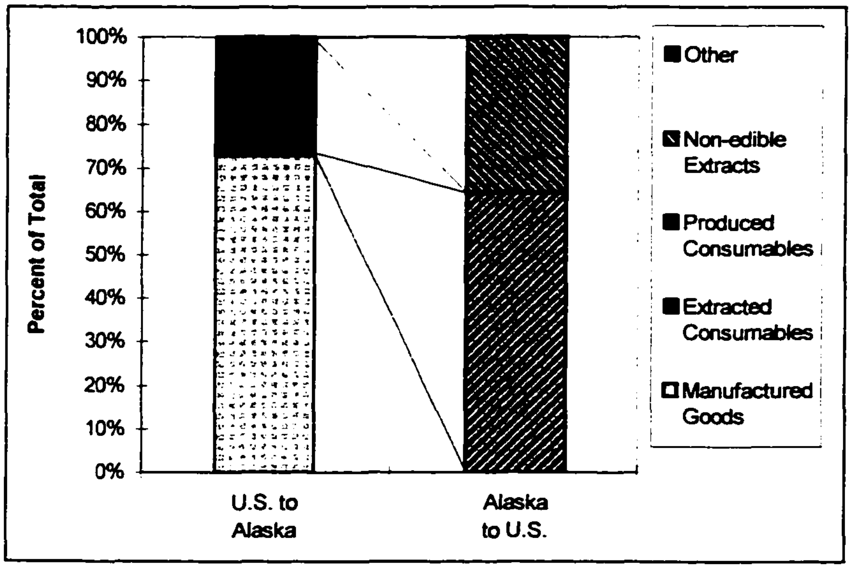


Figure 5.17 Alaskan-United States exports and imports (in dollars), 1931-1940 (averaged). Note typical trading relationship between "periphery" (extracted products) and "core" (manufactured and produced products) areas.

Table 5.10 Alaskan-United States waterborne* exports and imports (in dollars), plus precious minerals, 1958. See Figure 5.18. (Sources: Boyman 1963, Appendix B; State of Alaska 1958, Table 1 p.18).

	U.S. to Alaska	Alaska to U.S.
Manufactured Goods	82,358,774	11,163,113
Extracted Consumables	2,197	77,601,415
Produced Consumables	46,158,707	9,339
Non-edible Extracts	11,885	21,873,538
Other	0	18,272

*These data are only those shipped via ocean craft between Alaska and the U.S. After noting the absence of the precious minerals from these data, and assuming their transport via other means (overland; air), these obviously missing data were retrieved from another source.

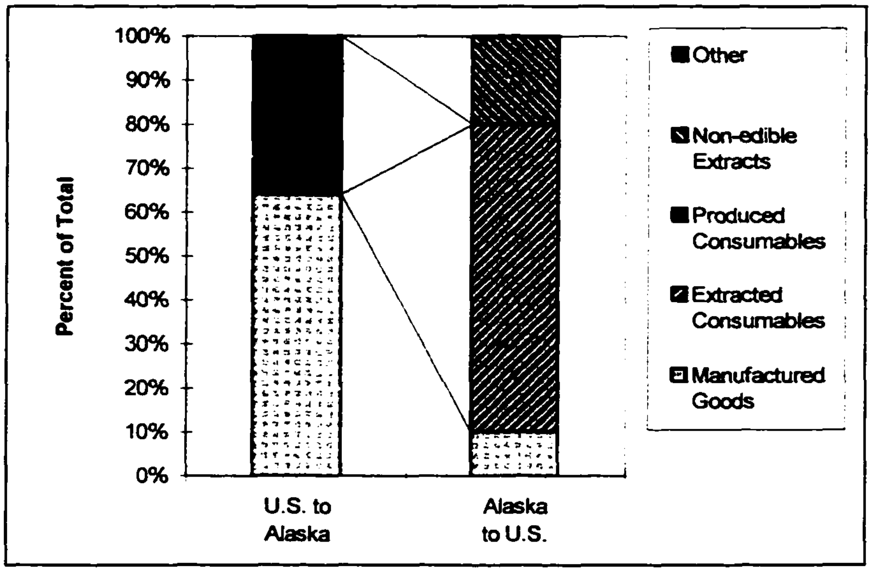


Figure 5.18 Alaska-United States waterborne imports and exports (in dollars), plus precious minerals, 1958. Note typical trading relationship between "periphery" (extracted products) and "core" (manufactured and produced products) areas.

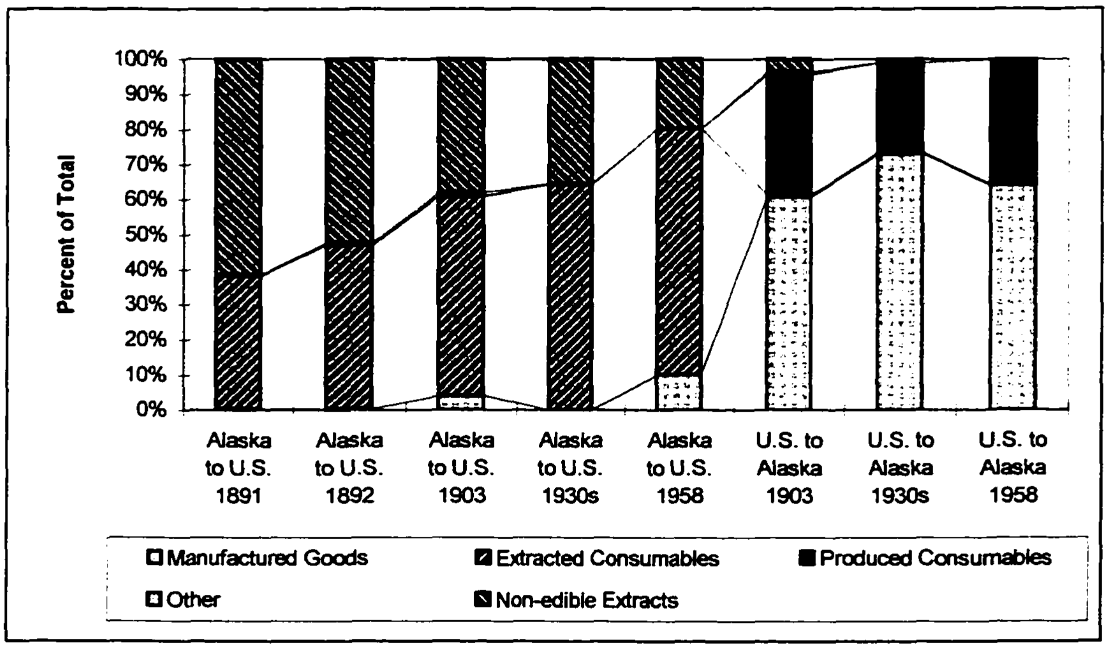


Figure 5.19 Alaska-United States imports and exports (in dollars), late-19th to mid-20th centuries. Note consistent "core"-"periphery" trading relationship through time.

Evaluation of Expectation #2, Settlement Fluctuations

Again, this expectation predicts that relatively short-term fluctuations (e.g., annual; decadal) in occupation, abandonment, and re-occupation of individual settlements and regions are expected, owing to high rates of population turnover. Continuous alterations to the transportation system should occur.

Viewed at an Alaska-wide scale, the population of Alaska's placer gold mining population through time conformed closely with placer gold output (Figure 5.20). At the local and district level, however, much fluctuation in population occurred. Placer mining frontier population turnover in any specific geographical or temporal setting is the result of a highly mobile population reacting to a variety of variables operating at various scales. Figures 5.21-5.24 illustrate the shifting population of the placer mining populations in the Koyukuk, Fairbanks, Innoko, and Iditarod Districts. One notices immediately the initial explosion in population typical of new placer gold discoveries and "rushes." As can be seen in the figures, during such "rush" times of high population, little actual mining is being performed. There is instead an emphasis on staking and recording mining claims,

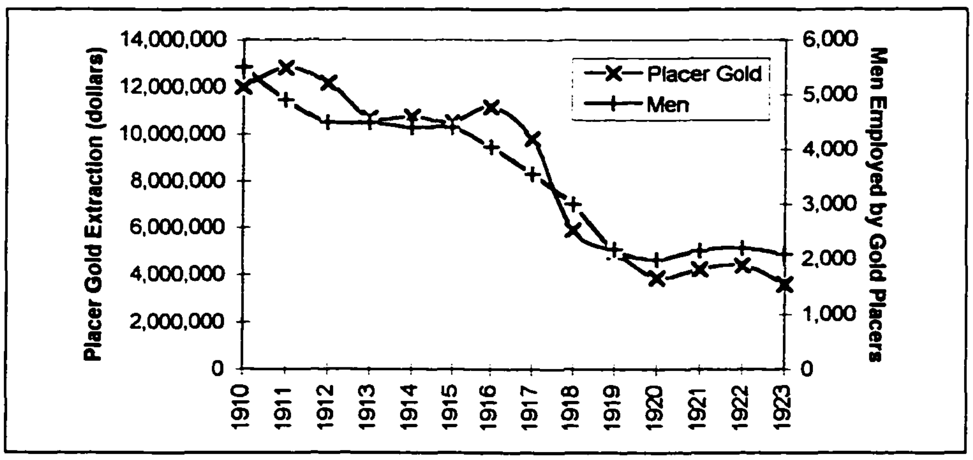


Figure 5.20 Number of men employed by Alaskan placer gold mining versus amount of placer gold extracted.

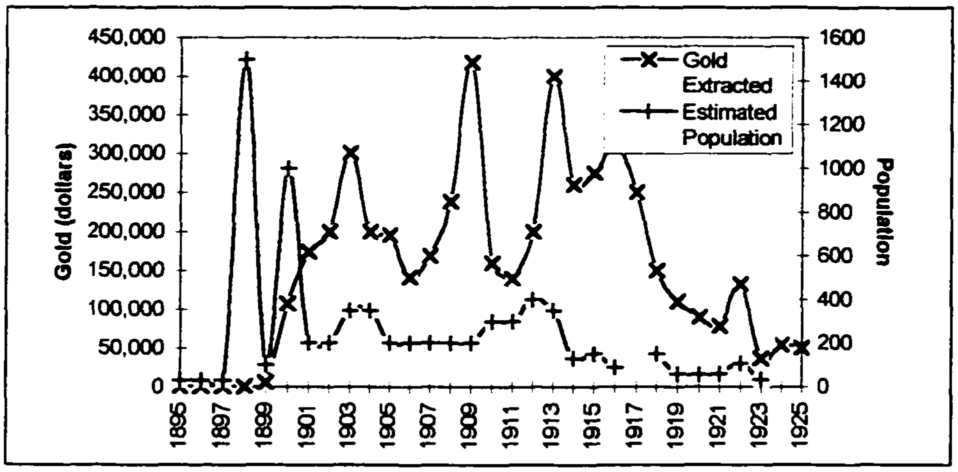


Figure 5.21 Koyukuk mining district gold extraction and population, 1895-1925. Note rapid initial "stampede" increase and decrease in population, as well as fluctuations in gold extraction following sequential strikes in this isolated district.

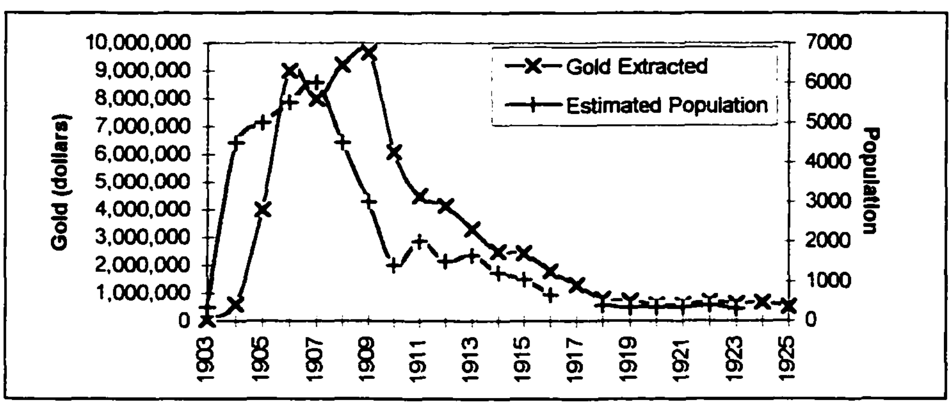


Figure 5.22 Fairbanks mining district gold extraction and population, 1903-1925. Note rapid initial "stampede" increase in population, and steady decline of population and gold extraction following the 1909 peak in labor-intensive and capital-poor extractive techniques. Population decrease may not have been as dramatic as other districts owing to high numbers of support personnel in the "central" town of Fairbanks.

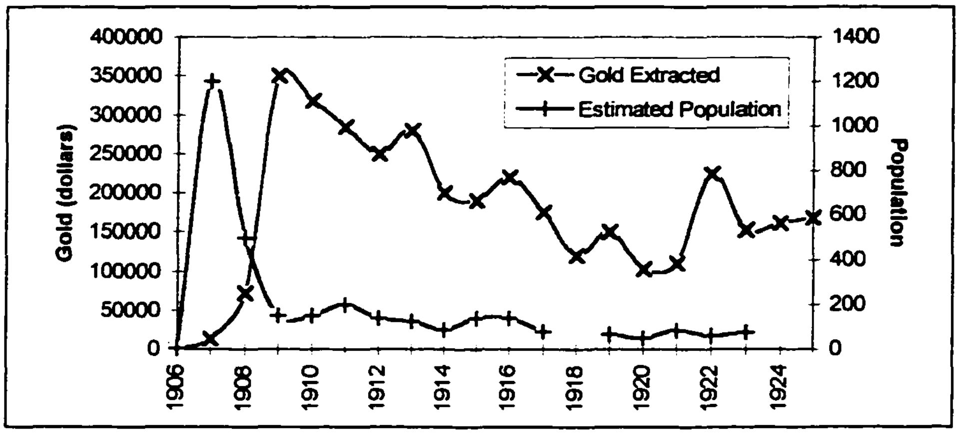


Figure 5.23 Innoko mining district gold extraction and population, 1906-1925. Note rapid initial "stampede" increase and decrease in population, and steady declines of both population and gold extraction following the 1909 peak in labor-intensive and capital-poor extractive techniques.

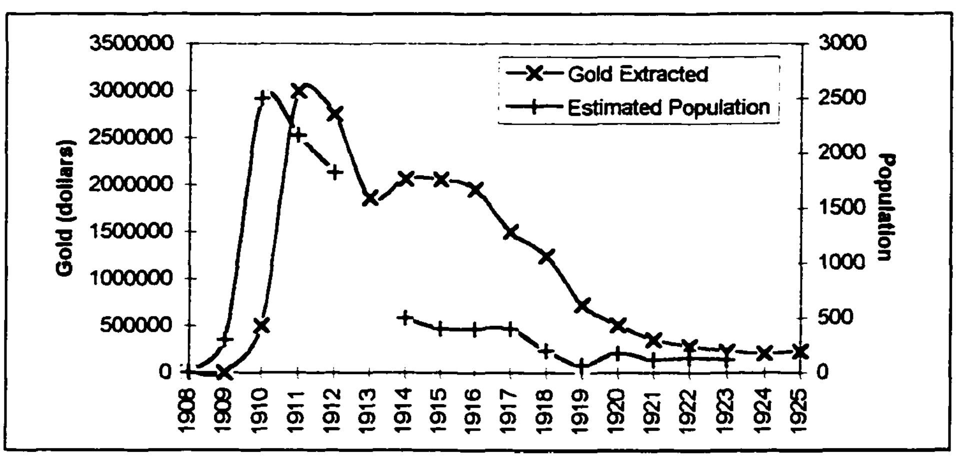


Figure 5.24 Iditarod mining district gold extraction and population, 1908-1925. Note rapid initial "stampede" increase in population, and steady decline of gold extraction following the 1911 peak in labor-intensive and capital-poor extractive techniques, despite the installing of a gold dredge the following year with up to three in 1916.

some prospecting, as well as hauling/shipping in supplies for future work. Most of the rush population is interested in staking claims in the hope that surrounding ground becomes profitable in the future, so that claims can be sold to others for a profit. After the initial rush, most of this large population might return from whence they came, this being especially true in cases where a local lack of transportation facilities equates to a lack of basic supplies. Early Fairbanks exhibited this problem, where the summer rush of 1903 almost went bust because "everybody had to scramble to exist" by supplementing what little supplies existed with locally procured natural resources (Cole 1991:63). The Koyukuk had two consecutive rushes and declines (cf. Schrader 1900; Maddren 1913; Marshall 1933/1991), the first occurred when 12-1500 prospectors "overflowed" from the saturated Yukon Klondike rush, and ascended and wintered variously along the Koyukuk drainage during the winter of 1898-99. Most of this population was associated with 53-68 iced-in steamers (Brown 1988:162, 216). During spring of 1899, the vast majority of these people left with the break-up of the river ice, leaving perhaps a hundred behind. Later that fall, word got out that payable quantities of gold had been discovered in the Upper Koyukuk, resulting in a renewed stampede of perhaps 1000 people. Similar situations prevailed after the Innoko (1907 stampede) and Iditarod (1909 stampede) strikes: a dramatic rise of population accompanying the initial "rush," with many of these stampeders forced or choosing to evacuate immediately after staking claims (Brooks 1907-1912).

Figures 5.21-5.24 illustrate patterns at two scales of analysis: first, those that are general to placer gold mining scenarios, and second those patterns that are unique to each district. Overall, the pattern evident in Figures 5.21-5.24 is that, after the initial rapid decline in the stampede population, the number of miners actually working in an area exhibits a slow and gradual decline in numbers. This overall decline owes to a generalizing variable common to gold placer districts: the eventual decline in rich "bonanza" placer deposits extractable by manual, non-capital intensive means will inevitably result in population loss. Brooks's (1915:54) report of 1914 Fairbanks presents a situation typical of many other Alaskan and Yukon placer fields: it is not so much the exhaustion of placer fields that causes the decline in overall production, but instead the loss of <u>rich</u> placers. Much low-grade placer ground remained in the diggings, but the operating costs of the time made working such ground unprofitable. Therefore, if economically feasible (directly relating to an efficient transportation means), more "mechanical" and capital-intensive means of extracting lower grades of deposits (e.g., hydraulicking; dredging) ultimately supplanted earlier "manual" and non-capital intensive means (Brooks 1921:59; 1923:5). This relationship is clearly seen in Figure 5.25, which plots overall placer production in Alaska (in dollars) against the proportion of that placer production that is being produced by capital-intensive, "mechanical" dredges. This is a

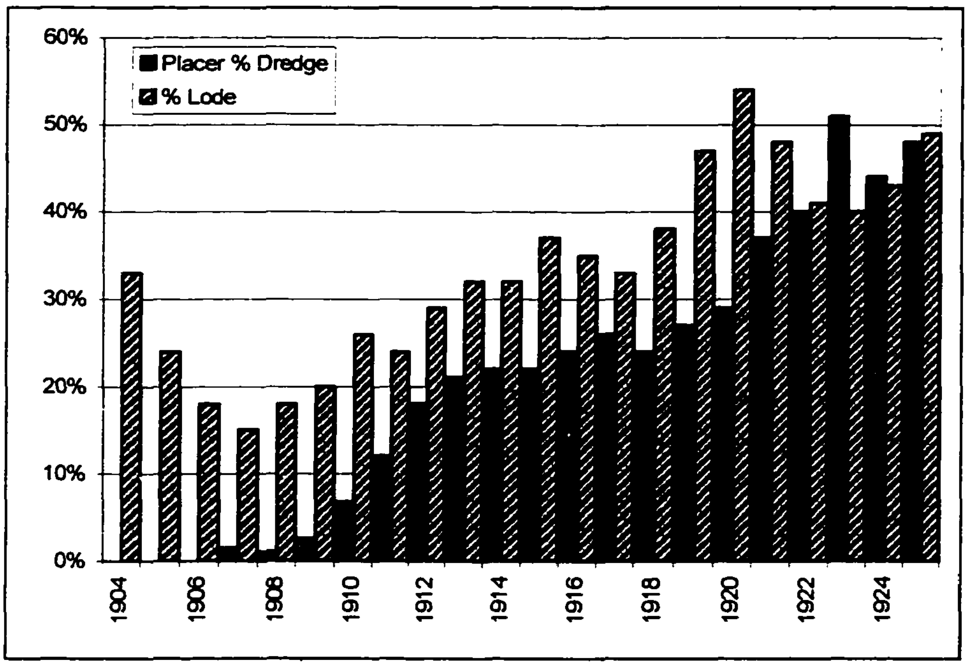


Figure 5.25 Percent of Alaskan gold produced by lode (or hard rock) sources, and percent of Alaskan placer gold produced by dredges, 1904-1925.

less workers to operate the mechanical equipment necessary to work the same area of ground. Dozens of workers could now replace the work of hundreds.

simple inverse relationship: as placer production declines, the proportion of it that is extracted by dredges increases. Importantly, Brooks (1924:11-12) also reports that operations by large companies using mechanical means of extraction will not support existing settlements founded during previous times, because such operations require many

On the other hand, whereas the same generalizing trend is evident, none of Figures 5.21-5.24 exhibit the same details (in either the population or placer production aspects portrayed), owing to historical events and occurrences unique to each particular district. Annual reports on the mineral resources of Alaska examined for this report (Brooks 1905-16, 1921-25; Martin 1918-20; Moffitt 1927) note many particular problems operating at different geographical and temporal scales that directly impacted the local population size and placer output in any specific year. Local-specific events included labor disputes (e.g., Fairbanks strike, 1907), stampedes to newly discovered diggings (thus depopulating surrounding districts of workers), low water (which could reduce by as much as half a typical year's sluicing effort), decline in available local wood supplies and the increased cost of importing other sources of fuel (a local problem felt gradually over an extended time scale), and breakdowns of mechanical equipment. Examples of regionally particular events affecting local operations might include climate fluctuations (e.g., early freeze-ups would result in lack of supplies and/or increased transportation costs to import sufficient supplies, as happened in the Innoko in 1919-20), as well as region-wide shortages of water. Globally unique events would include World War I and the immediate post-war years, which had a variety of effects that impacted local-specific placer gold operations in Alaska both during and after the war. Such effects included: (1) a shortage of labor when young men left the territory to go to war, with many who never ultimately returned, (2) post-war prosperity and high wages in the continental U.S. that attracted still more men away, (3) a reduced purchasing power of gold owing to inflated post-war prices of manufactured goods, (4) overall increased production costs in the U.S. due to increased labor costs, (5) high cost of Alaskan mining operations (supplies, wages) resulting from these factors, (6) and other U.S. industries providing better economic opportunities relative to mineral mines (Brooks 1923:5; Lantis 1948:153-154). Brooks (1921:65) reports that in 1919 alone over 1,100 men (31%) in the Alaskan gold placer mining industry left the territory.

The same factors drawing Alaska's gold placer population out of the territory during and immediately after WWI also reduced the impetus for transportation maintenance to the gold placer districts. Records of the Alaska Road Commission during the latter war years indicate a lack of commitment to maintaining much of the existing transportation system (Alaska Road Commission 1917-1920). Brooks (1921:60) comments on this situation in 1919, stating that except for construction along the Federal government railroad into the interior, from Seward to Fairbanks, and the maintenance and building of some wagon roads, the overall transportation conditions in Alaska worsened during the later war years, declining to a low point in 1919. In addition, ocean freight and passenger rates went up between the U.S. West Coast and Alaska, and Yukon River steamer service was regarded as "inadequate." This situation resulted in an overall re-assessment of the Alaskan transportation system following the war (ARC 1922-23), resulting in the abandonment of many of the lesser trails. Similar labor shortages and other problems afflicted Alaskan placer gold production during the Second World War, when much of Alaskan gold output was shut down for much of the war (Spence 1996:115-124).

How might these fluctuating processes be quantified, using historical documentation? If numbers of retail and commercial services, federal, state, and local governmental offices, numbers of transportation links, and various other social and religious functions present in a settlement can be taken as a proxy measure of population size, both in a settlement and scattered across the surrounding landscape, then their overall numerical change through time can illustrate the founding, growth, rate of growth, decline, and hierarchical relationship relative to other towns (we will return to this latter "hierarchy" aspect in of mining settlement systems in more detail in Expectation #3, below). The number of such economic, social, political, and religious "outlets" were tabulated for all significant settlements in the four Alaskan gold mining districts in this study (i.e., Fairbanks, Koyukuk, Iditarod, Innoko), all of which had placer gold origins and remained predominantly placer-oriented during the early twentieth century. For the moment, only absolute numbers of such tabulations will be considered. The circular colored wedge diagrams illustrated on the Alaskan and district-level maps presented below reflect individual numbers of 28 different types of social, political, economical, and even religious services and businesses present in settlements (see Figure 5.78 for explanation, below). In short, the larger a colored wedge, the more services of that type are found in the community at the designated time frame. This will be further elaborated upon in Expectation #5, below. For purposes of assessing the present "settlement fluctuating" expectation, spatial layout of settlement will also presently be ignored. Lastly, it is acknowledged that while the total amount of such services for any individual locality may be lower than past actuality, owing in part to incomplete reporting in the primary sources for these data (see Expectation #5 for a complete listing of these sources), it is felt that the overall patterns illustrated by these data reflect past actual relationships between the settlements, assuming the same general errors or oversights of reporting data were operating at all localities.

As outlined above (see Temporal and Spatial Scales), the districts examined are all located in the interior of Alaska, and are the Koyukuk, Innoko, Iditarod, and Fairbanks mining districts (see Figures 1.1 and 5.1). The settlements examined are those supply and distribution settlements located directly within the mining districts, not including small extractive encampments of individual miners or small groups of miners at specific extractive sites on the creeks (the Placer Mining Settlement Hierarchy is outlined in Table 5.11, and discussed in length below). Figure 5.26 outlines these data for the Koyukuk district, starting with the year the first supply post was established in the Upper Koyukuk (1893) and ranging through 1916. The settlements are arranged in order of proceding up the Koyukuk, with Arctic City being furthest downstream. In examining only the rapid

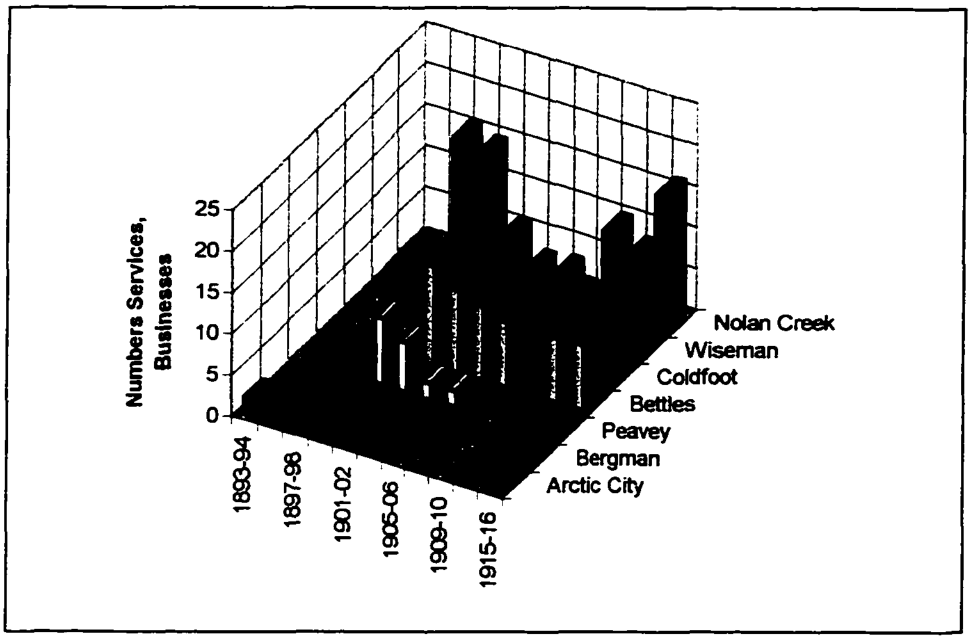
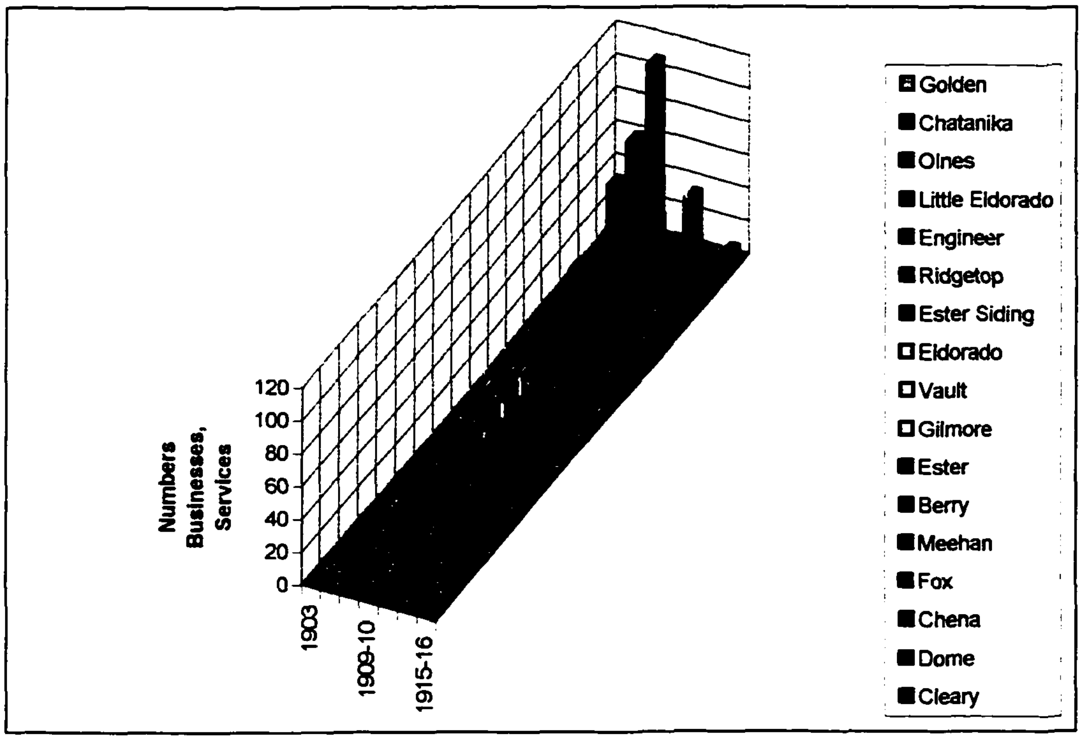
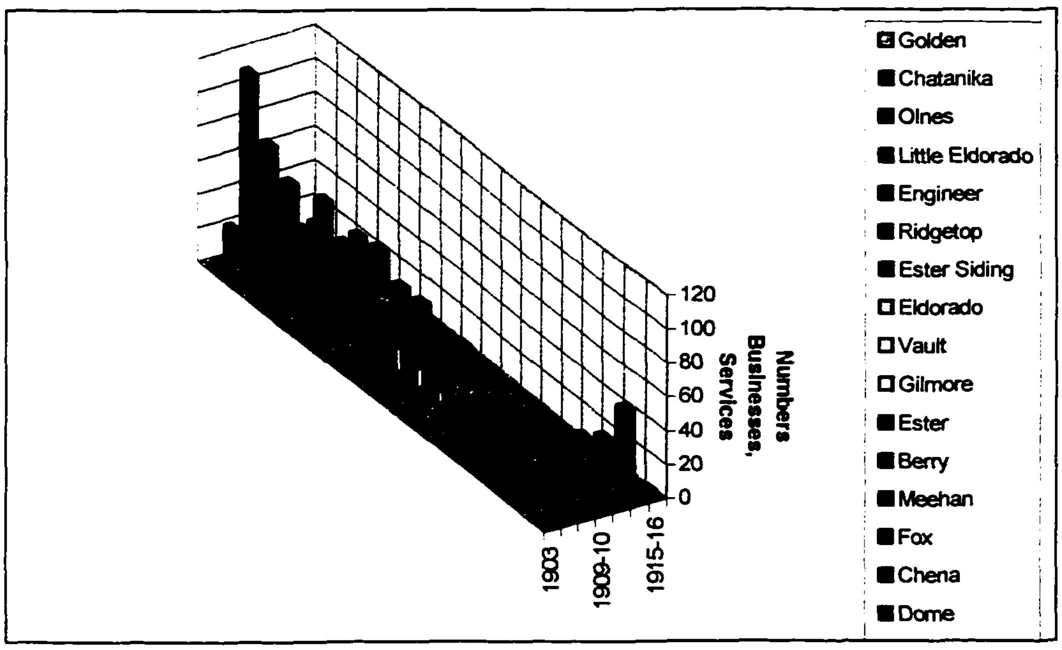


Figure 5.26 Koyukuk mining district transportation and settlement system. Arctic City furthest downstream, and Wiseman and Nolan Creek furthest upstream. Note sequential rise and decline of settlements through time further and further upstream.

"fluctuating" nature of placer settlements (we will return to the relationships between the settlements through time, below), we see that all settlements within this placer gold district portray a rapid build-up and/or decline in available services. Arctic City, Bergman, and Peavey all come and go in 6-8 years (in terms of services; it is believed that continued native habitation of these sites persisted, at least sporadically, for additional years thereafter). Within a thirteen year span (1893-1905), we see the founding of six transfer or mining distribution towns and the abandonment of three of them. In addition, at least five other "towns" in the Upper Koyukuk drainage were occupied by hundreds of other prospectors during the winter of 1898-99, only to be abandoned immediately after spring break-up (Soo City, Seaforth, Jimtown, Rapid City, Beaver City; see Figure 5.55, below).

The Fairbanks mining district also illustrates a continual pattern of short-term fluctuations, particularly in the smaller gold towns supplied by, and north of, Fairbanks (Figures 5.27a-b; 5.28). In 1903, the summer of the first significant stampede, the only





Figures 5.27a and 5.27b (reverse side). Fairbanks mining district major secondary distribution towns, 1903-1916. Note rise and decline of settlements, particularly peaking at ca. 1908.

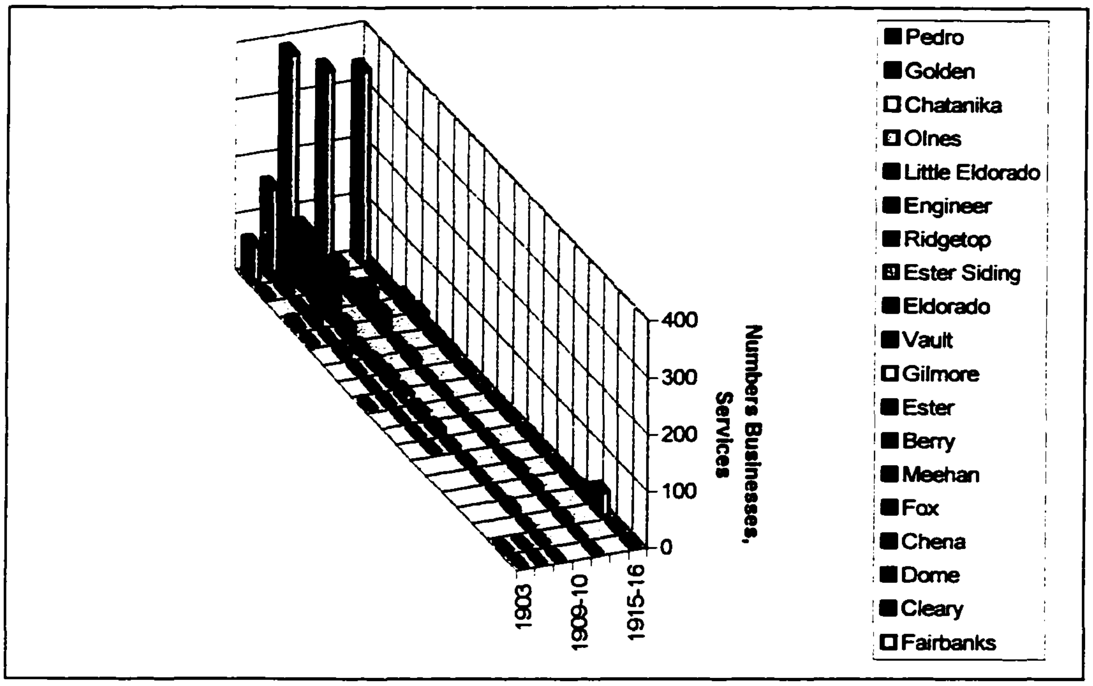


Figure 5.28 Fairbanks mining district transportation and settlement system, all major settlements, 1903-1916. Note dominance of central distribution center Fairbanks over other secondary distribution points. Note also rapid rise, and continuance, of Fairbanks.

recognized settlements were Chena and Fairbanks. By 1905-06, the number of supply towns and mining settlements had grown to <u>at least</u> twelve (including Gilmore, Golden, Pedro Camp, Dome, Vault, Meehan, Berry, Ester, Ester Siding, and Cleary), and two years later included 19 settlements. During the 13-year time range presented in these these figures, one witnesses the fluctuating nature of the settlements through time and space. The rapid growth and decline is apparent not only of individual settlements relative to each other (as populations and services fluctuated with the changing fortunes of each locality), but also of the entire district through time (peaking in placer production 1907-09; compare to Figure 5.22).

Lastly, Figure 5.29 displays data for the Innoko (Dishkakat to Innoko City) and

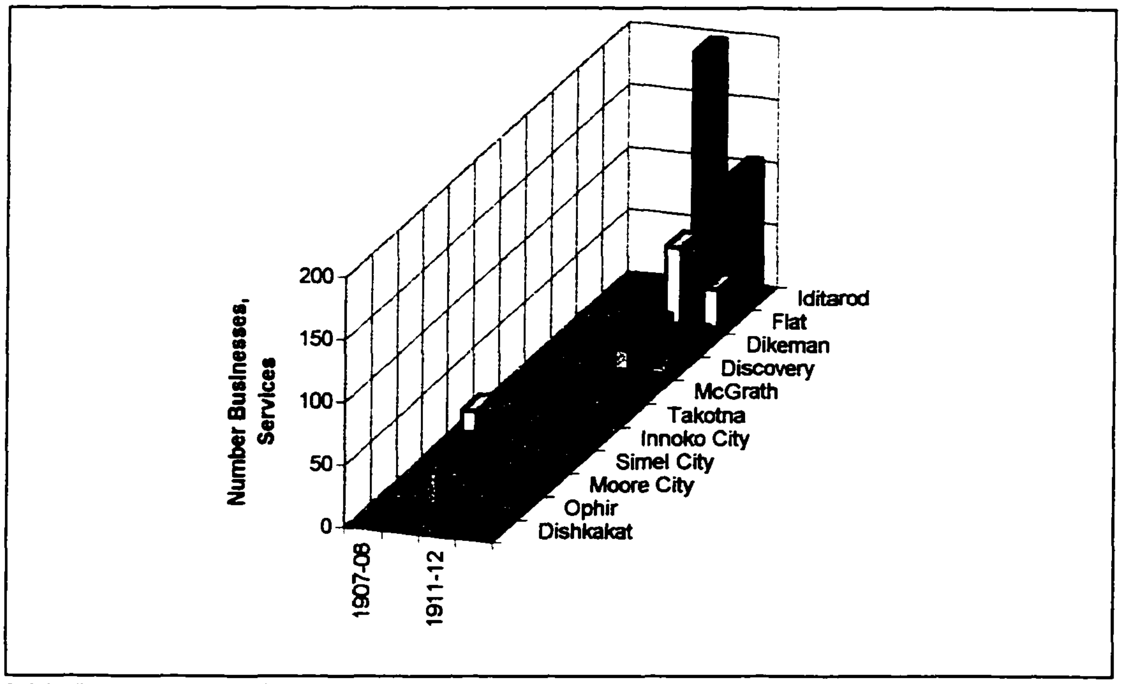


Figure 5.29 Innoko and Iditarod mining districts transportation and settlement systems. Innoko: Dishkakat-Innoko City; Iditarod: Discovery-Iditarod: with Takotna and McGrath "shared" by both districts. Note rapid rise of settlements, and early number (n=4) of competing Innoko transfer points en route to Ophir; only Dishkakat survived the first years.

the Iditarod (Iditarod to Discovery) districts, including two small late transfer points that serviced both districts (McGrath, Takotna). While data for these districts is more uneven than that for the Koyukuk and Fairbanks, relatively rapid fluctuations within individual settlements through time are still evident, particularly for the much larger Iditarod area.

Finally, in terms of alterations in the transportation system in conjunction with settlement fluctuations, the data indicate the rapid establishment of transportation means to new gold districts or discoveries, often quite expensive in nature (see also Expectation #7, below). Although building such networks occurred very rapidly, they were slow to be totally abandoned. While great fluctuations of population might occur within and between districts through time, no district was ever totally abandoned, thus pack trails, sled roads, and wagon trails continued to be used. Such overland routes were extremely expensive to build in terms of energy and money, and it was recognized early that such routes were worth the annual maintenance cost to keep them in functioning order. In particular, it seems that summer pack/winter sled dog trails were often maintained as they typically were connected to another town or native village further afield, and while placer mining might decrease in the middle of this network, it was deemed worthwhile to keep open the route between the two outer points. An example of this case might include the trails through the Innoko district, connecting Seward on the Gulf of Alaska to St. Michael and the entire Seward Peninsula (see Figure 5.7) to the northwest. While this system was maintained primarily to keep postal service operating through the winter months to these more northerly locations, it proved fortuitous when Nome was stricken with a diphtheria epidemic during the winter of 1925, when the only way to provide the needed serum was via this route (McCarley 1980; Reit 1976; Ungermann 1993).

Likewise, once quickly established the Upper Koyukuk's basic transportation network changed little for 30 years, with Bettles being founded in 1899 at the upper limits of steamer navigation on the Koyukuk River, and supplies from that point northward were drawn either on or next to the Middle Fork. Whereas methods of transport changed through time (horse-drawn scows, pole boats, and dogs sleds early on, and sled routes, gas-powered launches, and even a tractor later on in the 1920s), the route itself remained the same: on or along the Middle Fork of the Koyukuk. Transportation development through the 1920s was seen to simply improve existing routes of travel that were founded during the first few years of settlement (e.g., existing trail connections to the adjacent smaller Chandalar district to the east taken over by the Alaska Road Commission; building of tramways across streams by the ARC; improving to wagon road status routes around Wiseman by the ARC), and not substantially add new avenues (see Figures 5.54-5.62 below; see J.B. Mertie photo 1026 of 1924, U.S. Geological Society Historical Photo Library, Denver, an ARC tram at Caro 1924, in Brown 1988 photos between pp.258-259).

The Fairbanks district, too, followed a similar path, with the establishment of good wagon roads immediately after the founding of any new settlement (see Figures 5.70-5.74, below). The apparent decline of the summer pack/winter dog sled trail system post-1907/08 in these figures may be a symptom of lack of data, rather than actual abandonment of these routes. While most of the wagon and sled roads north of Fairbanks were built and maintained by the Alaska Road Commission (crude roads were built privately prior to the arrival of the ARC in the summer of 1905), most of the local sled and pack trails illustrated in these figures were apparently cleared and maintained by the populace without civil, territorial, or federal aid. In short, the exact demise of any particular trail is unknown, thus their apparent "disappearance" in the figures presented here may not reflect what actually occurred in the past. Regardless, fluctuations in the transportation did occur with the Fairbanks-area system, but largely in trail and road connections to settlements outside of this area. Data indicate that the trail/sled road route leading northeast to the Circle mining district changed through time, with a 1907 map indicating it deriving from the road that crossed north of Meehan, a 1908 map showing that it derived from Clearly, but by 1911-12 initiated from Chatanika (see Figures 5.71-5.73, below; ARC 1907-1912; Pringle 1908). The trail north to the Chandalar district via Beaver also shifted through time, initially starting from Chatanika in 1913 (ARC 1914), but later initiating from Olnes in 1923-24 (ARC 1925).

Besides the overall neglect of the non-wagon overland transport system during World War I (discussed above), the eventual demise of the inter-mining district overland pack and winter sled system occurred because of the introduction of airplanes. Commercial aviation began in Alaska in 1923 when Ben Eielson was awarded an experimental Federal mail contract. The airplane was a success, and by 1932 in Alaska there were 68 landing fields, six hydroplane ports, and 12 commercial companies operating 31 planes which had carried up to that point one-half million pounds of mail and express while flying 750,000 air miles. What might take weeks of sled travel could now be done in hours. Planes quickly became indispensable in Alaska, delivering people, freight, fresh food, and mail all year long, not only faster but cheaper, with an express rate of 1/10 cent per pound mile (McMillion 1934:185-188). By 1938, 3/4s of all interior travel in the winter was undertaken by airplane (Lantis 1948:159).

Taking the Koyukuk and adjoining Chandalar district as an example, we witness the first airfield construction in 1926 at Wiseman (then the central mining settlement in the Upper Koyukuk) one year after Noel Wien landed the first airplane in the Upper Koyukuk on a nearby gravel bar. This is followed in 1927 by one in the northern region of the Chandalar district, one at Bettles in 1928, and one at the new Bettles River mining camp northeast of Wiseman in 1929 (ARC 1926 to 30). Undoubtedly, more and more supplies and mail were taken over by this more efficient means of transportation. As a result, the ARC annual reports in the years following 1929 witness a gradual but persistent decrease in maintenance and eventual abandonment of the inter-district trail network in these regions during the 1930s. [Until the post-WWII era, however, planes could not provide the large-scale bulk of supplies and machinery needed, thus the small steamer, scows, launches, and sled roads remained the principal supply links into the area.] Thus, we witness transfer of available funds towards intra-district road improvements. Short wagon roads branching from Wiseman north to major diggings on Nolan and Hammond Rivers were built (or likely improved) in the mid- to late 1920s, confirming Brooks's (1924:72) belief that the life of smaller mining districts can be extended with the local building of wagon roads, which cheapens freight rates and potentially attracts larger-scale capital enterprises. Also in 1929, the first small caterpillar bulldozer was brought into Wiseman by supplier Sam Dubin. This single piece of technology would radically transform local transportation techniques in the years to come (Brown 1988:389-390), ultimately ending horse-scow and dog-sled freighting between Bettles and Wiseman, and between Wiseman and the major streams, as well as affecting local wood haulers and mine laborers.

Evaluation of Expectation #3, Placer Mining Settlement Hierarchy

Again, this expectation predicts that, depending upon population, topography, and degree of "frontier" development, a settlement hierarchy of up to five-tiers is expected in placer gold mining districts. These might include (from source to destination): (a) one or more Entrepots or major supply centers, depending upon geographical relationship to the core, (b) various Intermediate Transfer and/or Supply Points, (c) a Central Distribution Center, (d) various Secondary Distribution Points, and (e) numerous Extraction Camps. Minimally, the hierarchy needs at least one (or more) Entrepot, one Central Distribution Center, and Extraction Camps. This hierarchy should reflect the technological requirements of extracting and processing the resource, the existing transportation system, as well as supplying and maintaining the labor force in the placer district.

Table 5.11 describes the attributes expected for each of the five tiers in the transportation and settlement hierarchy, including spatial location, layout, relative size (i.e., both population and spatial), and functions, as reflected in number and type of services and businesses present.

Turning first to the question of an Entrepot, we find Seattle, Washington historically and continuously providing the primary link between Alaska and its "core," the United States. As Alaska is geographically non-contiguous with the rest of the U.S., we expect to find a single predominant Entrepot supplying Alaska's needs, as opposed to multiple supply centers as was found to be the case with the Colorado gold fields. In the case of Colorado, no single town or city had a clear advantage over any other, either in terms of geographic proximity or supply capability relative to mid-Western and Eastern manufacturing centers (Rohe 1985). Seattle, however, is the closest U.S. deep-harbor port to Alaska, and thus had a natural competitive edge over competitors, such as Portland and San Francisco. This geographical edge, along with a coordinated national campaign effort by the Seattle Chamber of Commerce, secured Seattle's Entrepot status to Alaska, during and after the Klondike gold rush of 1897-98, which effectively ended

Table 5.11 Placer gold mining settlement hierarchy.

A. ENTREPOT:

- one or more entrepots or major supply centers would be expected;
- located at or near the core-periphery boundary;
- funneling point for material supplies to, and extracted commodities from, the frontier and the core;
- would have the population, retail and wholesale outlets, financial channels, and transportation facilities necessary to perform this function;
- layout pattern would depend upon the original function of the site and/or the date of founding;

B. INTERMEDIATE TRANSFER AND/OR SUPPLY POINTS:

- a variable number of Intermediate Transfer and/or Supply Points located between the entrepot and the succeeding central distribution center are expected, depending upon the available means of transportation;
- such sites are located directly on a transportation route, either at transfer breaks in the supply route (i.e., Intermediate TRANSFER Points), and/or at more-or-less evenly spaced positions necessary to supply the means of transportation (i.e., Intermediate SUPPLY Points; e.g., pony express stations; railroad water and fuel depots; stage stations);
- functionally specific to the particular transportation route served, thus no extraction or processing facilities are present;
- variable layout pattern: if a transfer point, layout would be dictated by size of population as well as the nature and number of transfer routes present (e.g., along one route or at converging routes); if a transport-means supply station, would likely represent a one or a cluster of buildings along the route;
- if located at a transfer point in the supply route, warehouses and/or docking facilities would be necessary to temporarily store material goods en route in the transportation system.

C. CENTRAL DISTRIBUTION CENTER:

- a single "central place" should be located at a transfer point in the supply route, and immediately adjacent to or within the placer district;
- performing a function of "centrality" for the surrounding/adjacent mining district, the settlement should have a concentrated number of (specialized) retail, legal/judicial (courts; law enforcement; lawyers), monetary (i.e., banking), personal services (e.g., laundries, barbers), and social services (e.g., saloons; other entertainment; "secret societies") to serve not only the settlement's own population, but the surrounding hinterland as well;
- a gridiron layout plan is expected (either originally or eventually, depending upon date of founding);
- warehouses and/or docking facilities necessary to stock the surplus supply of goods aimed at the surrounding "hinterland" population.

D. SECONDARY DISTRIBUTION POINTS:

- one or more smaller "central" places located within the district at a transfer point in the supply route, and immediately adjacent to one or more producing placer creeks;
- such distribution points *within the district* are directly dependent upon the availability and nature of a transportation system AND the population density of the district;
- more prone to population fluctuations and even abandonment than the central distribution center, but less so than extraction camps;
- extraction or processing facilities may or may not be present, depending upon whether the site developed on a present or past mining claim (as was typical for such sites);
- linear settlement pattern expected along a transportation route, regardless of previous anticipated gridiron layout or date of founding.

(Table 5.11 continued)

E. EXTRACTION CAMPS:
• located at the end of the transportation system, directly at the location of resource collection on the creeks;
• may include one or more domestic units and/or other structures and equipment (e.g., shafts & pits, boilers, etc.) related to the actual extraction process;
• large-scale abandonment of heavy, bulky equipment is likely to occur at extraction locations, owing to the high cost of transfer/removal and the high rate of technology turnover and homogenization;
• clustered layout (if more than one building or structure) located immediately adjacent to extraction area;
• the most impermanent and numerous of the settlement types owing to the socio-political nature of "claims" appropriation and maintenance, the exhaustible nature of the resource, and the high turnover of population.

Seattle's economic depression (Berton 1958:110-145, 434). Of the numerous cities that benefited from the Klondike migration, Seattle would rake in the lion's share of the profits. By 1898, Seattle had secured $25 million, or 83%, of the entire U.S. and Canadian trade generated by the Klondike strike (Berton 1958:125). Of the ca. 100 thousand gold seekers that set out for the Klondike, most would pass through Seattle (Schwantes 1996:270). Seattle and Alaska would become inextricably entwined. Resulting largely from the Klondike boom, between 1898 and 1910 urban construction took off unabated, turning Seattle during this period into a cosmopolitan metropolis (Schwantes 1996:238-239). Seattle's population increased 88% between 1890 and 1900 (42,837 to 80,671), and another 194% (237,194) by ten years later (Seeman 1930: Table III, p.32). Figure 5.30 (see Table 5.12) illustrates the overwhelming percentage of Alaskan imports that passed through Seattle between 1902 and 1929 (as measured in dollars), figuring as high as 92%

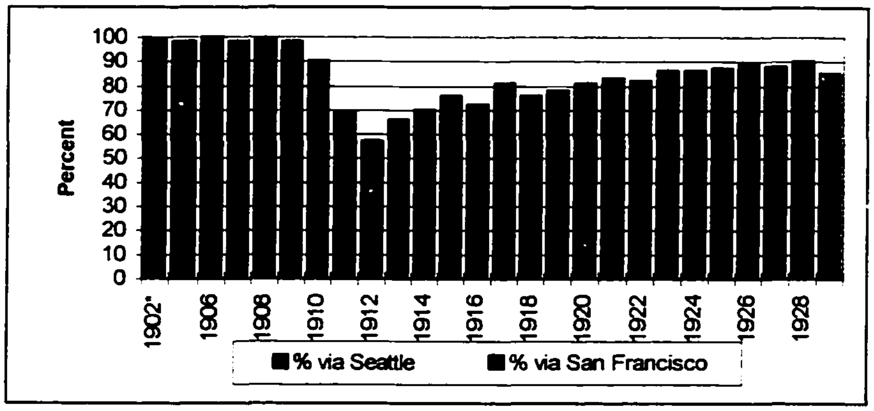


Figure 5.30 Percent of Alaskan imports from the United States deriving from Seattle and San Francisco, 1902-1929. San Francisco data only available for 1902-1910. Note Seattle's dominance in supplying Alaska with products.

Table 5.12 Total United States trade to Alaska, 1902-1929 (in dollars). See Figure 5.30. (Source: Rodman 1930, Tables V & VI).

	Alaskan Imports from U.S. ($)	% via Seattle	% via San Francisco**		Alaskan Imports from U.S. ($)	% via Seattle
*1902	3,223,000	88	11	1917	39,838,000	81
1905	13,990,000	84	14	1918	40,412,000	76
1906	16,818,000	92	8	1919	37,476,000	78
1907	16,928,000	88	10	1920	36,877,000	81
1908	15,249,000	84	15	1921	19,274,000	83
1909	17,090,000	81	17	1922	26,778,000	82
1910	16,823,000	71	19	1923	30,631,000	86
1911	14,694,000	69		1924	32,046,000	86
1912	21,323,000	57		1925	32,353,000	87
1913	21,097,000	66		1926	31,587,000	89
1914	21,100,000	70		1927	34,604,000	88
1915	22,847,000	76		1928	32,059,000	90
1916	30,171,000	72		1929	33,221,000	85

* 6 months only; 1902 earliest available data.

**San Francisco data only available for 1902-1910.

(1906) and at no time falling below 57% (1912). Likewise, Figure 5.31 (Table 5.13) illustrates that the majority of Alaskan exports to the U.S. passed through Seattle. This discussion serves to emphasize the key linkage that Seattle has served between Alaska and not only the U.S., but also the world at large.

As outlined in the hierarchy model (see Table 5.11), Seattle had a large enough population, retail and wholesale outlets, and financial and transportation facilities necessary to fulfill its role as Entrepot between the U.S. and Alaska. For example, by 1901 Seattle has at least 1563 general and other retail outlets, 107 wholesale merchants, 168 wholesale agents and brokers, 68 wholesale storage facilities, and 13 banks, and was serviced and supplied by seven railroad companies and at least 19 ocean transportation companies (R.L. Polk & Co. 1901). Figure 5.32 illustrates this data, comparing Seattle with the then-largest settlements in Alaska and the adjacent Yukon Territory in 1901 (i.e., Skagway, Juneau, Nome, Dawson), in terms of minimum quantities of available services

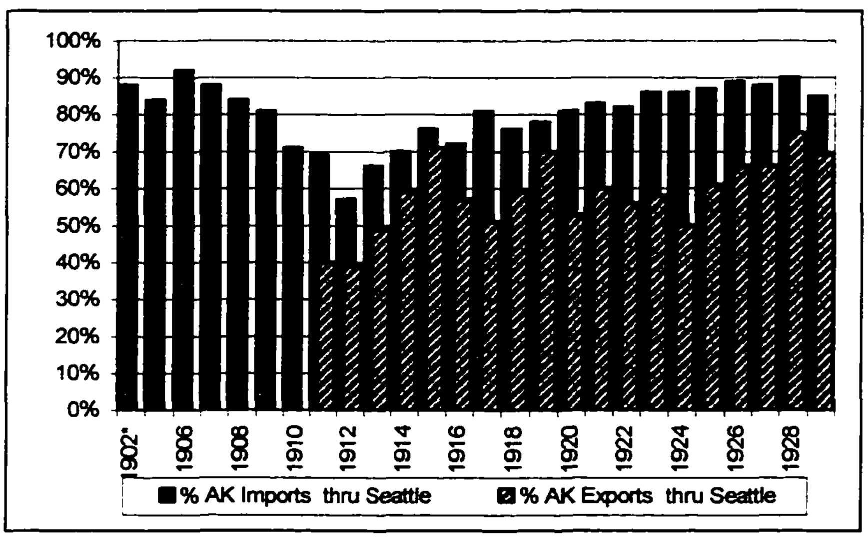


Figure 5.31 Percent of Alaskan imports and exports passing through Seattle (pre-1911 export data not available). As its entrepot, note Seattle's dominance in both supplying Alaska's imports and receiving Alaska's exports.

Table 5.13 Percent of Alaskan-United States imports and exports through Seattle, 1902-1929. See Figure 5.31. (Source: Rodman 1930: Tables V & IX).

	% AK Imports thru Seattle	% AK Exports thru Seattle		% AK Imports thru Seattle	% AK Exports thru Seattle
*1902	88		1917	81	51
1905	84		1918	76	59
1906	92		1919	78	70
1907	88		1920	81	53
1908	84		1921	83	60
1909	81		1922	82	56
1910	71		1923	86	58
1911	69	40	1924	86	50
1912	57	39	1925	87	61
1913	66	49	1926	89	66
1914	70	59	1927	88	66
1915	76	71	1928	90	75
1916	72	57	1929	85	69

and businesses (Ferguson 1901; R.L. Polk & Co. 1901, 1901-02). In addition, the difference in pure numbers of service and business outlets between Seattle/Entrepot and the "frontier's" largest settlements is clearly evident in this graph, as well as Figure 5.33 which compares 1901 Seattle with all then-present coastal Intermediate Transfer Points and Central Distribution Centers (i.e., Skagway, St. Michael, Valdez, Juneau, Nome), where goods were transferred from ocean-going vessels to either smaller river steamers or an overland means of transport (see Figure 5.1 for locations).

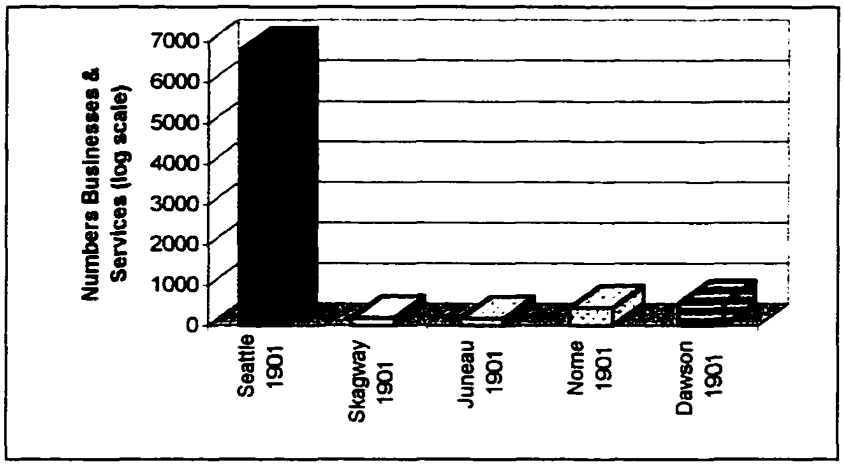


Figure 5.32 Numbers of services and businesses available in Seattle entrepot versus the largest Alaskan and Yukon Territory intermediate transfer points and central distribution centers, 1901.

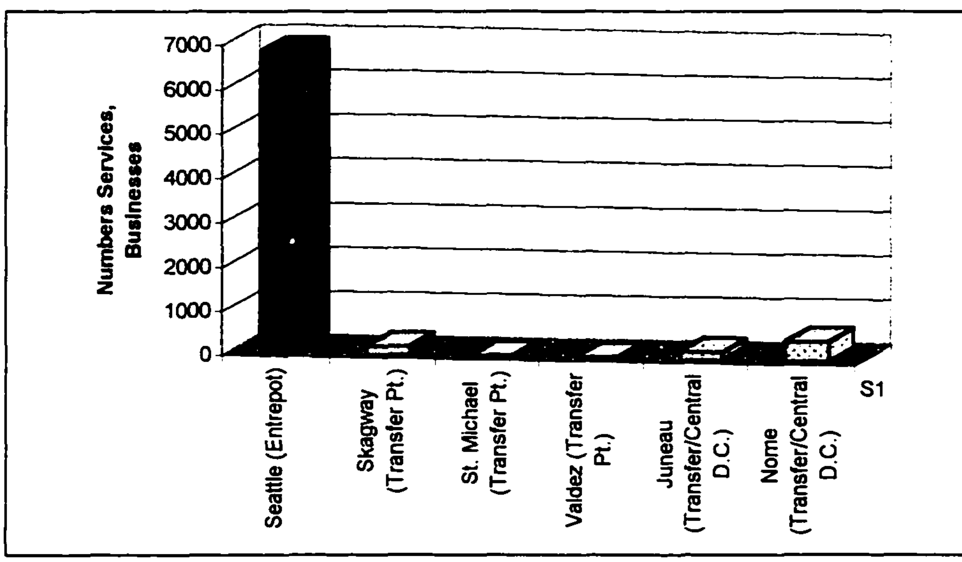


Figure 5.33 Numbers of services and businesses available in Seattle entrepot versus the largest Alaskan coastal intermediate transfer points, 1901.

It should be obvious that an individual settlement may fit into more than one of these categories, depending upon its geographical placement and potential relationship to more than one mining district. The Nome Mining District is a case example (cf., Schrader and Brooks 1900). Nome, founded originally in 1898 as "Anvil City," is located directly on the southern coast of the Seward Peninsula, and received material shipments directly from ocean steamers and sailing ships, via smaller skiffs and rafts, having no natural lightering harbor. For a brief few years, the Nome Mining District had a two-tier hierarchy, with Seattle being the Entrepot and Nome being both the coastal Intermediate Transfer Point and the Central Distribution Center for the adjacent beaches. Quickly, however, as gold was discovered further and further inland, smaller secondary distribution towns were founded, supplied by an expanding system of wagon roads and even small-gauge railroads. Further settlements were founded at the terminus of the railways and other roads, and within a few short years the Seward Peninsula developed a complete five-tier transportation and settlement hierarchy.

Turning specifically to the Koyukuk Mining district as the first case study (Figures 5.34-5.41)[1]. For these and similar figures below, the settlements are color-keyed: blue (Entrepot), yellow (transfer points), red (Central Distribution Centers), pink (both transfer and central), dark red (Secondary Distribution Point). The Koyukuk district's Figures 5.34-5.41 indicate an initial period of a four-tier transportation and settlement system, lasting from 1893 when the first semi-permanent trading post was built at Arctic City to ca. 1898[2], prior to the first gold stampede up this drainage. This

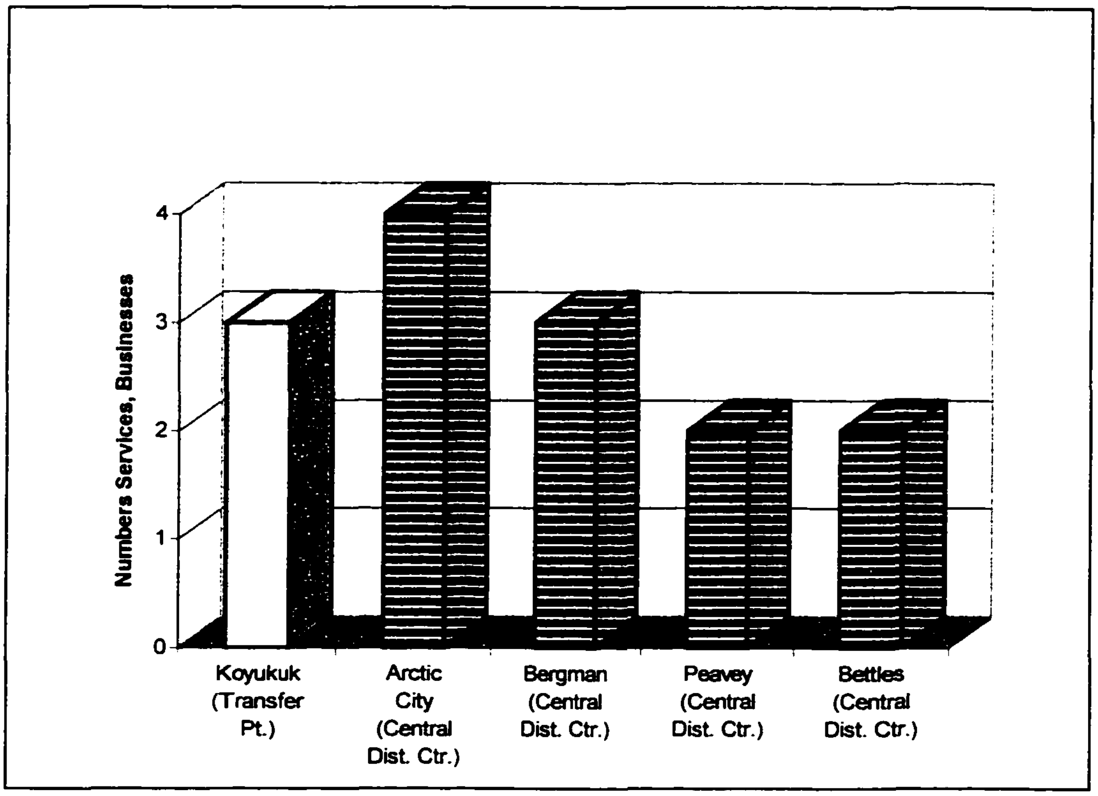


Figure 5.34 Koyukuk mining district transportation and settlement system, 1897-1898. Seattle entrepot and St. Michael intermediate transfer point data not available.

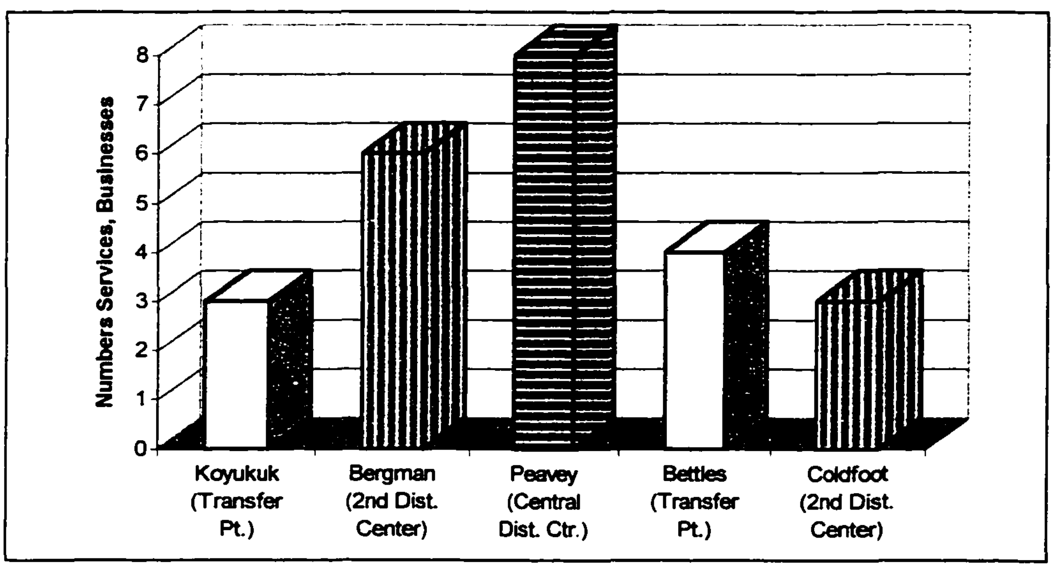


Figure 5.35 Koyukuk mining district transportation and settlement system, 1899-1900. Seattle entrepot and St. Michael intermediate transfer point data not available.

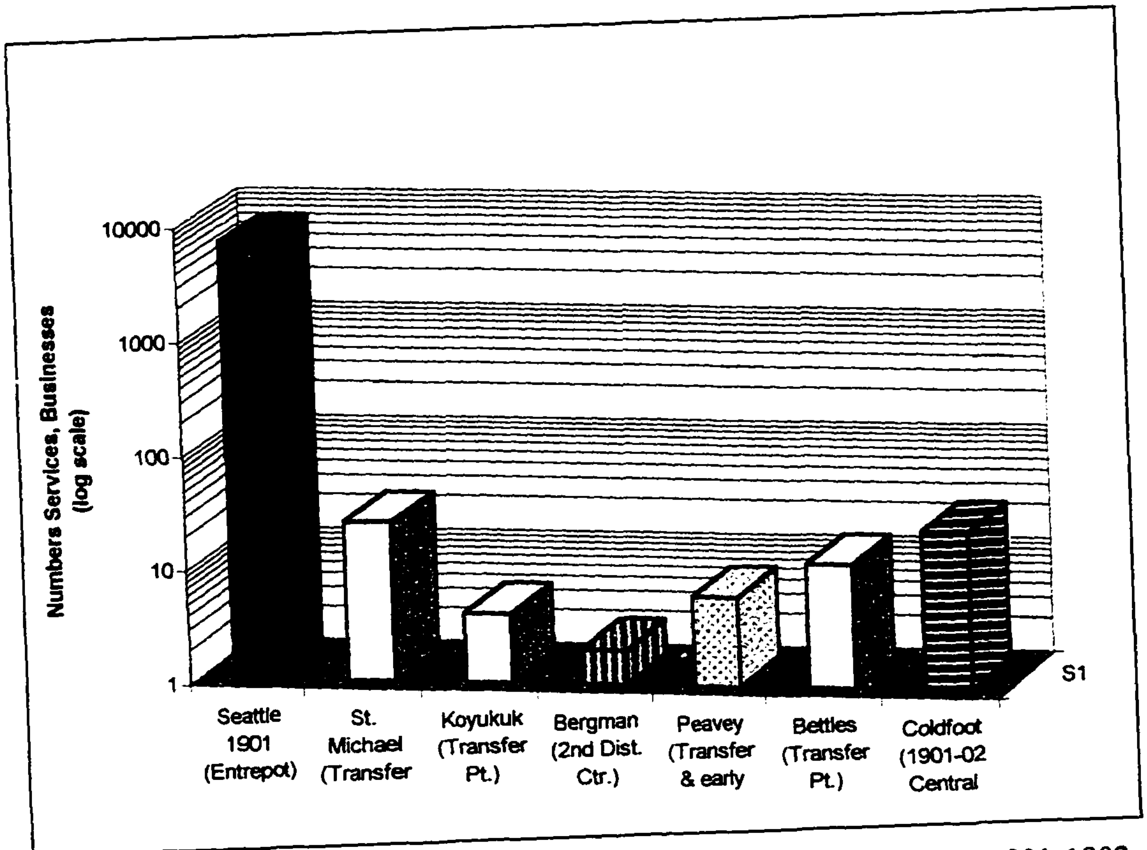


Figure 5.36 Koyukuk mining district transportation and settlement system, 1901-1902.

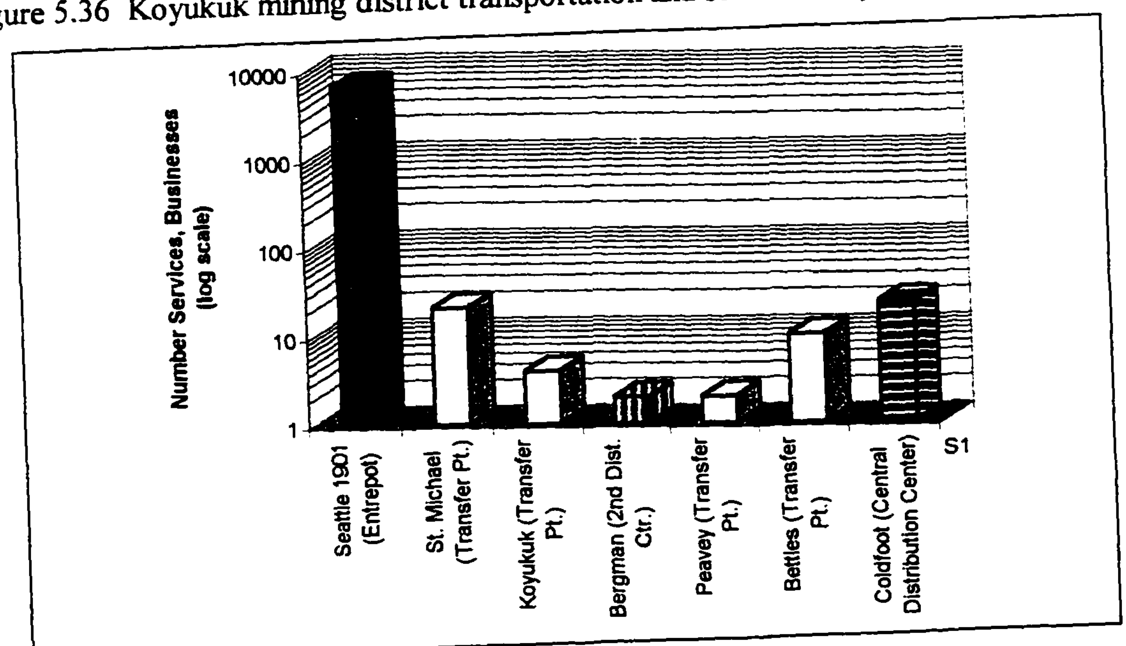


Figure 5.37 Koyukuk mining district transportation and settlement system, 1903-1904.

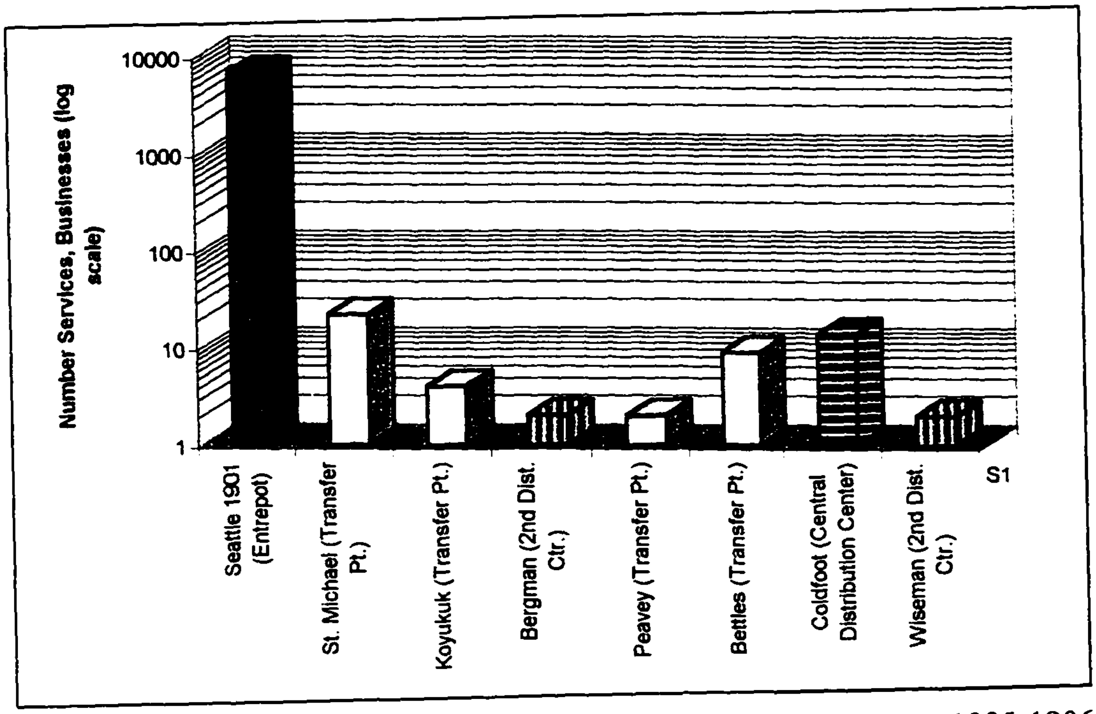


Figure 5.38 Koyukuk mining district transportation and settlement system. 1905-1906.

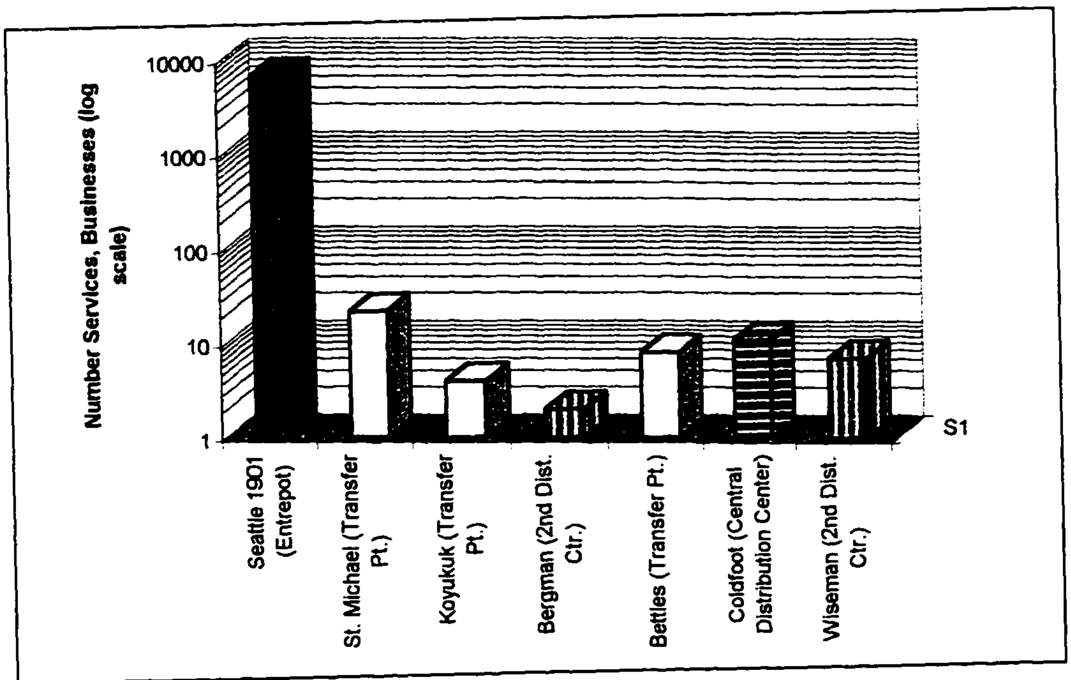


Figure 5.39 Koyukuk mining district transportation and settlement system. 1907-1908.

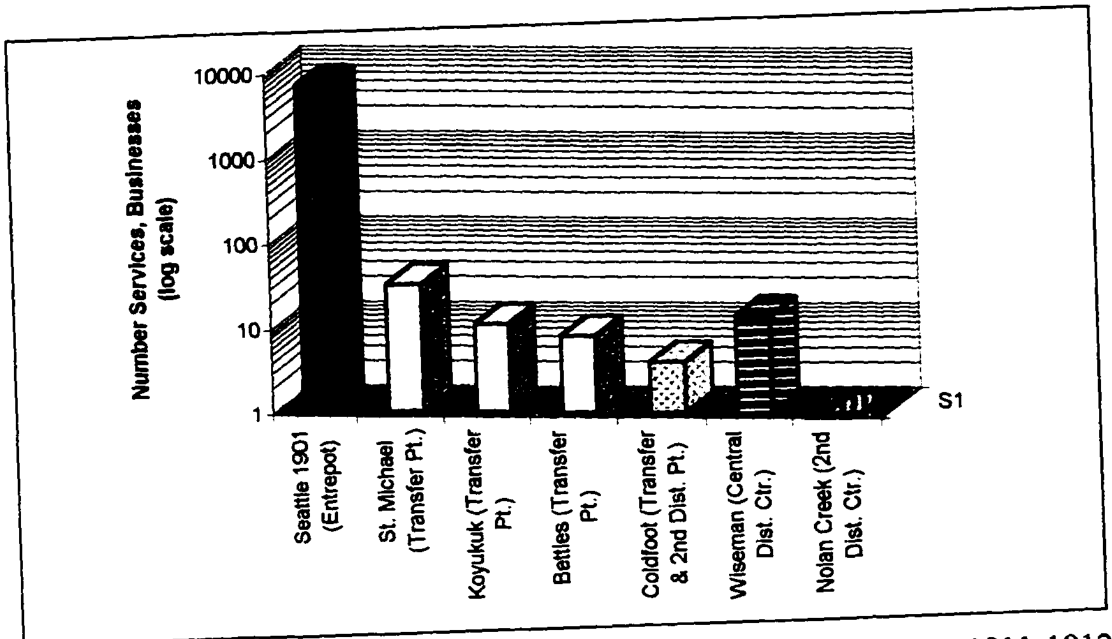


Figure 5.40 Koyukuk mining district transportation and settlement system, 1911-1912.

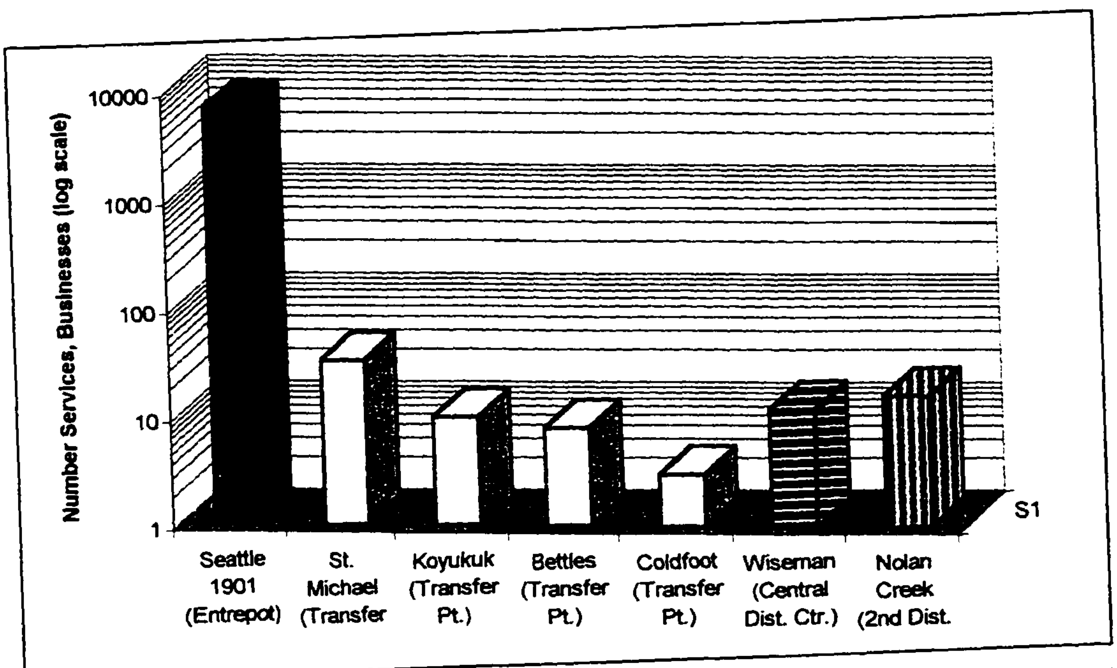


Figure 5.41 Koyukuk mining district transportation and settlement system, 1915-1916.

transportation and settlement system, as per the model presented in Table 5.11. included (1st) Seattle as the Entrepot, (2nd) St. Michael as an Intermediate Transfer Point (where goods were transferred from ocean vessels to smaller Yukon River steamers), (3rd) small Central Distribution Centers consisting of little more than supply posts at Arctic City (1893-96) and Bergman (founded spring/summer 1898), and (5th) primarily mid-Koyukuk river bars and benches as the actual extraction sites of gold (see also Figures 5.54-5.62, below). One is hard-pressed to call Arctic City and Bergman "central places," as there were no mining recorder offices (St. Michael was used during these early years), no U.S. Commissioners, and no Deputy Marshal's for law enforcement. The summer of 1898 saw a dramatic influx of miners "overflowing" from the Klondike, either coming upriver from St. Michael or down river from Dawson in the Yukon Territory. Thereafter, actual Central Distribution Centers were established first at Peavey, then at Coldfoot, and later at Wiseman (see Expectation #4 for details, below). The Upper Koyukuk would maintain a five-tier transportation and settlement system through at least 1916 (Figures 5.36-5.41).

Whereas documentary information from the Innoko district is sketchy, data from the adjacent Iditarod district indicate a five-tier transportation and settlement system immediately upon founding of the district after its principal 1909 stampede. Figures 5.42-5.43 illustrate the Iditarod district's transportation and settlement system in relational numbers of services, and Figures 5.65-5.69 illustrate the same data spatially, below. After St. Michael, small steamers ascended to Dikeman, located at the head of low-water small steamer navigation on the Iditarod River, where goods proceeded on to the Central Distribution Center (Iditarod), Secondary Distribution Points closer to the main diggings (Flat; Discovery), and lastly on to the claims.

The Fairbanks district also exhibits a five-tier transportation and settlement system throughout its history (Figures 5.44-5.47; see also Figures 5.70-5.74, below). Cole (1991:43) provides what is likely the earliest known map of the gold fields north of Fairbanks, dating to April 1903, shortly after the first payable quantities of gold were discovered during the summer 1902. This map, reproduced here as Figure 5.70, illustrates

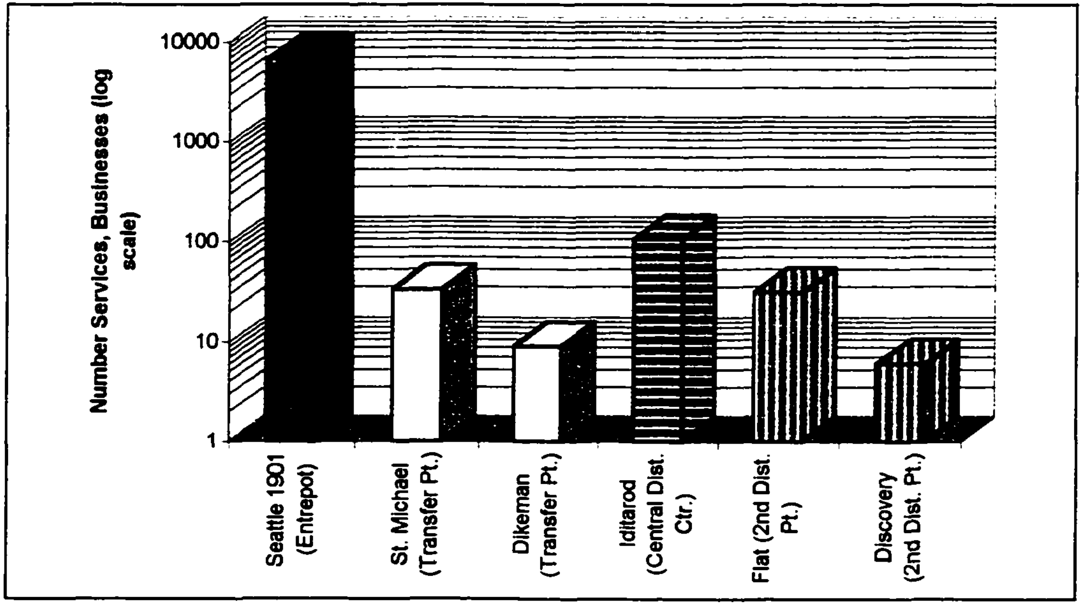


Figure 5.43 Iditarod mining district transportation and settlement system, 1915-1916.

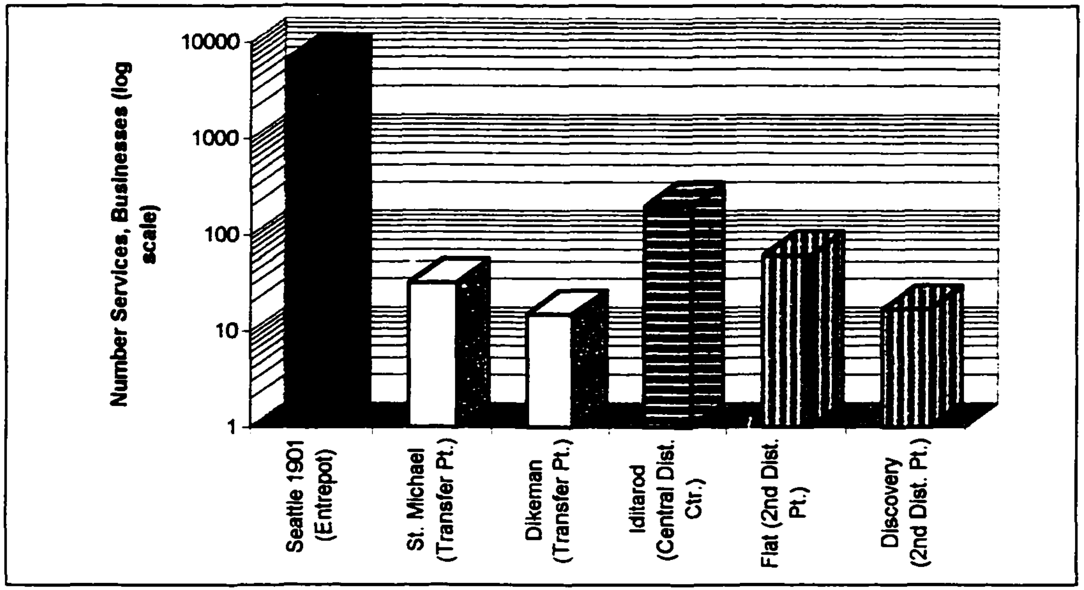


Figure 5.42 Iditarod mining district transportation and settlement system. 1911-1912.

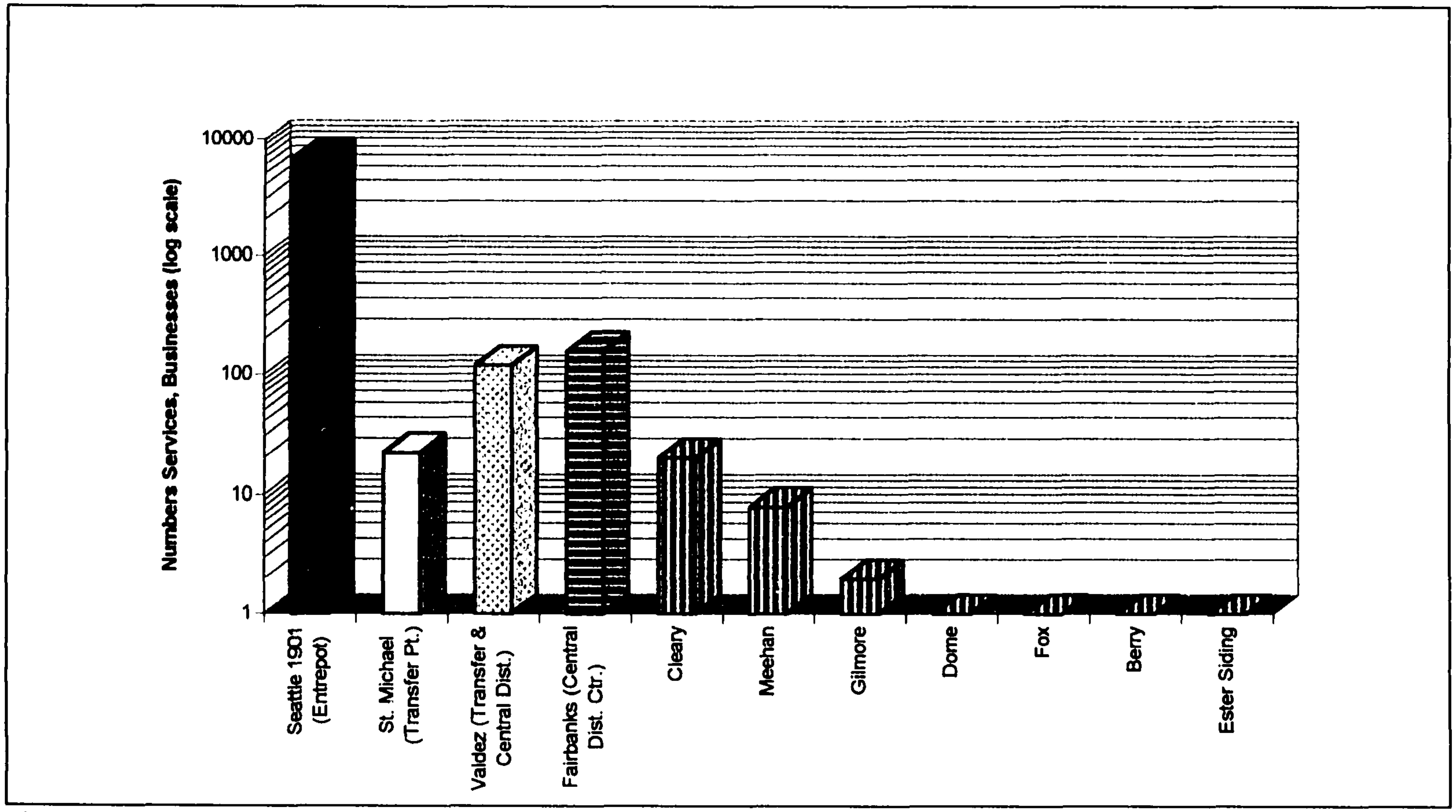


Figure 5.44 Fairbanks mining district transportation and settlement system, 1905-06.

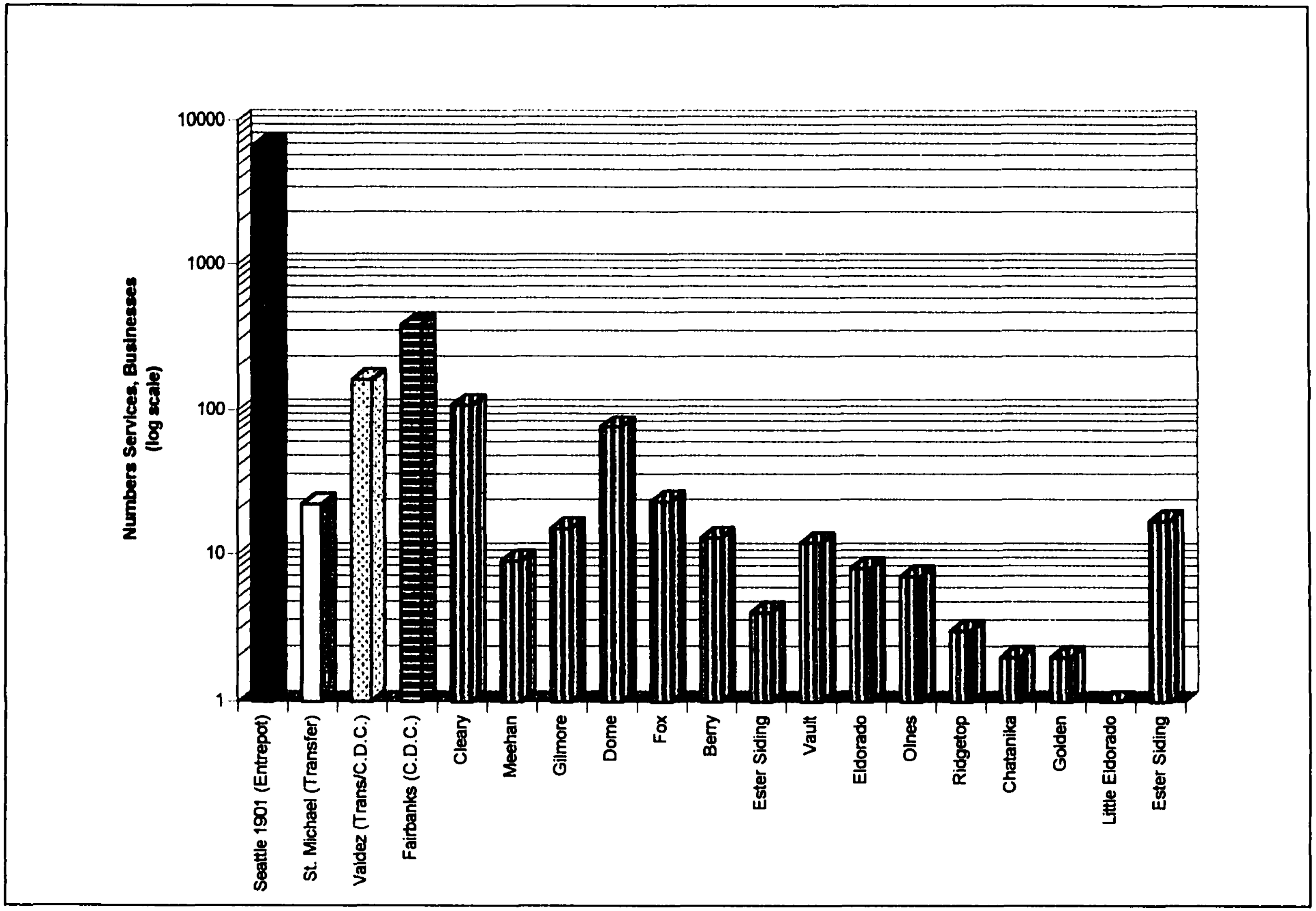


Figure 5.45 Fairbanks mining district transportation and settlement system, 1907-08.

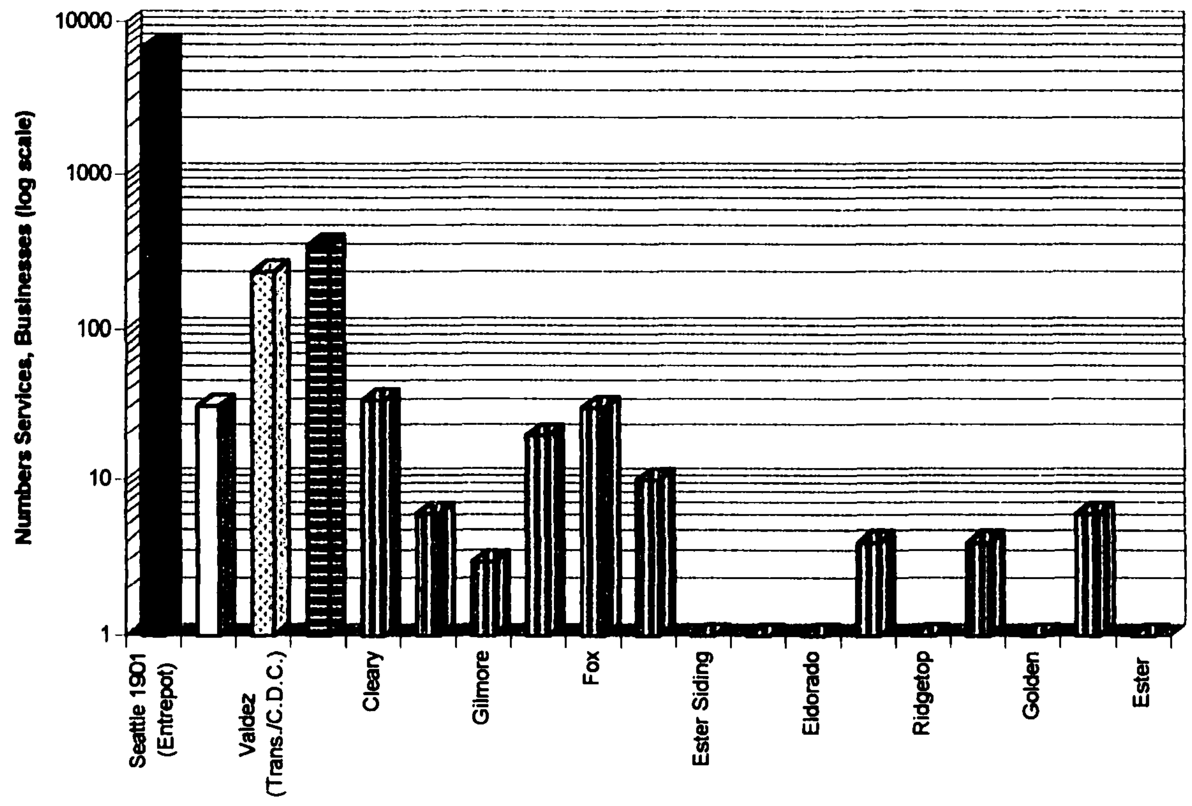


Figure 5.46 Fairbanks mining district transportation and settlement system, 19011-12.

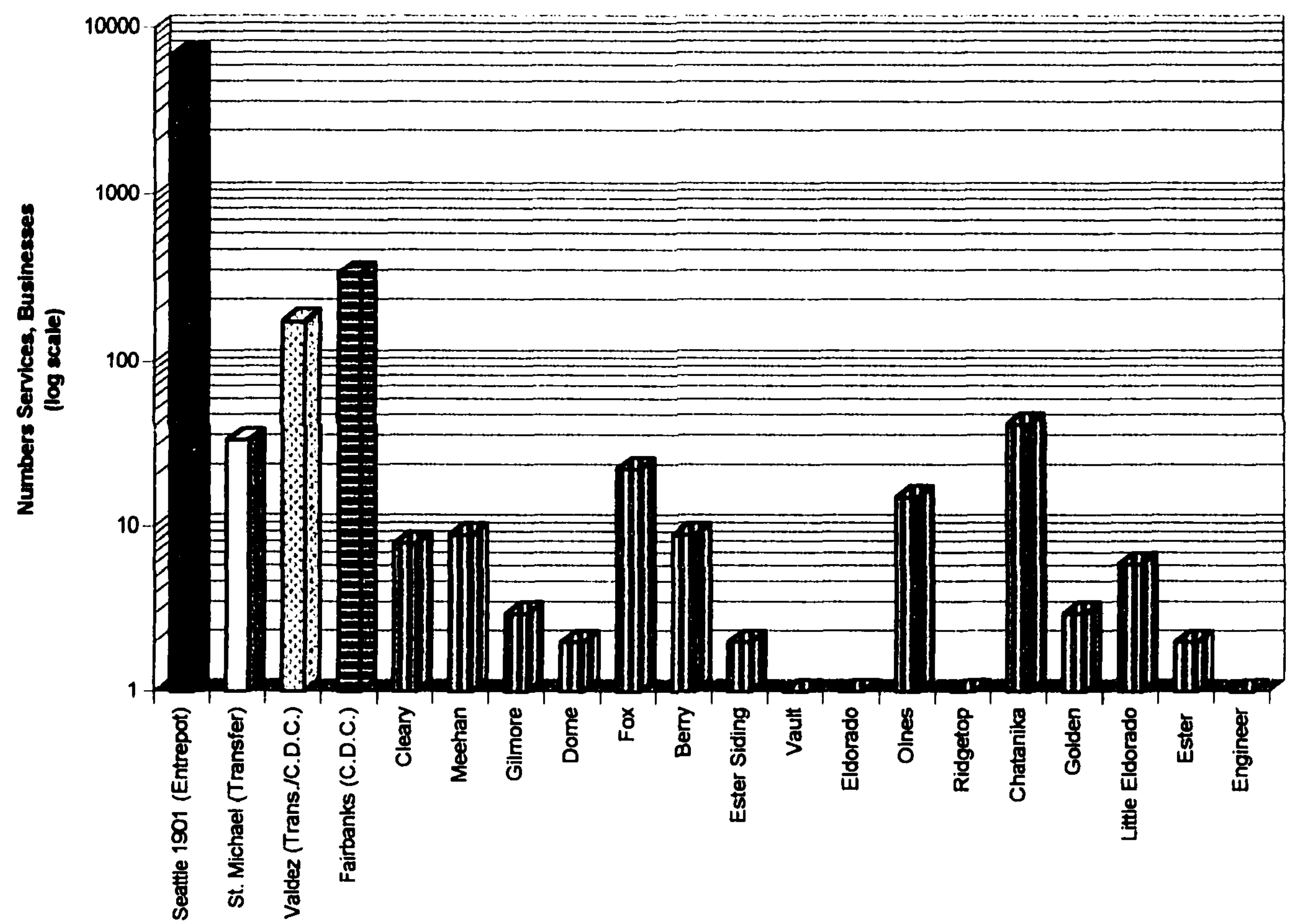


Figure 5.47 Fairbanks mining district transportation and settlement system, 1915-16.

the towns of Fairbanks, Chena, a WAMCATS U.S. Telegraph Station (not shown), and a summer trail system to the diggings. Four unlabeled blocks (distinct from the Fairbanks and Chena cross-hatched patterns on the original map) in the approximate locations of future Secondary Distribution Points Fox, Gilmore, Golden, and Cleary are also illustrated, possibly indicating the early establishment of some form of concentrated services among the diggings at this early time (spring 1903). After the transfer of goods from ocean to river transport at St. Michael, large and small steamers could ascend the Yukon, Tanana, and ultimately Chena rivers to Fairbanks, the Central Distribution Center of this district. While in times of exceptionally low water large steamers might not make completely up the Chena River to Fairbanks, the completion of a narrow-gauge private railway from the mouth of the Chena to Fairbanks, and northward out to the gold fields by fall 1905 (Deeley 1996), helped Fairbanks maintain its central status relative to its principal competitor Chena, as it was assured a constant uninterrupted supply of goods (see Figure 5.71, below). From Fairbanks, goods were transferred to various Secondary Distribution Points via a network of both rail and wagon roads, and from these ultimately to the adjacent or surrounding creeks. Valdez, in Prince William Sound on the Gulf of Alaska, was a secondary Intermediate Transfer Point into the interior, supplying limited goods and personnel to the Tanana Valley as early as 1903 by the WAMCATS trail, and likely earlier than that on popular though unsubsidized summer and winter trails. Even when a passable wagon road was completed all the way to Fairbanks by 1911 (Brooks 1905 to 1912), the Yukon steamer system through St. Michael continued to provide the majority of goods into interior Alaska until the completion of the Alaska Railroad (Seward-Fairbanks) in 1923 (Siddall 1955: Part III, pp.27-30).

One aspect of all of the transportation and settlement bar charts introduced above (Koyukuk: 5.34-5.41; Fairbanks: 5.44-5.47; Iditarod: 5.42-5.43), which compare relative quantities of services and businesses available between the various settlements, is their distinctive "U-shaped" curve. This “curve” has an upturn associated with the Entrepot/

major supply center, and a downturn at various primary and secondary transfer points. and then another upturn at the Central Distribution Center of each of the mining districts. This of course is expected, with upturns associated with concentrations of economic, political, social, and even religious services and businesses in the Entrepot and the Central Distribution Center. and downturns associated with specialized transportation localities. Any subsequent Secondary Distribution settlements in the mining district beyond the Central Distribution Center will have decreasing quantities of such services or businesses, depending upon the surrounding population of its creeks at any particular point in time.

Apart from the Entrepot (discussed above), placer gold mining "central places" inside Alaska should have both greater numbers of services and businesses relative to associated secondary distribution settlements, as presented in Figures 5.34-5.41 for the Koyukuk, Figures 5.44-5.47 for Fairbanks, and Figures 5.43-5.44 for the Iditarod district, as well as a greater variety of such services and businesses. While Siddall (1955:Part I; see also Utermohle 1967) discusses the "centrality" of Alaskan gold settlements at mid-century in terms of airline travel and per capital retail sales figures (1955:Part I, pp. 9-12), such data are either not applicable or are not available for the study regions for the early decades of the twentieth century. Instead, I turn to numbers and types of economic. social, political, and religious services provided by different settlements. Figure 5.48 illustrates Fairbanks (furthest left; labeled Central Distribution Center) and a variety of Secondary Distribution Points located among the gold creeks north of Fairbanks, in 1907-08. The figure illustrates the numbers of different types of services and businesses present at each locale, as represented by numbers of different colors. Thus, Fairbanks on the left has more colors/services than any other secondary site, though Cleary (immediately to the right of Fairbanks and at its peak population) is a close second. All other Fairbanks time periods discussed above (1905-06, 1911-12, and 1915-16) indicate this same pattern. Likewise, Iditarod in the Iditarod district (Figure 5.49) and, sequentially, Peavey, Coldfoot, and Wiseman in the Koyukuk district (Figure 5.50; see Figure 4.49 for service codes) illustrate this same pattern: more colors/services and businesses in the recognized

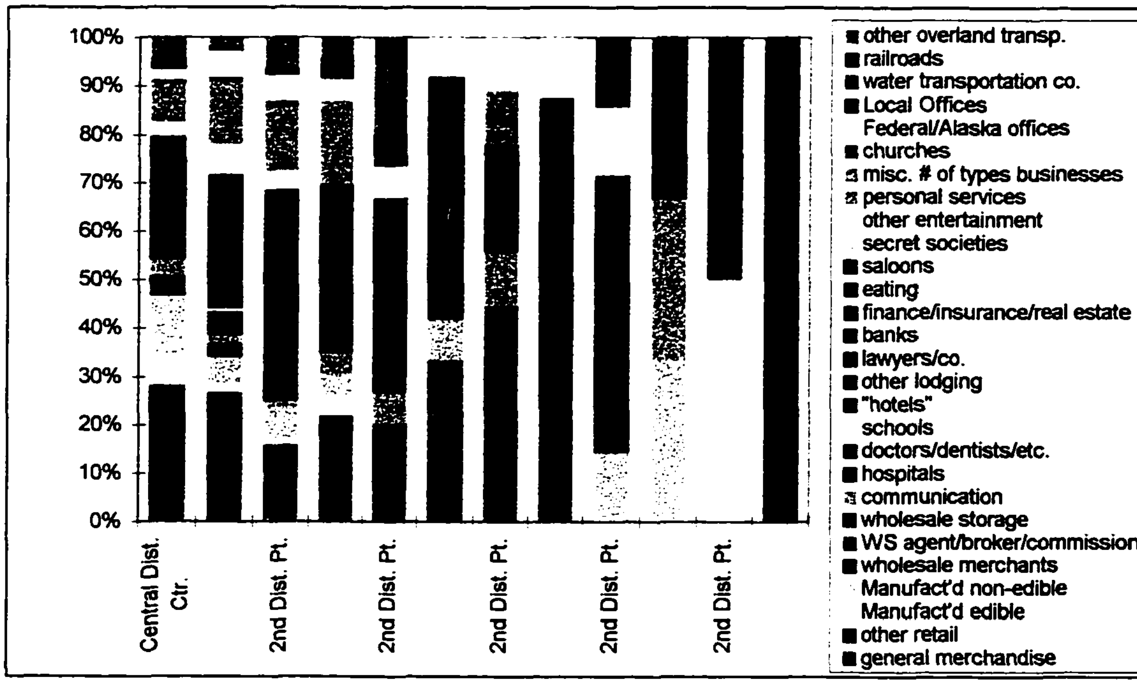


Figure 5.48 Numbers of types of businesses, Fairbanks (central) and secondary distribution towns in Fairbanks mining district, 1907-08. Note more variety in Fairbanks.

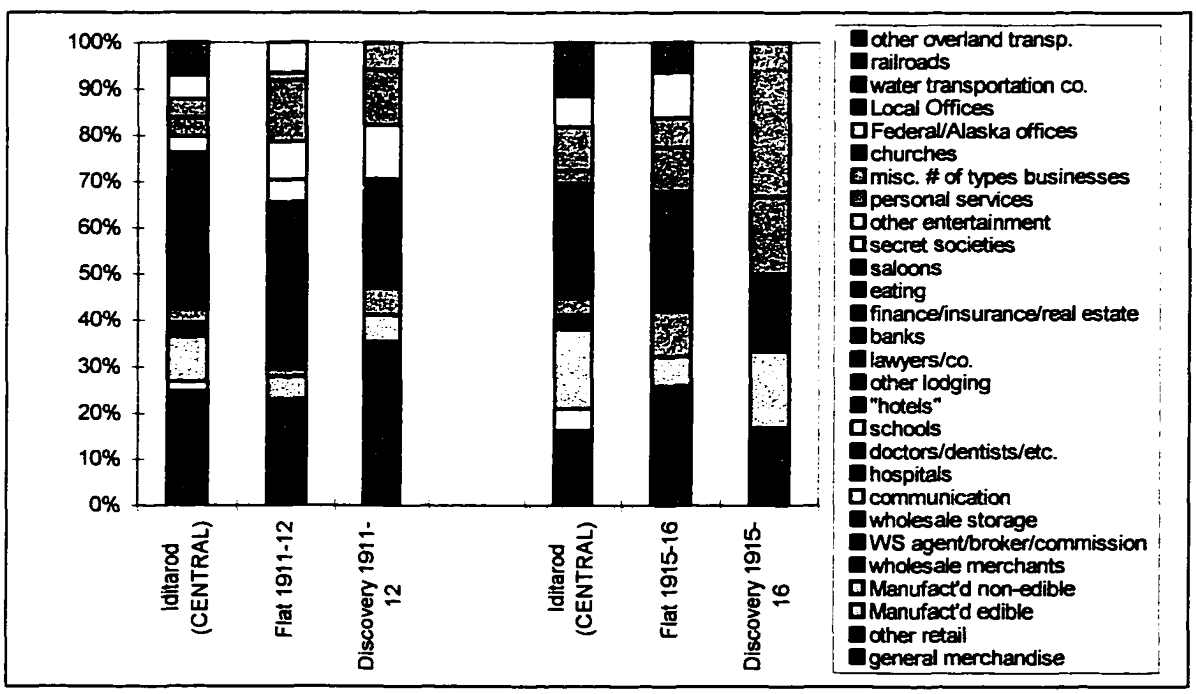


Figure 5.49 Numbers of types of businesses, Iditarod (central) and secondary distribution towns in Iditarod mining district, 1911-16. Note more variety in Iditarod.

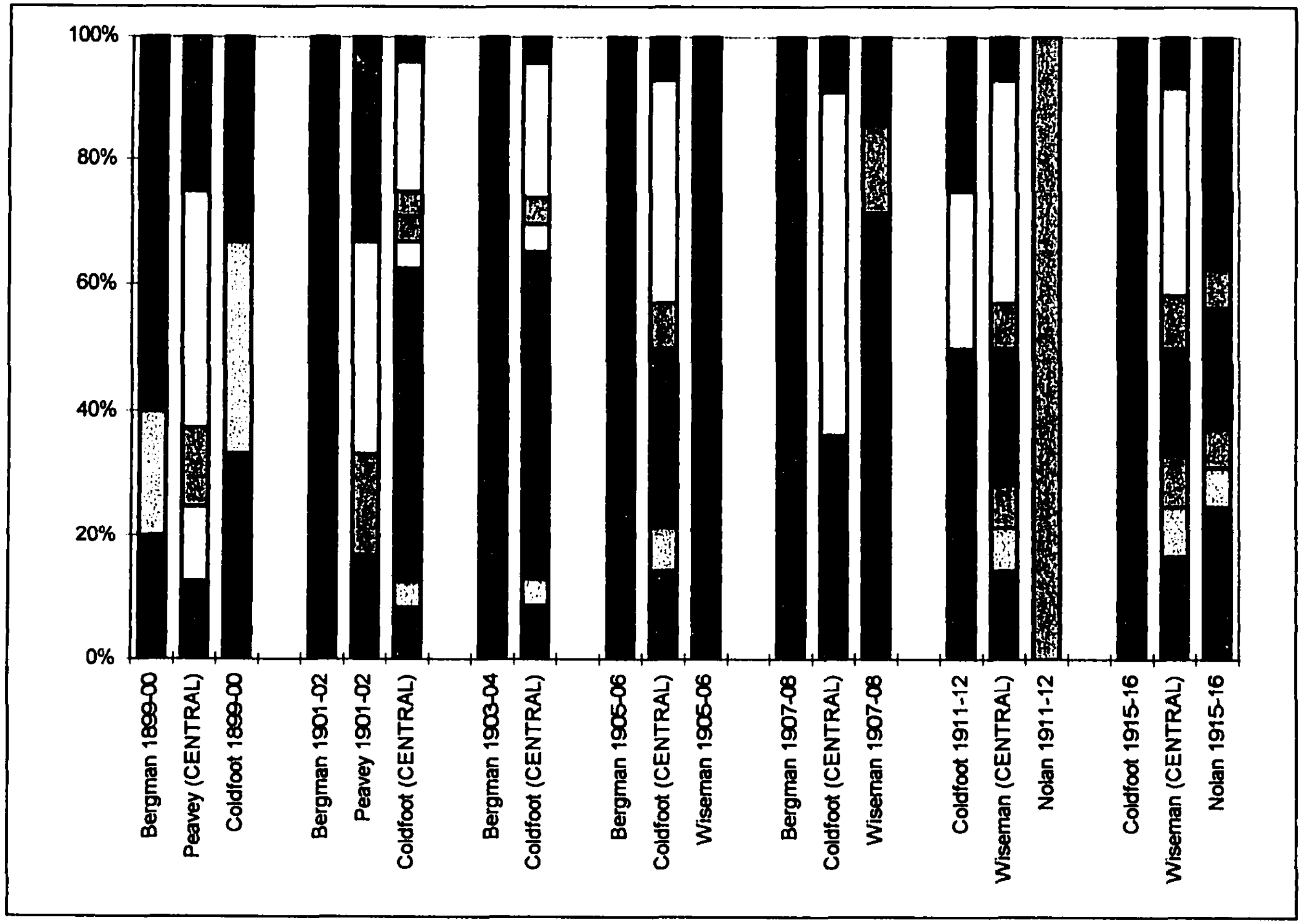


Figure 5.50 Numbers of types of businesses in the Koyukuk mining districts changing central distribution centers and secondary distribution towns through, 1915-16. Note consistently more variety in the central distribution centers through time. Note same number of type of services in 1907-08 (Coldfoot:Wiseman) and 1915-16 (Wiseman:Nolan). In both cases, however, the central towns retained all federal appointments in the district. See text for details.

Central Distribution Centers. A sole exception might be found with the relationship between Wiseman and Nolan, 1915-16. According to Figure 5.41, Nolan appears to have more services than Wiseman in 1915-16, the acknowledged central settlement in the Upper Koyukuk. This is owing to a relatively large number of freighters (N=6) listed as operating out of Nolan (R.L. Polk 1915-16:393-394). Likewise, the number of types of services available in Wiseman and Nolan at this same time is the same, as are the number of types of services in Coldfoot and Wiseman in 1907-08 (Figure 5.50). However, as the federal posts of U.S. Deputy Marshal and U.S. Commissioner were located in Coldfoot (1907-08) and Wiseman (1915-16) at these times, we shall retain their central place designations at this time (see Expectation #4 for the importance of these federal posts at Alaskan mining central places).

Besides their increased number and diversity of provided services and businesses, another attribute of central places portrayed in the model (Table 5.11) are their geographical placement at a break in transfer of goods. Taking the Koyukuk district first, each of the successive Central Distribution Points (Peavey, Coldfoot, Wiseman) was located at such a break in transport. Owing to the variable nature of water level on the Koyukuk, small steamers likely could make it to Peavey, possibly to Bettles, but typically somewhere in between (e.g., Camden 1904:241-242). Thus, during the first few years post-1899, Peavey and Bettles formed a boundary of sorts, depending upon the nature of the water level. In 1902, the Northern Commercial Co. constructed a specially-designed shallow draft small steamer, amply named the S.S. Koyukuk, to ascend the river to Bettles (Pope n.d.:Photo #66-15-620; Northern Navigation Co. 1912). While the Koyukuk and other shallow-draft steamers would service Bettles regularly for the next few decades, ascent all the way to Bettles could never be totally assured, and many caches of supplies and passengers continued to be off loaded below Bettles, and transported the rest of the way with small gasoline launches or pole boats (e.g., Murie 1978:113-119). Coldfoot is located at the mouth of Slate Creek, on which Myrtle Creek itself was a tributary and the site of the original discovery of payable placer gold in the Upper Koyukuk. Most goods were transferred to Coldfoot via expensive horse-drawn scows or pole boats, though winter dogs sleds also brought in goods, and from there by pack or dog team to the creeks. Wiseman, only 15 miles further up the Middle Fork, also was located at its confluence with Wiseman Creek, where goods then were transferred to the creeks via overland means of transport.

The founding of Fairbanks has been outlined by Cole (1991), who presents the sequence of events that fortuitously placed E.T. Barnette's trading post immediately adjacent to some of the richest placer gold fields in Alaska in the Fall of 1901. Barnette founded his post at the future town site of Fairbanks not by choice, but by accident: the small steamboat he was traveling on could not ascend much further up the Chena River, thus he could not make it the additional 200 miles to Tanana Crossing, where he originally had hoped to bring his supplies and found a trading post (Cole 1991:16-24). He was effectively stranded at the head of steamer navigation on the Chena.

As luck would have it, gold was discovered north of his post the following summer, and the town of Fairbanks quickly grew up around his post. The rival town of Chena, located just downstream of the confluence of the Chena River and the Tanana, too was located at a seeming break in transport. Whereas steamers might be able to ascend up the Chena to Fairbanks, they would always be able to get to Chena at its mouth. Both towns competed to become the principal Central Distribution Center for the new diggings, and in 1904-05 Chena was almost as large as Fairbanks. Two events gave Fairbanks the edge: Judge Wickersham's political decision to move the new Division Court to Fairbanks in 1903, and the construction of the narrow-gauge Tanana Mines Railway from Chena to Fairbanks and on to Gilmore (see Figure 5.71, below) in 1905. This railway, ironically headquartered in Chena, would essentially solve Fairbanks's sometimes low-water problem by effectively guaranteeing that supplies could make it to Fairbanks, regardless of water level on the Chena. Chena town site steadily declined in the years to come, and was being dismantled for its building material by 1916, and largely abandoned in 1920 when the railroad tracks leading to it were taken up (Cole 1991:58-59, 82-87).

The Innoko and Iditarod districts repeat this same pattern (see Figures 5.65-5.69. below). Dishkakat, the principal transfer point on the Innoko River leading to the upper Innoko diggings was located effectively at the head of low-water navigation, where goods from small steamers transferred to smaller water craft. While small steamers might descend further, even much further during times of high water, they could at least get to Dishkakat. Ophir, the Innoko district's Central Distribution Center since 1908, was also located at the mouth of Ophir Creek, a tributary of the upper Innoko River, at a transfer point from primarily water-borne transport to overland transport (Brooks 1909). Likewise, Dikeman, the principal transfer point from steamers to smaller water craft, was the head of low-water navigation on the Iditarod River. During times of high water, steamers might get to Iditarod and possibly even to the mouth of Otter Creek (the principal placer gold drainage), but later in the season as water level lowered Dikeman was the acknowledged head of steamer transport. Iditarod itself was founded in 1910 at the furthest point upstream that steamers carrying stampeders from Fairbanks could ascend up the Iditarod River. An early transfer point called Otter was located at the mouth of Otter Creek, and the Secondary Distribution Points of Flat, Discovery, and early-on Bowlder were all located at the mouths of smaller placer-bearing tributaries (Brooks 1911-1913; R.L. Polk 1911-12).

Lastly, corroboration of the fifth-tier in the transportation and settlement system, that of small-scale or solitary Extraction Camps located directly on the gold creeks, is accomplished through available cultural resource management survey reports (e.g., Sattler et al. 1994; Saleeby n.d.; National Park Service 1997). Extraction Camps (see Table 5.11) are expected to consist of domestic structures, associated domestic trash, and various technological features, artifacts, and land-use patterns reflective of the placer mining economy. In one select survey area north of Fairbanks, Sattler et al. (1994) amply demonstrate the abundance of such miners's cabins and camps, domestic and industrial refuse sheets and dumps, mining artifacts and features (e.g., boilers, shafts, pipes, water ditches, penstocks, tallus piles, hoses, etc.) found scattered along the placer streams immediately adjacent to the area of gold extraction (e.g., Figures 5.51-5.52). Likewise. select creeks surveyed in the 1980s and 1990s in the Upper Koyukuk (Saleeby n.d.) not surprisingly demonstrate the same domestic and mining-related features and refuse spread out along placer gold creeks. Such data are abundant in Alaska wherever there has been placer mining, and is found whenever systematic archaeological reconnaissance and survey has taken place (e.g., Figure 5.53; see also Smith 1997).

The question of Intermediate Transfer Points functions, services, and layout will be taken up separately, below, as part of the Transportation frontier.

Evaluation Of Expectation #4, Changes In Settlement Hierarchy

Again, this expectation predicts that economic, political, and social functions of individual settlements will shift through time, often relatively rapidly, resulting even in site abandonment. This results from a variety of reasons, including (but not limited to) resource depletion and changes in technology and transportation routes at various times and places within a district. Similarly, types or quantities of services typical of a higher settlement level (or tier) shift down (or up) a tier in direct relation to an increase (or decrease) in population. This is a simple mechanism of supply and demand. Relative to a placer mining settlement system, we hypothesize that the richer and/or more extensive the "paystreak" is, the more miners will be supported, thus the more services will develop to supply and service the miners closer and closer to the actual mines.

The recognized "central place" of any Alaskan placer mining district was the settlement containing the greatest, or only, number of federally appointed officials. Minimally, an active district required a U.S. Deputy Marshal (for law enforcement) and a U.S. Commissioner, who in the smaller districts would also double as the mining claims recorder, probate judge, coroner, and justice of the peace (Brown 1988:226-227; Schrader 1904). These positions would move as populations and businesses shifted from locale to locale, or would be initially established in the largest settlement of a new district,

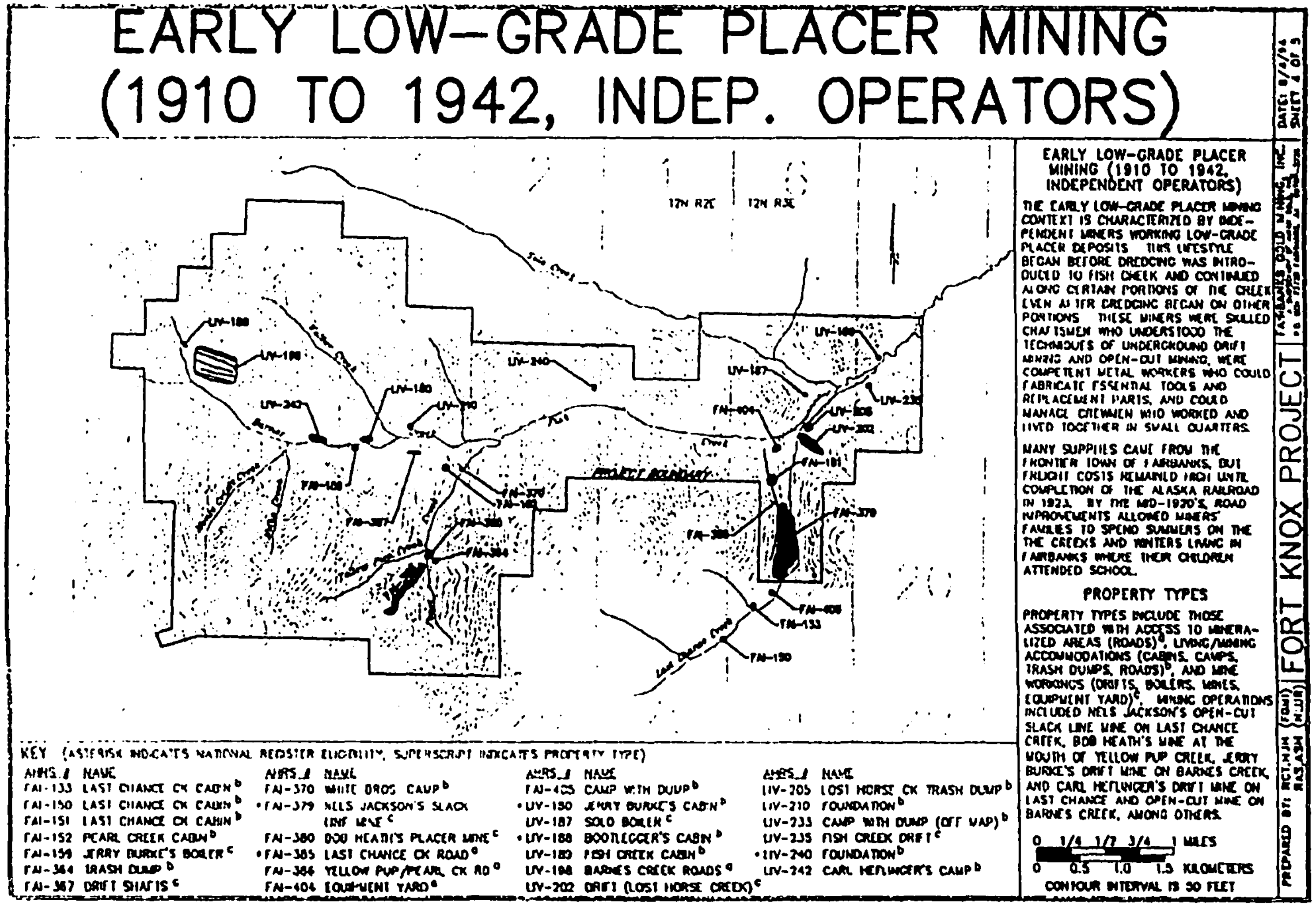


Figure 5.51 Early low-grade placer mining features encountered during archaeological reconnaissance of placer gold creeks north of Fairbanks. (Source: Sattler et al. 1994: Figure 5.5).

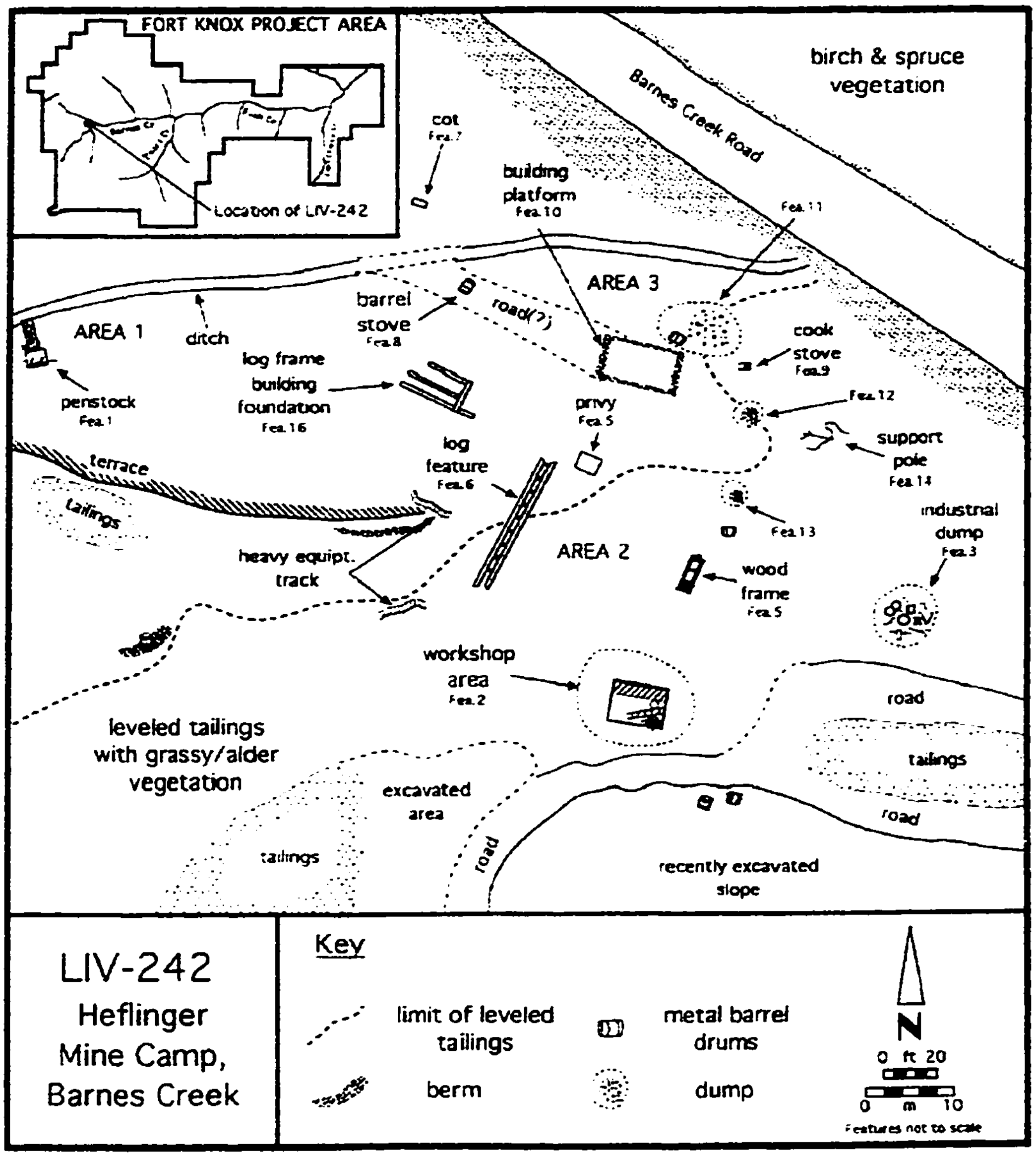


Figure 5.52. Plan view of Heflinger's mine camp (LIV-242), illustrating the abundance of refuse associated with a placer mining domestic structure. (Source: Sattler et al. 1994: Figure 5.34).

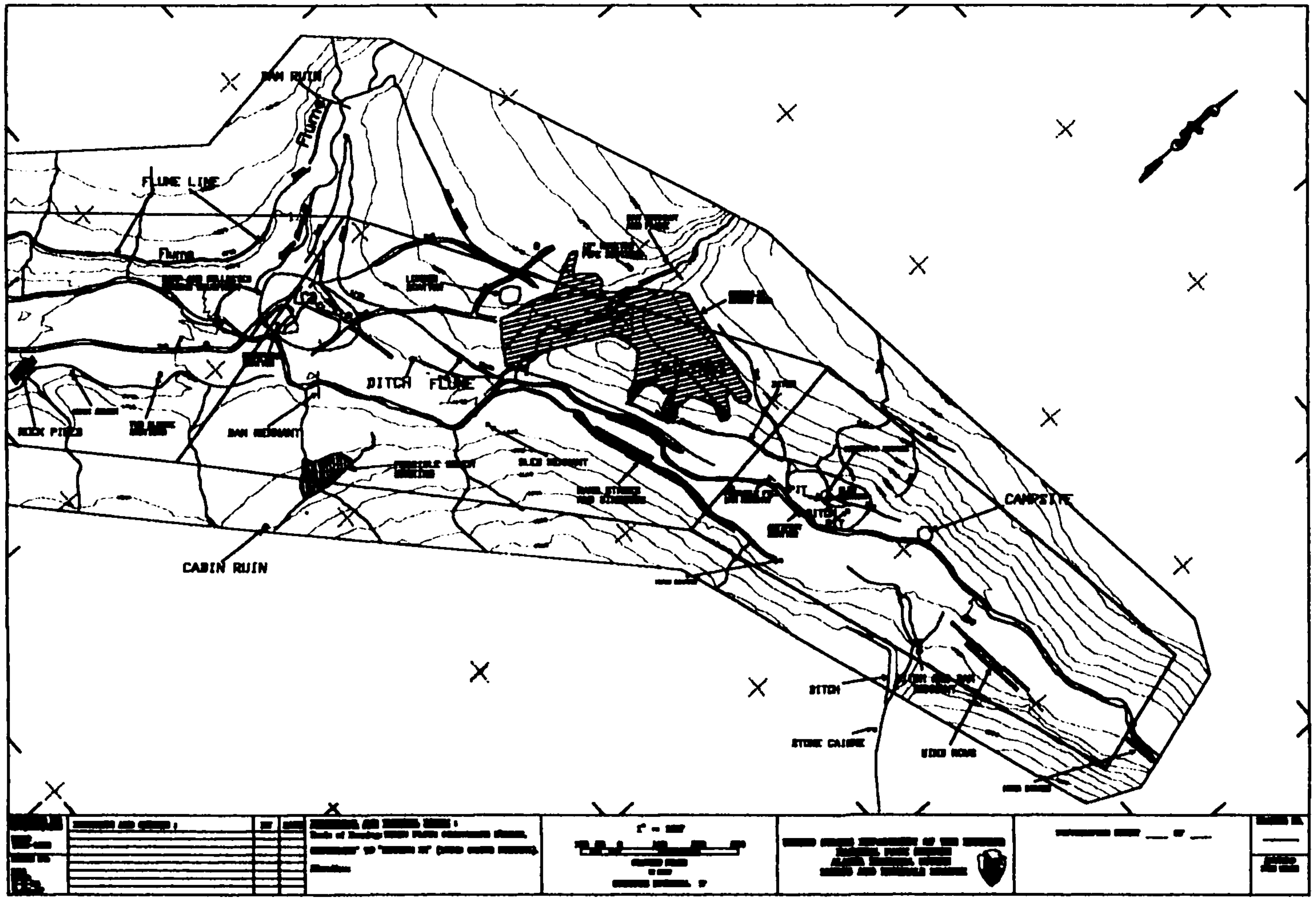


Figure 5.53 Mining-related artifactual refuse and features located on a placer gold creek, south-central Alaska. (Source: National Park Service 1997).

and serve as a proxy measure of centrality for placer mining districts, especially smaller ones. The exact number and placement of these federal positions depended in practice upon the population size of the district and number of towns. Small districts might have only two men to fulfill both positions (e.g., the Koyukuk district never had more than two men occupying these positions, one Deputy Marshal and one Commissioner), whereas other districts were more elaborate, such as the Fairbanks district (discussed further below). I will use these federally appointed positions to help us view shifting centrality across the landscape. Post office establishments and closings can be viewed in a similar way, though there seems to be no fixed minimal population number for their continuance in a town, which is highly variable and based in part upon other available populations centers to which mail service could be diverted to if needed.

As described earlier, high population mobility is a characteristic of placer mining regions and districts. As the prospecting and mining population shifted across the landscape through time, often quite rapidly, the merchants and other service-oriented population would shift with them, leaving behind depopulated and often totally abandoned settlements. The Koyukuk district is a perfect case in point. Prospectors had been working in the lower and middle regions of the Koyukuk drainage since at least the mid-to-late 1880s, resulting in the first trading post built on the river in 1892 by Capt. William Moore and Gordon C. Bettles, and which McFadyen Clark (1996:25) places in the vicinity of the Hogatza and Indian Rivers (Moore 1923, in Brown 1988:149; Bettles 1995; Alaska Jesuit Mission Records n.d.). This was followed the following spring 1893 by a newer post at (Old) Arctic City, located 5 miles above the mouth of the Kanuti River and a few miles below Hughes Bar, where small quantities of gold were being removed (Figure 5.54). Bettles's reasons for moving the post were simply economical and based upon notions of centrality: "The idea of making this trip up the Koyukuk [i.e., establishing Arctic City in 1893] was to have supplies nearer the source of gold, as most of the prospector's time was spent moving his supplies up as far as the bars, and they were fairly well worked out" (Bettles 1995:16). The better bars along the Koyukuk that Bettles

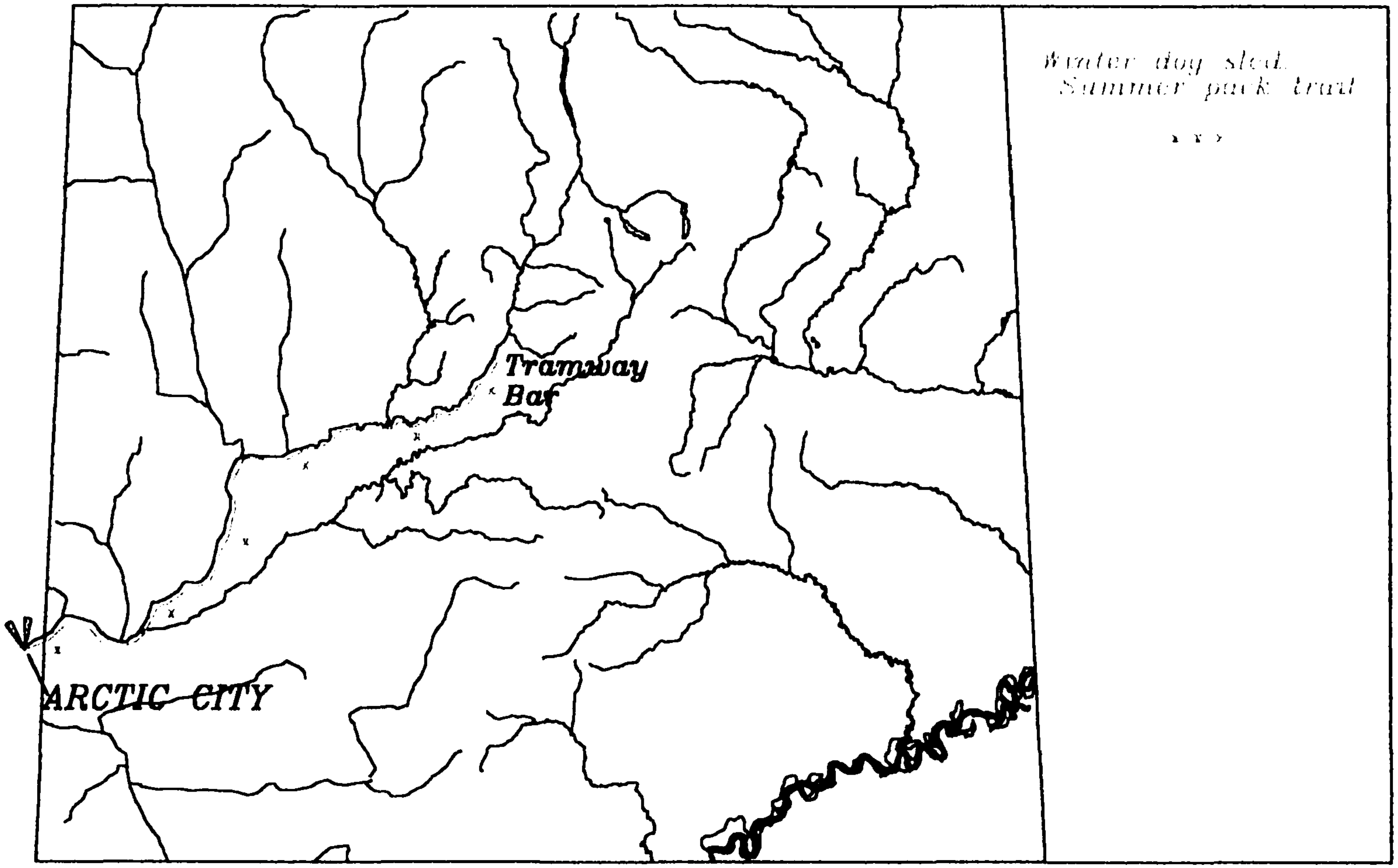


Figure 5.54 Transportation and settlement system, Koyukuk district (1893–95). Note only one trading post on the Koyukuk River en route to the main diggings at Tramway Bar.

refers to were Hughes Bar and Florence Bar located further down river. (Old) Arctic City was supplied by Moore and Bettles's small 35-foot open hold steamer *Cora*, which was later rebuilt by adding 30 more feet and re-named the *Koyukuk* during the winter of 1893-94 (Bettles 1995:16; Moore 1923 in Brown 1988:150). Gold was discovered in the summer 1893, ca. 150 miles further up the Middle Fork of the Koyukuk at Tramway Bar. The number of prospectors and miners in the Koyukuk drainage during this early period was small, never appears more than a about two dozen (Alaska Jesuit Mission Records n.d.; Brown 1988:152). Arctic City would thus remain the lone trading post on the river through 1895, but was closed by January 1, 1896 with the discovery of gold near Rampart further up the Yukon river enticing away the Koyukuk prospectors. Gordon Bettles built another centrally placed trading post named Bergman a few miles further up the Koyukuk in 1898, following the discoveryof payable quantities of gold near there that same summer, as well as one final post still further upriver at the settlement of Bettles, after Bergman flooded owing to its unfavorable position on low ground (Brown 1988:161). Bettles himself reported Bergman to be, at that time, at the head of steamer navigation (Bettles 1941, in Brown 1988:161).

Then, during the summer of 1898, 1200-1500 prospectors overflowing from the saturated Klondike stampede descended into the Koyukuk drainage from a multitude of overland trails, but primarily up the Koyukuk in steamers and boats of a variety of sizes (Schrader 1900). Gordon Bettles reported ca. 53-68 boats of various sizes containing upwards of 900 people on these water craft during that winter, as most of them would be stuck there for the winter of 1898-99 after an early freeze (Yukon Press January 1899, and Bettles 1941, in Brown 1988:162, 216). As a result of this stampede, numerous new settlements sprang up around the larger frozen-in steamers, including (New) Arctic City (located a few miles upstream from its older namesake), Red Mountain (located down river from Arctic City) and Peavey on the main channel, Soo City, Seaforth and Jimtown on the South Fork of the Koyukuk, and Beaver City and Rapid City up the Alatna River (see Figure 5.55 for locations of those falling within our study area). Images from this

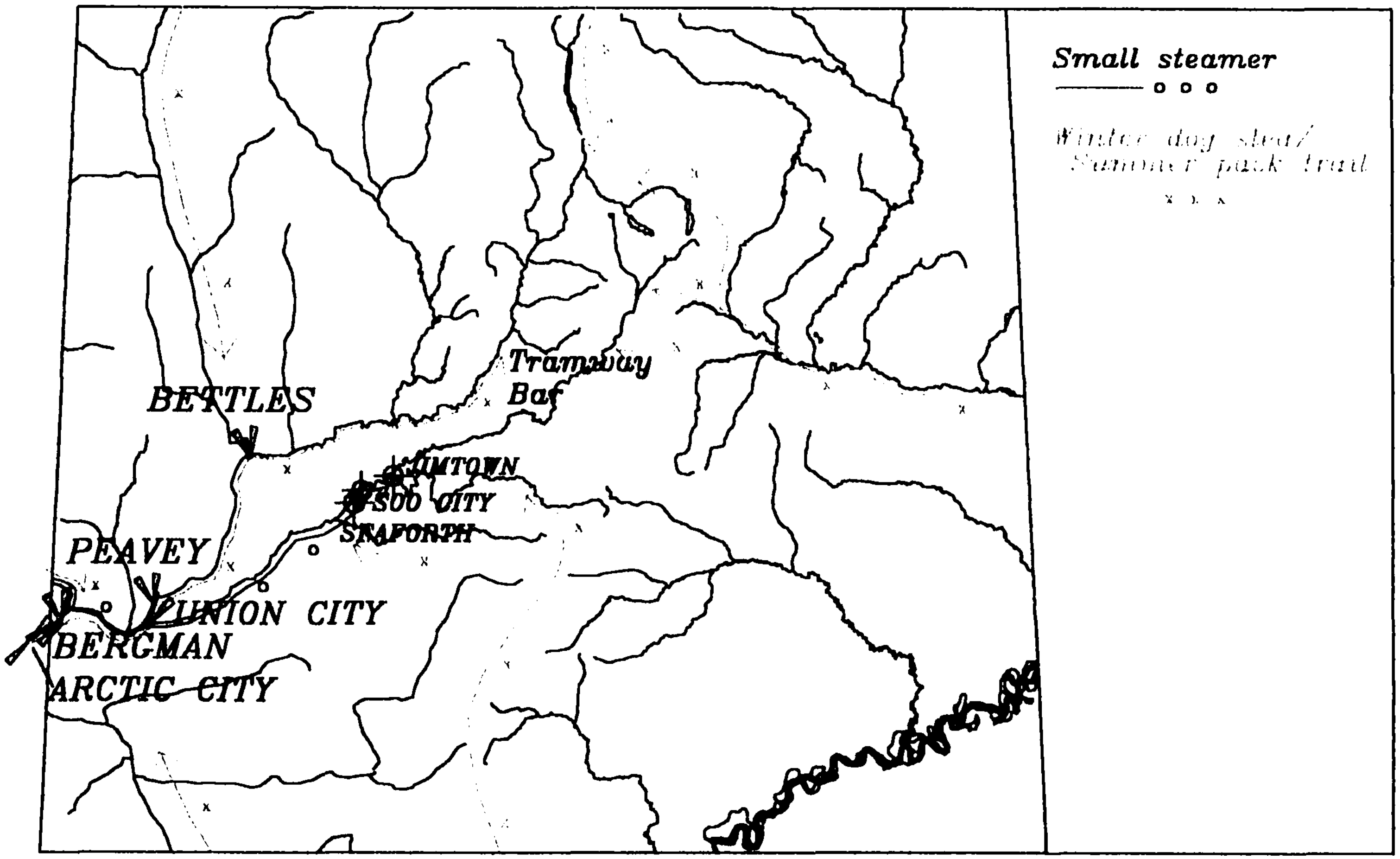


Figure 5.55 Approximate locations of 1898 stampede routes into the Upper Koyukuk drainage, and the subsequent winter 1898–99 settlement system. Note establishment of trading posts further and further up the Middle Fork (Bergman, Peavey, Bettles), and temporary settlements associated with this initial stampede.

winter were captured by stampeder Jasper N. Wyman (1988) as he traveled around some of these Koyukuk settlements. Of all these "cities," Peavey and Jimtown (which apparently consisted only of a cluster of cabins with no services present; see Bettles Hotel Register) were the only settlements not immediately abandoned after the river ice broke up in the spring of 1899.

By January 1899, Peavey became the first true "central place" on the Koyukuk providing more services than a simple supply store, when it was reported that U.S. Recorder J.R. Austin was stationed there (Yukon Press January 1899, in Brown 1988:216). Austin was apparently replaced by Register A.E. Snow and Receiver Roland Nichols by August 1 1899, who filled these positions until 1 June 1901 when the Land Office at this location was closed (Bureau of Land Management Archived Records; Alaska Forum Jan./Feb. 1900). Whether the papers from this post moved to Rampart, as was reported in the Rampart newspaper Alaska Forum (Jan/Feb 1900 p. 4) or were transferred to Coldfoot is unknown, as the earliest reference of a U.S. Deputy Marshal in Coldfoot dates to April 1902 (Bettles Hotel Register), and for a U.S. Commissioner in "early" 1901 (Schrader 1904).

In March 1899, one of these 1898-99 stampede prospecting parties discovered the first profitable placer deposits in the Upper Koyukuk on Myrtle Creek, a tributary of Slate Creek, itself a tributary of the Middle Fork of the Koyukuk. This find resulted in a second though smaller stampede when word finally got out (for population fluctuations, see Figure 5.21), and by fall 1899 there was a small tent city at the mouth of Slate Creek, called Slate Creek (Figure 5.35). The name of this developing town apparently changed to Coldfoot the following summer when naïve stampeders made it to the camp, got "cold feet", and left the country (Schrader 1900; Marshall 1991:39; for location of settlements, types and routes of transportation, and numbers and types of services and businesses in the settlements at this time, see Figure 5.56). As above, the centrality of the district shifted from Peavey to Coldfoot in 1901-02, which by this latter time had at least the following services and businesses: two general stores, one saw mill, one doctor, two lawyers, 2

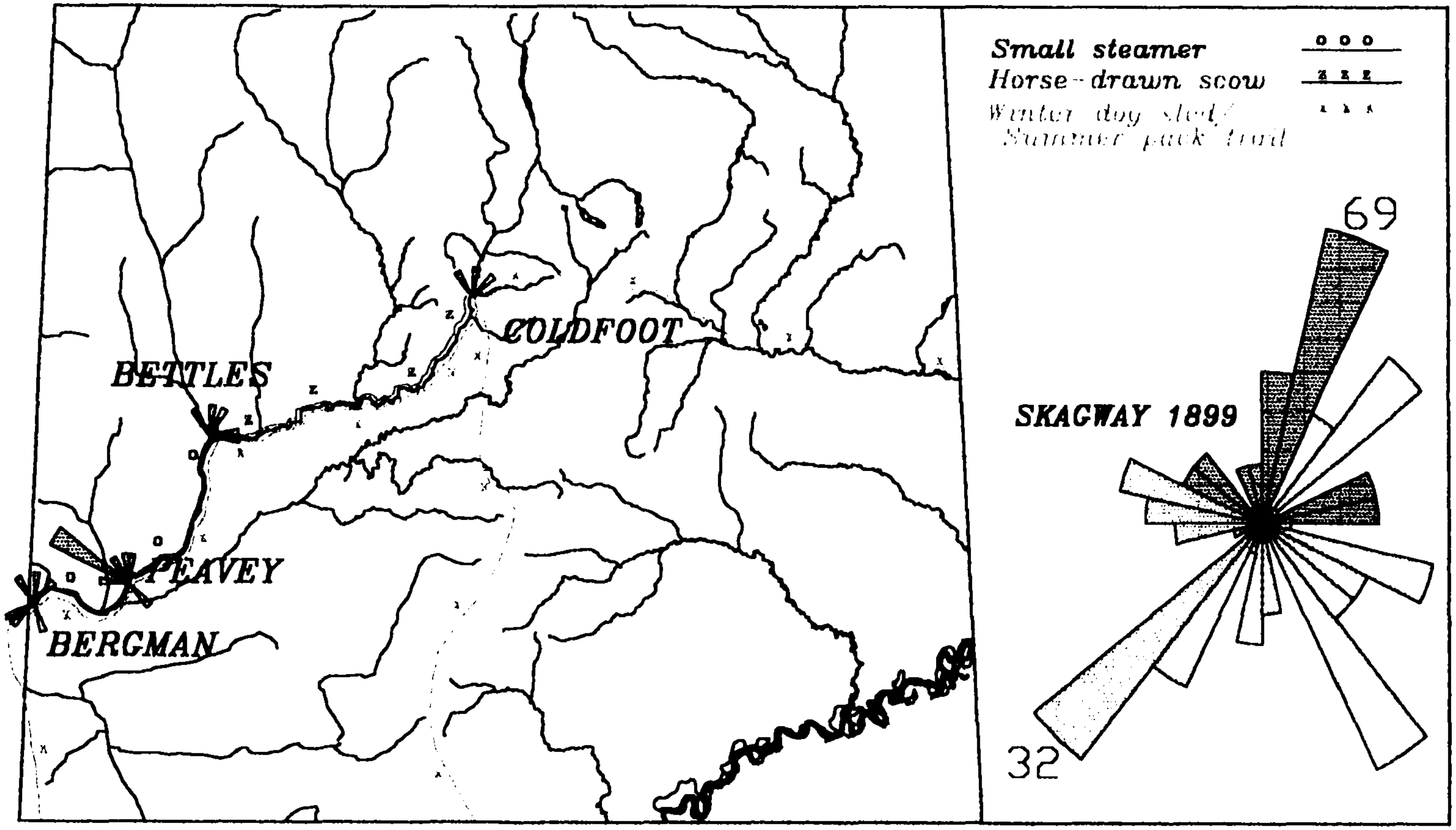


Figure 5.56 Transportation and settlement system, Koyukuk district and Upper Chandalar drainage (1899–1900). Note abandonment of most 1898–1899 stampede settlements (and others not in figure), and competition among intermediate transfer points en route to the newly established settlement and central distribution center at Coldfoot. Skagway in southeast Alaska added here at same scale for comparative purposes.

roadhouses, seven saloons, 1 barber, several prostitutes, and a post office, and was served by a U.S. Commissioner (who doubled as the Recorder and Justice of the Peace) and a U.S. Deputy Marshal with a jail (Bettles Hotel Register; Schrader 1904; Marhsall 1991; Ricks 1965). By this time (Figure 5.36) Bettles was the acknowledged head of steamer navigation on the Koyukuk, having a Northern Commercial Co. store and more importantly an N.C. Co. warehouse, though, as explained above, it was not always assured that steamers could ascend this far. At Bettles, goods were unloaded from the steamers and barges and transferred to the N.C. Co. warehouse (Drane n.d.:Photo #91-046-256), where they were stored until transported up the Middle Fork to Coldfoot, either via horse-drawn scows (Maddren 1913:VIIIA) or pole boats (Northern Navigation Co. 1912:34, top; Driscoll n.d.:Photo #64-29-217) in the summer, or winter dog sled trail up the river in the winter (see Figure 5.57). Bettles would remain the Koyukuk's key transfer point for decades to come. It should be mentioned that although small gasoline or diesel-powered launches were present on the Koyukuk from at least 1899 (see F.C. Schrader photo 437 of 1899, in Brown 1988:182-183), the shallowness of the Middle Fork prevented even these craft from profitably and reliably ascending to Coldfoot.

As a result, Coldfoot not only remained the most isolated mining camp in Alaska, it remained the most expensive to live and work in, for this last leg of the transportation trip (ca. 70 miles Bettles-Coldfoot) was exceedingly costly. For example, in 1903, Judge James Wickersham, while making a plea to the U.S. Congress for federal relief in helping to build a road system in Alaska, reported that the cost of shipping goods from Seattle to Bettles cost $135 a ton, and would cost an additional $200 a ton to get the supplies from Bettles up to the diggings at Coldfoot, only ca. 70 miles further upstream (Wickersham 1904). As has been endlessly recorded by contemporaries of the Koyukuk district, transportation costs would remain the key variable affecting the development of this region (e.g., Maddren 1913:30-31; Wickersham 1904; McKenzie 1904; Anonymous 1908:91-92; Hill 1909:213).

Figures 5.37-5.41 illustrate the continual shifting nature of settlement functions in

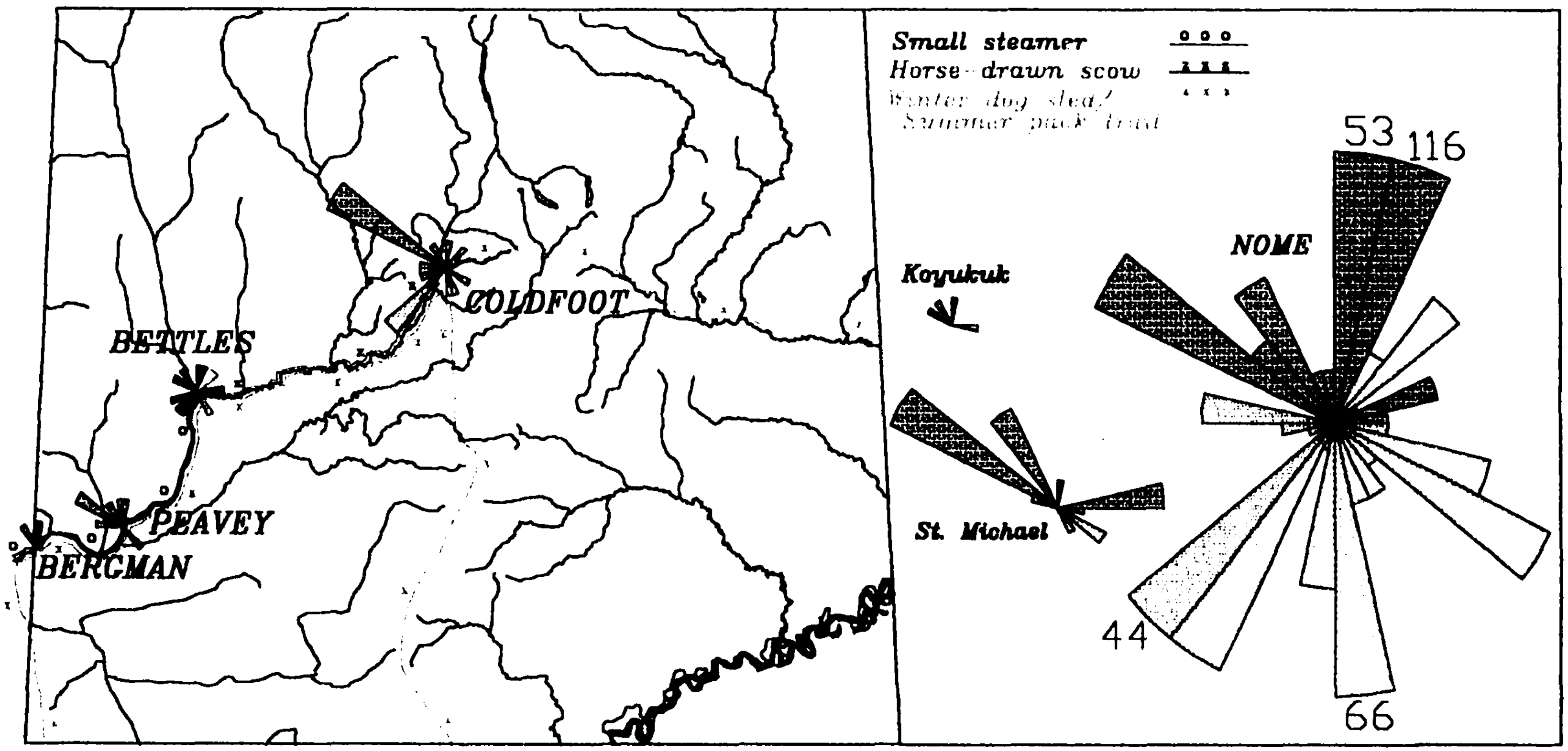


Figure 5.57 Transportation and settlement system, Koyukuk district and Upper Chandalar drainage (1901–02). Note quick ascendency of services at Coldfoot, and rise of Bettles as the principal intermediate transfer point to the diggings around Coldfoot. St. Michael, at the mouth of the Yukon, and Koyukuk near the mouth of the Koyukuk River, are added as part of the Koyukuk districts transportation system. Nome added for comparative purposes.

the Upper Koyukuk through time (see Figures 5.58-5.62 for geographical displays of these same sequential time periods). Bergman still maintained a supply post, hence its Secondary Distribution Point status (see Figure 5.37) to its surrounding area until its abandonment around 1907-08; Peavey loses its centrality to Coldfoot 1901-02, becomes merely a transfer point when water is too low to allow full passage to Bettles, and ultimately loses its supply post around 1906. As rich shallow placers became exhausted in the Slate-Myrtle Creek area northeast of Coldfoot, the result was declining annual returns between 1904 and 1907 (see Figure 5.21). However, rich, deep placer strikes in 1907 on Nolan Creek (a tributary of Wiseman Creek, a Middle Koyukuk tributary only ca. 11 miles north of Coldfoot) shifted attention northward (Anonymous 1908; Hill 1909; Hoare 1908; Rowe 1908), resulting in both increased gold output and an increase in population. Along with this shift of mineral focus went the services and businesses centered at Coldfoot. The solitary Wright's Roadhouse reported at the mouth of Wiseman Creek in 1905 (cf. Stuck 1905, Feb. 25-26; see Figures 5.38 and 5.59) developed quickly during the summer of 1908 into "Wright City" and "Nolan" with the addition of "a number of stores, saloons," and the roadhouse, along with several other unspecified structures under construction (Hill 1909:213; Williams 1910:221; see "Wiseman," Figures 5.39 and 5.60).

By 1909 a post office had been established at this new settlement (under the name of Nolan; Ricks 1965: 46, 71), and although the numbers of types of services and businesses at this time were the same between Coldfoot and this settlement (see Figure 5.50, Coldfoot vs. Wiseman 1907-08), Coldfoot still maintained the Commissioner's and Deputy Marshal's posts, thus centrality for the district. By 1911 the new settlement's name had settled on "Wiseman" (Polk's 1911-12; which it remains to this day), and both federal appointments had shifted here from Coldfoot (Figures 5.40 and 5.61). Coldfoot, still maintaining a store, roadhouse, and most importantly a post office (closed 31 May 1912, mail to the "Nolan" post office in Wiseman; Ricks 1965:28), retained some measure of centrality, at least enough to justify a surrounding population's mail and supply needs (see Figures 5.40 and 5.61). Wiseman, however, was just reaching its heyday (ca. 1911-

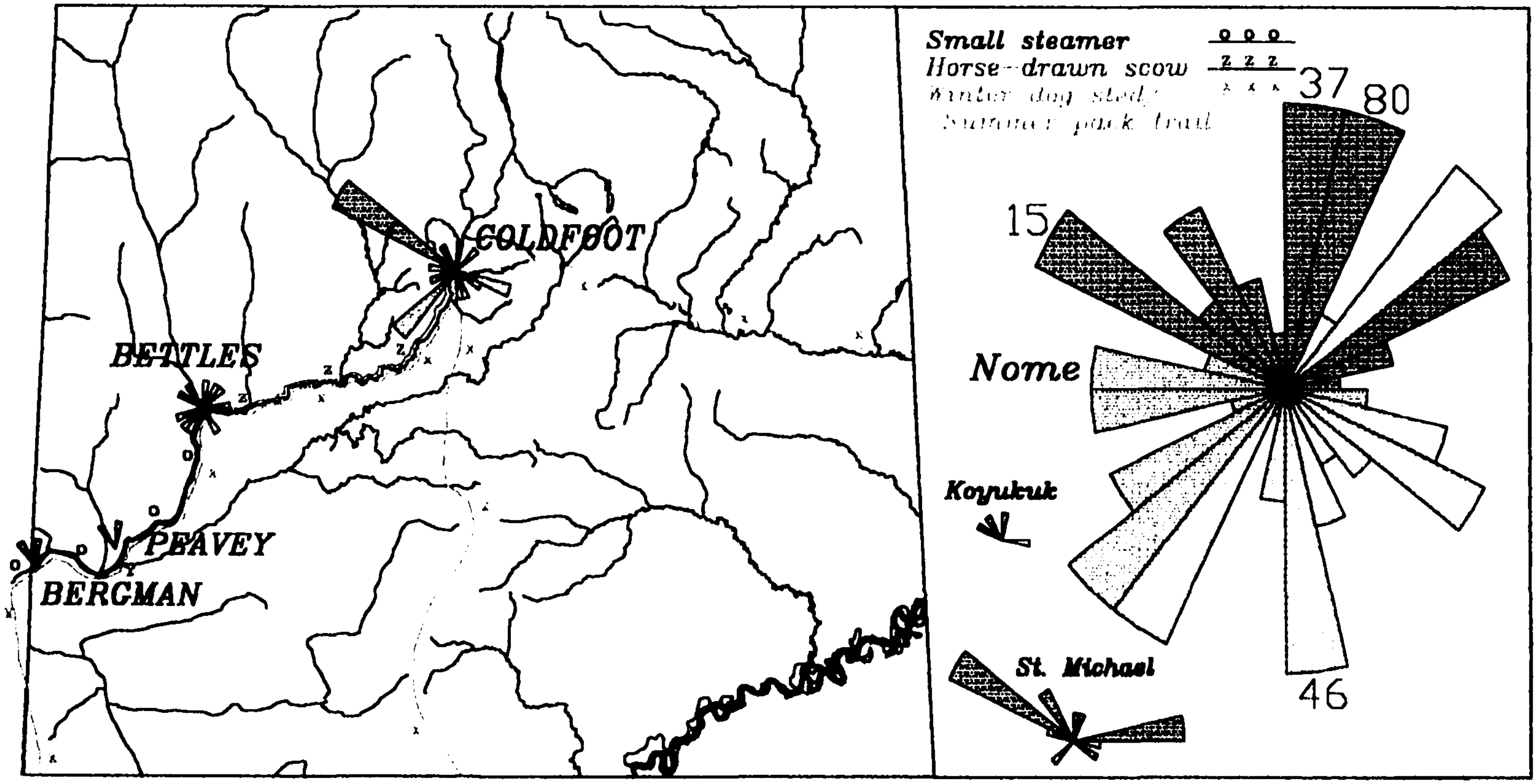


Figure 5.58 Transportation and settlement system, Koyukuk district and Upper Chandalar drainage. Note decline of Bergman and Peavey relative to Bettles. Koyukuk and St. Michael added as part of the Koyukuk district transportation system. Nome added for comparative purposes. 1903–04.

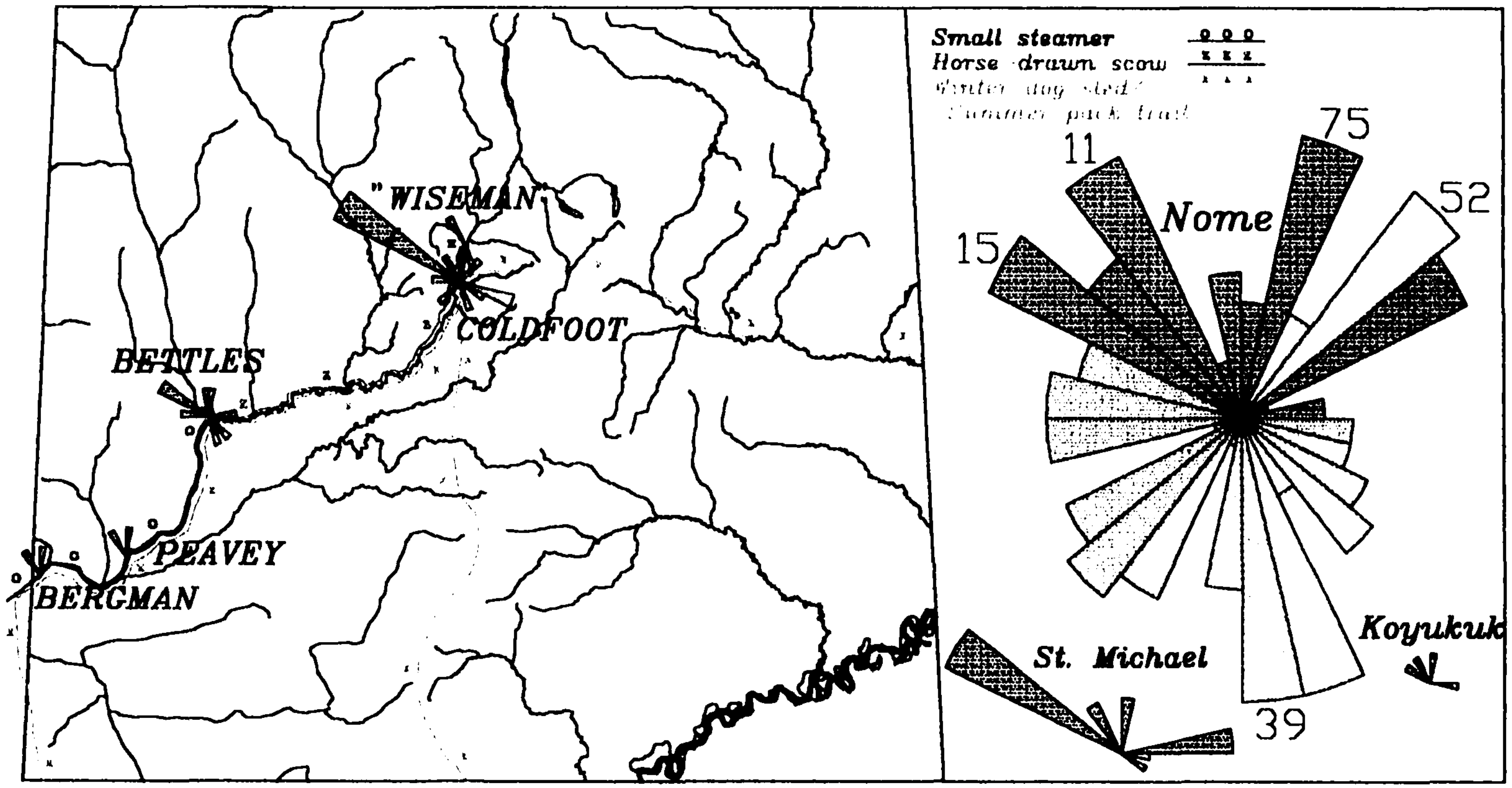


Figure 5.59 Transportation and settlement system. Koyukuk district and Upper Chandalar drainage (1905–06). Note establishment of Wiseman further upstream. Note also continued lack of improvement in inter–district transportation methods in this isolated mining district. St. Michael and Koyukuk added as part of the Koyukuk district's trnasportation system, and Nome added for comparative purposes.

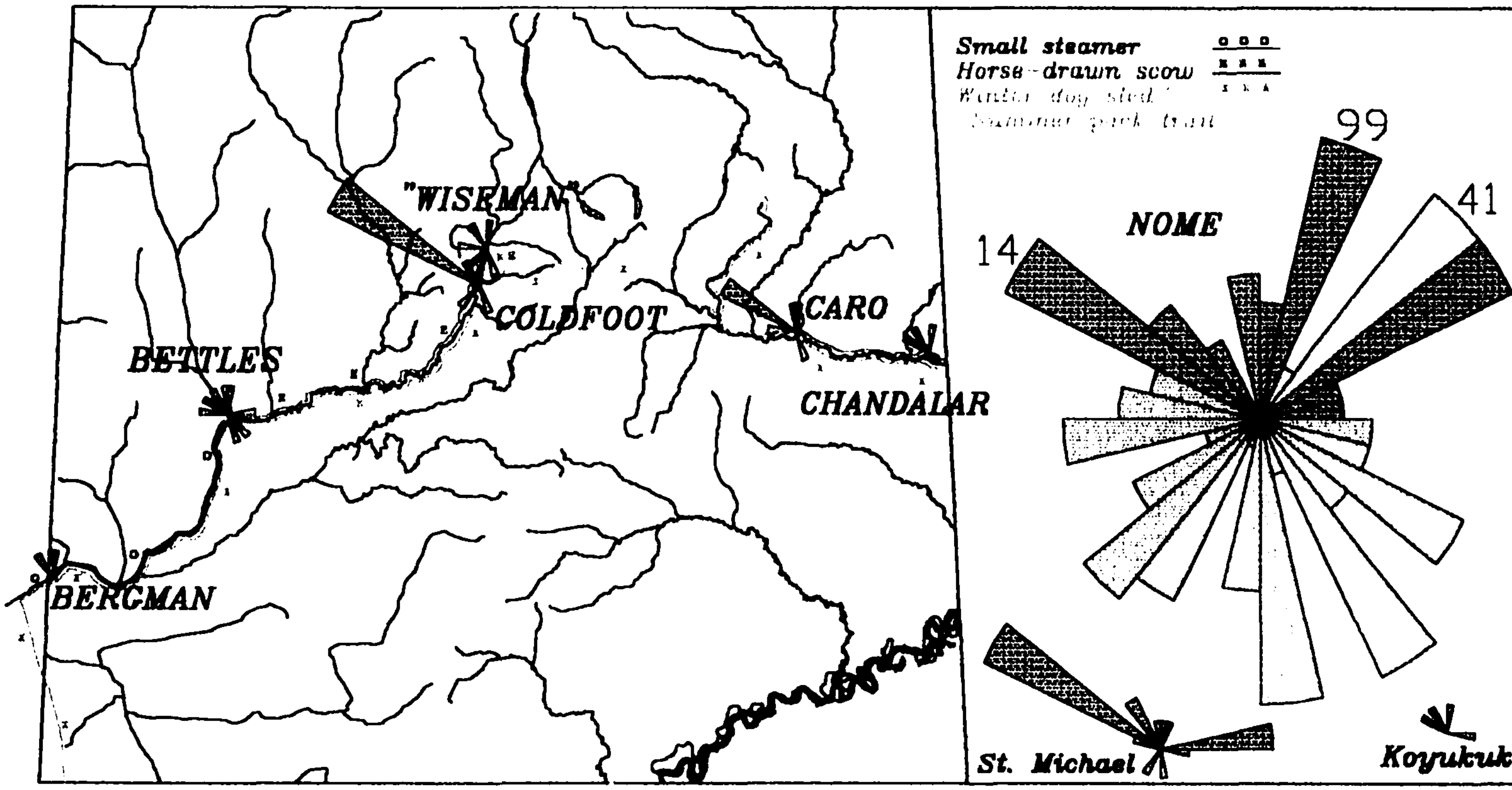


Figure 5.60 Transportation and settlement system, Koyukuk and Chandalar districts (1907–08). Note establishment of adjacent Chandalar district, and ascendency of Wiseman following new rich strikes in that vicinity. St. Michael and Koyukuk added as part of the Koyukuk district's transportation system, and Nome added for comparative purposes.

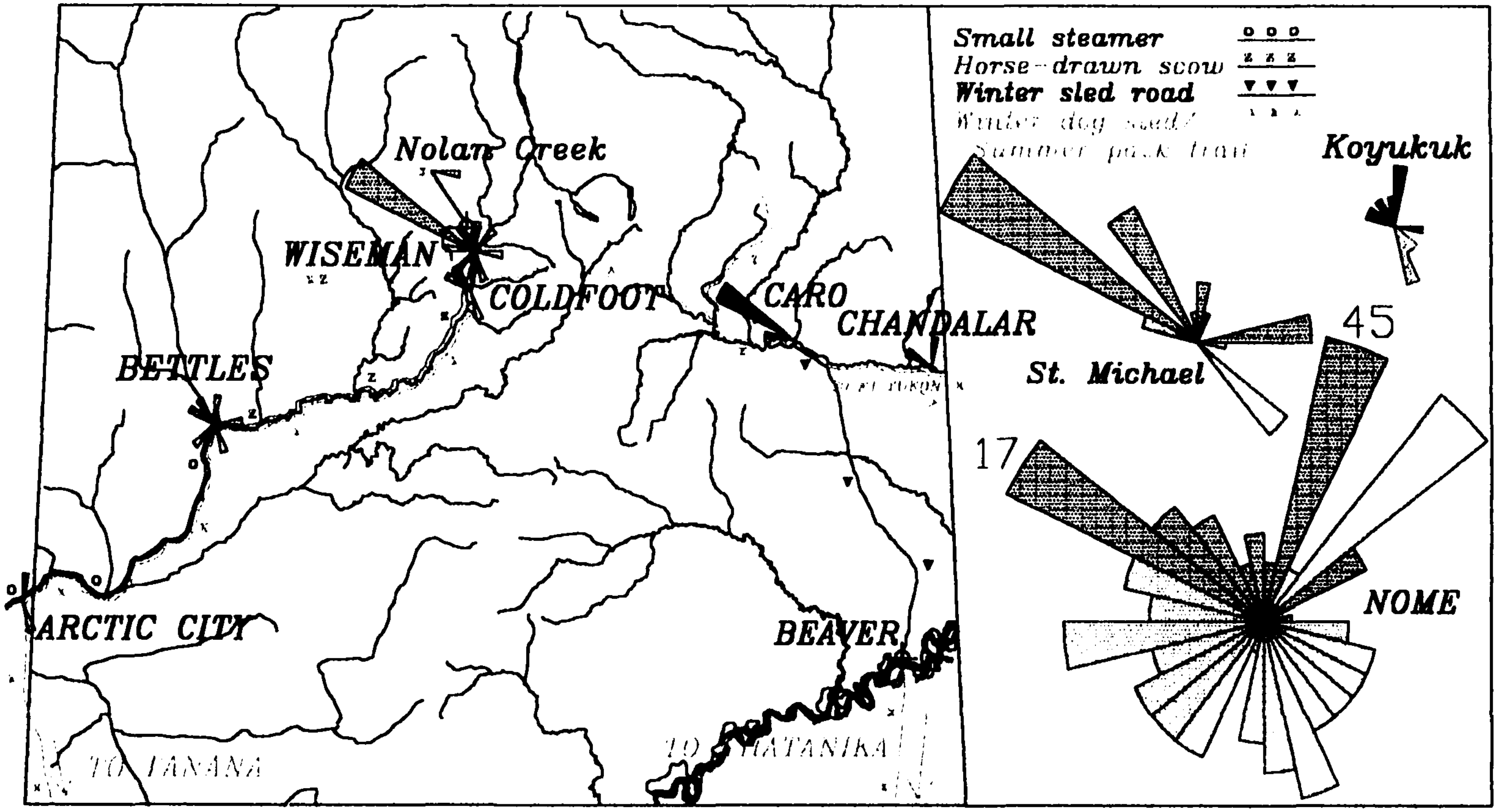


Figure 5.61 Transportation and settlement system, Koyukuk and Chandalar districts (1911–12). Note rise of Wiseman to central distribution center status, Coldfoot's decline, the inclusion of services on Nolan Creek, and the establishment of anopther overland route into this general area from Beaver to Caro. Chatanika is connected directly to Fairbanks via the Tanana Valley Railroad.

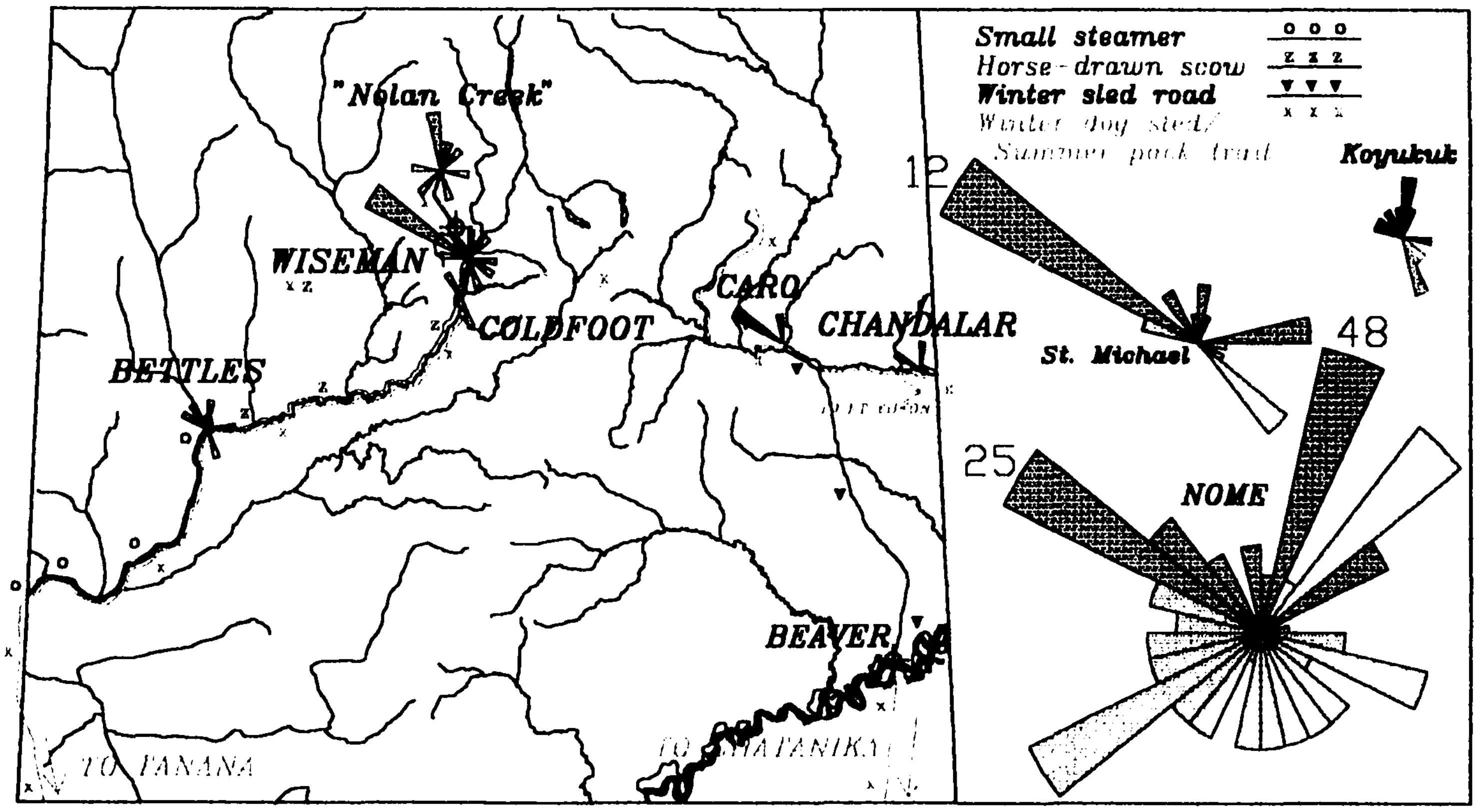


Figure 5.62 Transportation and settlement system, Koyukuk and Chandalar districts (1915–16). Note rise of services available on Nolan Creek, central distribution center status of Wiseman, and overall decline of services at Coldfoot.

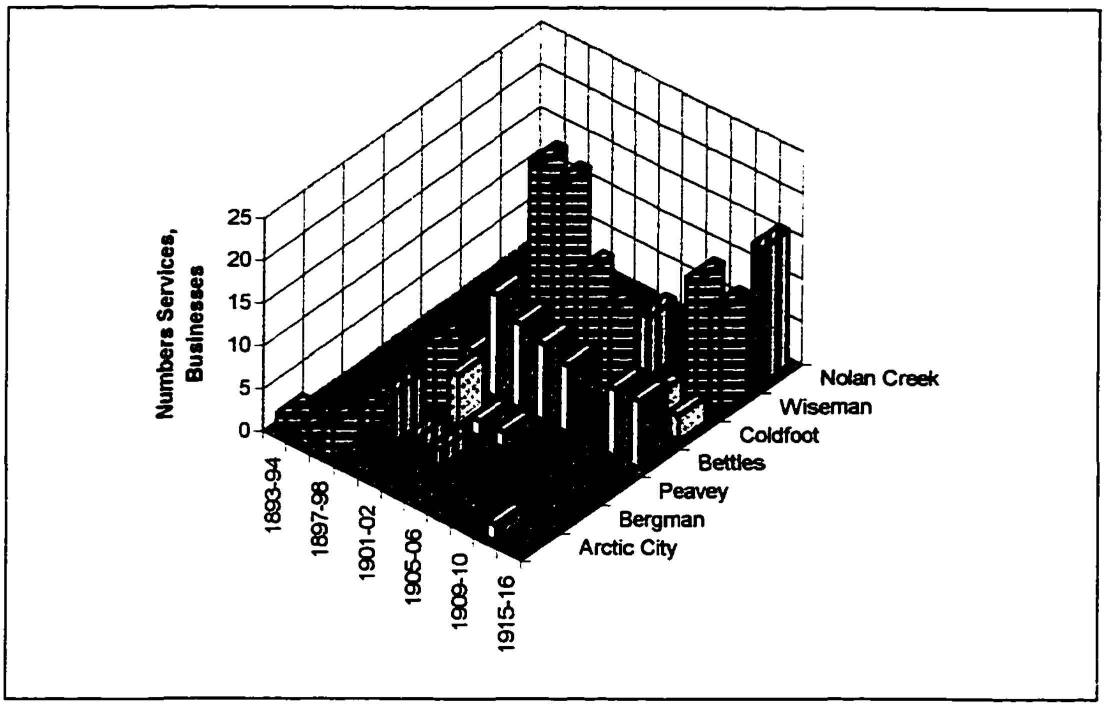
15/16), supplying the economic, social, and political needs for the major deep-hole diggings on both Nolan Creek to the northeast (e.g., by 1909, ca. 50 steam plants were operating in the Nolan Creek area), as well as Hammond Creek diggings to the north, where a rich strike had drawn much attention in 1911 (Hurja 1914:416). It was at this time that R.L. Polk & Co. (1915-16:393-394) provide different population listings for "Wiseman" (indicated as 70 mi. northeast of Bettles) and "Nolan" (85 mi. northeast of Bettles). While confusion by a Seattle-based publisher regarding an isolated mining settlement system located thousands of miles apart is certainly not out of the question, what lends legitimacy to this division (Wiseman vs "Nolan") is the separate and non-overlapping general store proprietors and roadhouse personnel listed separately for each place. That most of these people actually *were* from the Upper Koyukuk is confirmed from U.S. Census records taken in Wiseman in 1910 (U.S. Census 1910).

However, there is no firm evidence that there ever was an acknowledged separate settlement northeast of Wiseman called "Nolan." Consider the following sequence: (1) Stuck (1905, Feb. 25-26) reports "Wright Roadhouse" at the mouth of Wiseman Creek, (2) Hill (1909) reports news dating to ca.1908-09 which indicates a Wright City at the mouth of Wiseman Creek, (3) letters by Bishop P.T. Rowe and Reverend A.R. Hoare (March 30 and April 1, 1908) briefly outline their trip through the Upper Koyukuk includes stops at (sequentially upstream) Allakaket, Bettles, Coldfoot, and Nolan (no mention of Wright's, or Wiseman), (4) Williams (1910:211), a correspondent who visited the Upper Koyukuk ca. 1909-10, states explicitly that "Nolan" was located at the mouth of Wiseman Creek and was formerly called Wright's; (5) the establishment of a post office named "Nolan" on 24 August 1909 with William A. Wood as postmaster (Ricks 1967:46); and (6) based upon information obtained during a trip to the Upper Koyukuk in 1909 and information since that date, Maddren publishes in 1913 a map indicating "Nolan" at the mouth of Wiseman Creek (Maddren 1913: foldout map). Another important point is that the "Nolan" post office never officially closed, with mail indicated as being sent to a nearby establishment (as it did for Coldfoot in 1912, and <u>every</u> other abandoned mining town in Alaska!; Ricks 1965), but instead "changed its name" from "Nolan" to "Wiseman" on 16 March 1923 (and finally discontinued on 24 July 1956).

Additionally, Margaret and Olaus Murie traveled to and stayed in the Wiseman area in 1924, reported that "There are seven white women here [in the Wiseman area], but they are nearly all up at Nolan Creek now, at the mines. There are never very many [people] down in town [i.e., Wiseman]; we all have cabins here but are at the mines most of the time" (Murie 1978: 170). Also, Edith Smith who lived in Coldfoot and Wiseman 1919-1926 recounted decades later (Warbelow 1993:51-52) how she married Jack White, (who owned and operated the horse scows from Wiseman to Bettles) on May 17 1920 "in Nolan where White had a cabin." And lastly, Marshall (1991) visited Wiseman in 1929 and 1930 and gathered extensive historical and ethnographic information regarding the Upper Koyukuk community in part from old timers who arrived in the country in the late 1890s. He succinctly states (1991:42) that the town was first called Wrights, then Nolan, then Wiseman, yet gives no mention anywhere in the book that a separate community ever existed on Nolan Creek (or anywhere) called Nolan. Thus, we are left with the probability that a separate clustering of stores, services, and businesses likely existed on or along Nolan Creek (c.f., R.L. Polks 1915-16), that it was only locally and loosely known as "Nolan," and that the exact number and types of services that existed there likely fluctuated through time based upon the needs of the population. This scenario, if accurate, is typical of a placer mining boom economy. It is also noteworthy that gold production figures for the Koyukuk as a whole decline steadily post-1917, indicating the initiation of a post-"boom" phase after this date (see Figure 5.21). Thus, on Figures 5.41 and 5.62 "Nolan Creek" is presented as a Secondary Distribution Point relative to Wiseman, which still remains the recognized central place for the district.

Coldfoot continued to decline. The post office closed in 1912, and by 1915-16 few people lived in Coldfoot (see Chapter 2), where only a store and roadhouse remained. Both are reported in operation side-by-side in 1917 and were run by a white man named Sibley and his native wife (Newman 1978:31). Coldfoot still was recognized as being at a transfer point, though, for the Alaska Road Commission felt it necessary to upgrade the route between Coldfoot and Wiseman from trail to sled road capacity (ARC 1917), whereas all trails leading into Coldfoot from the outside still remained at trail status. Two years later in 1919 Edith Smith reports only a single roadhouse, making no mention of a store or the Sibleys (Warbelow 1993:43). Ultimately, in 1924, as the Muries traveled through Coldfoot en route to Wiseman they reported "two rows of deserted cabins which had once been the busy mining camp of Coldfoot. ...One family still lived there, Minano the Japanese, his Kobuk wife, and their numerous children. The oldest boy came out to greet us and to unlock the big log cabin, once the roadhouse and saloon, now used by the few travelers" (Murie 1993:165). Thus Coldfoot had merely become an Intermediate Supply Point (providing a safety cabin) on the dog sled transport route between Wiseman and the outside world. By 1930, Marshal (1991:320) reports Coldfoot as completely abandoned. Figures 5.63a-b summarize the data in Figures 5.34-5.41, showing the shifting status of the Koyukuk district's settlements through time and space (Arctic City furthest down river, Nolan Creek furthest up river).

The Innoko district data show a dramatic initial fluctuation of settlements during the first 2-3 years of the district, as both competition between settlements and new gold strikes shifted population and services across the landscape (Figure 5.64; see also Figures 5.65-5.69 for geographical display of the transportation and settlement system of the adjacent Innoko and Iditarod districts, 1907-1916). Dishkakat was the only settlement in upper Innoko drainage prior to the 1907 gold rush stampede, inhabited since at least the late-nineteenth century by native Athabaskans (Jette n.d.; U.S. Census 1890, 1900). This settlement is at the approximate head of small steamer navigation on the Innoko; depending upon water level, steamers might ascend further to within 55-75 miles of the upper Innoko diggings (see Figure 5.67), or might fall short. Goods would have to proceed the rest of the way in 3-4 ton light-draft flat-bottomed scows or 1-2 tons small poling boats (Brooks 1909:246). Since Dishkakat was also at the mouth of the Mud River, along which an existing trail lead northwestward towards the Yukon River, this was a



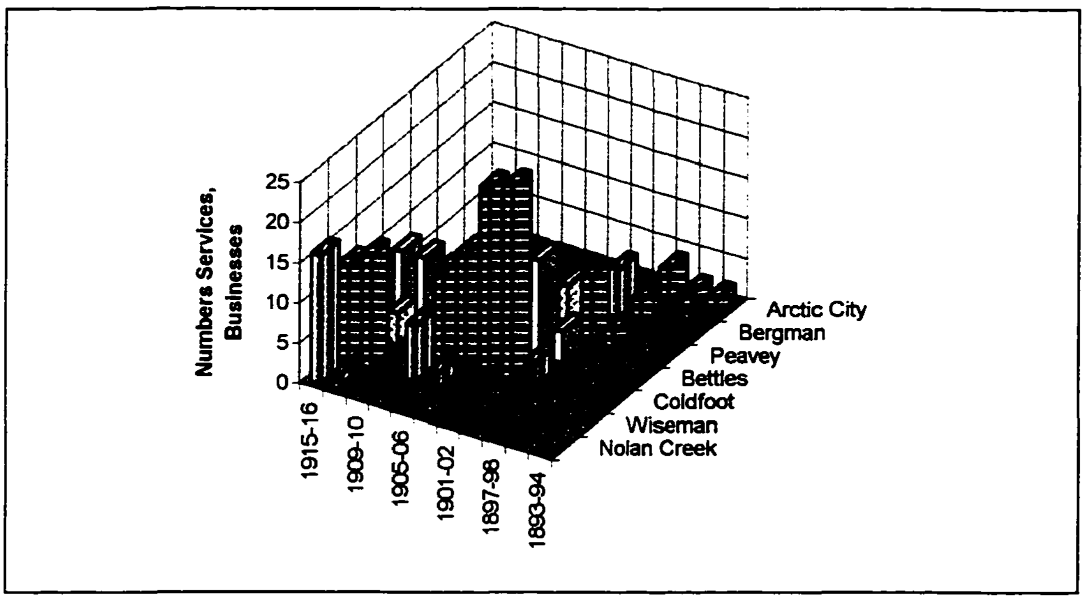


Figure 5.63a and 5.63b (reverse side) Koyukuk mining district transportation and settlement system, 1893-1916. Arctic City furthest downstream, Wiseman and Nolan Creek furthest upstream. Note change in settlement function sequentially upstream through time (red/horizontal: central distrib. center; dark red/vertical: secondary distrib. town; yellow/plain: intermed. transfer point; pink/cross hatch: both central & transfer).

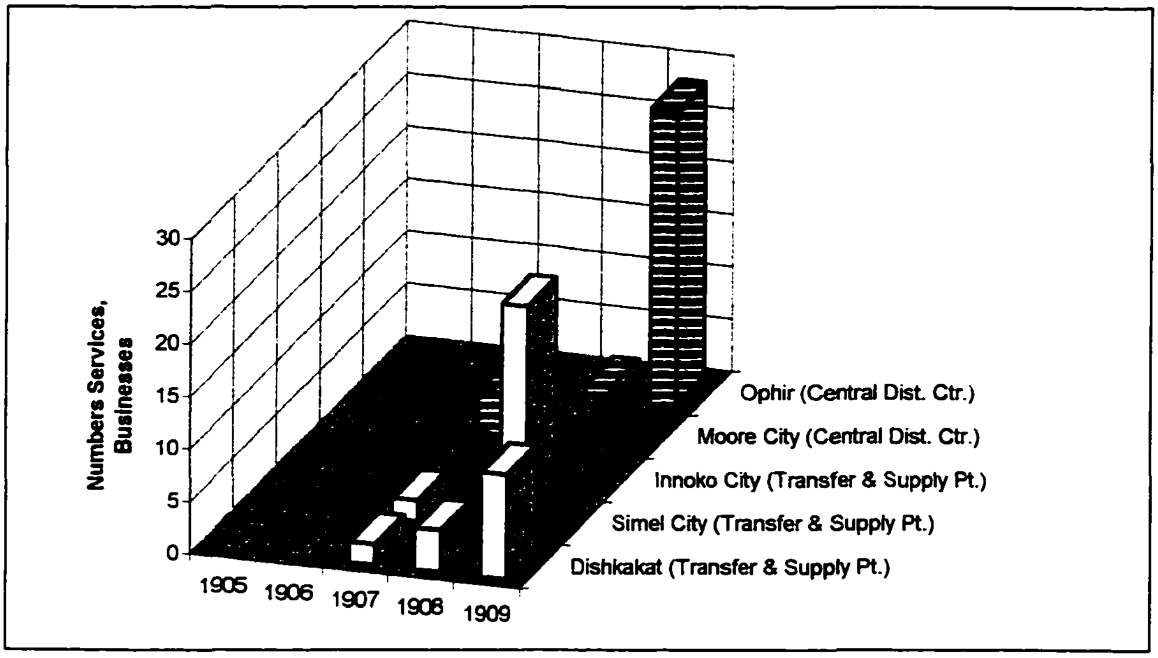


Figure 5.64 Innoko mining district transportation and settlement system, 1907-1909. Note change in central distribution center, and competition between intermediate transfer points. Note also existing Athabaskan native village at Dishkakat prior to the gold rush stampede in 1907. Red/horizontal: central distribution center; yellow/plain: intermediate transfer point.

natural sight for the supply store which, along with a post office, was established in 1907 (Figure 5.65). For three months in the summer 1908 American businessmen tried unsuccessfully to establish a new settlement called Innoko City, a little upriver from Dishkakat at the mouth of the Dishna River. Two issues of this town's weekly newspaper, the Innoko Miner, came out on 16 and 23 July 1908, which reported 1 general store/ restaurant, 1 other general merchandise store, 1 books/ stationery/ cigar store, 1 retail outlet for tobacco, 1 grocers, 2 restaurant/bakeries, 2 saw mills, 2 saloons, 1 barber shop, a post office, and the Innoko Improvement Club (Figure 5.66; Innoko Miner 1907). Unfortunately, the town was deserted after food stores ran out and were not re-stocked. Innoko City was never re-occupied. Brooks (1909:240) comments upon these fluctuating early years in his 1908 report: "Attempts were made to form settlements at the points

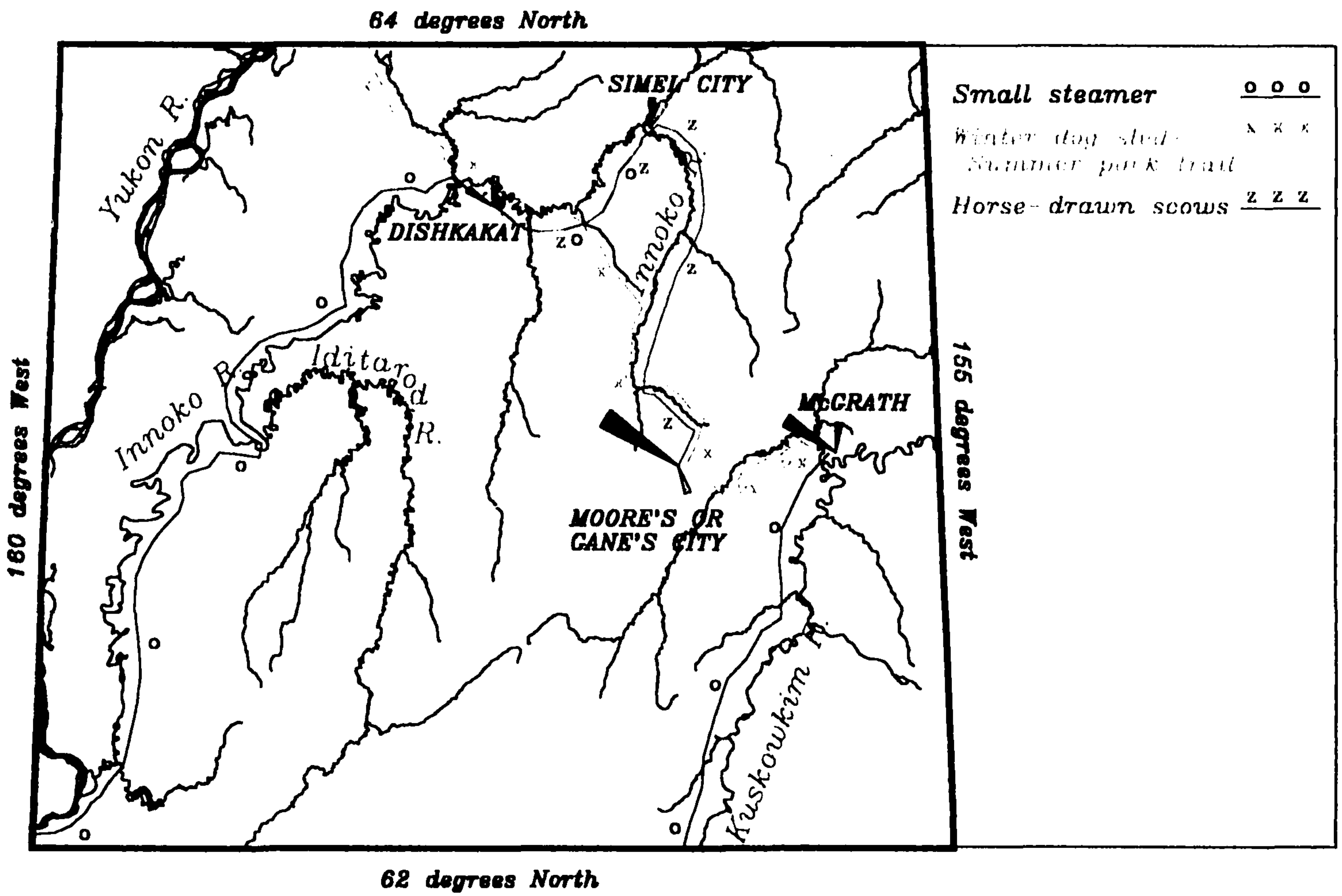


Figure 5.65 Transportation and settlement system, Innoko district (ca. 1907). Note founding of central distribution center at Gane's City, and competing intermediate transfer points Dishkakat and Simel City.

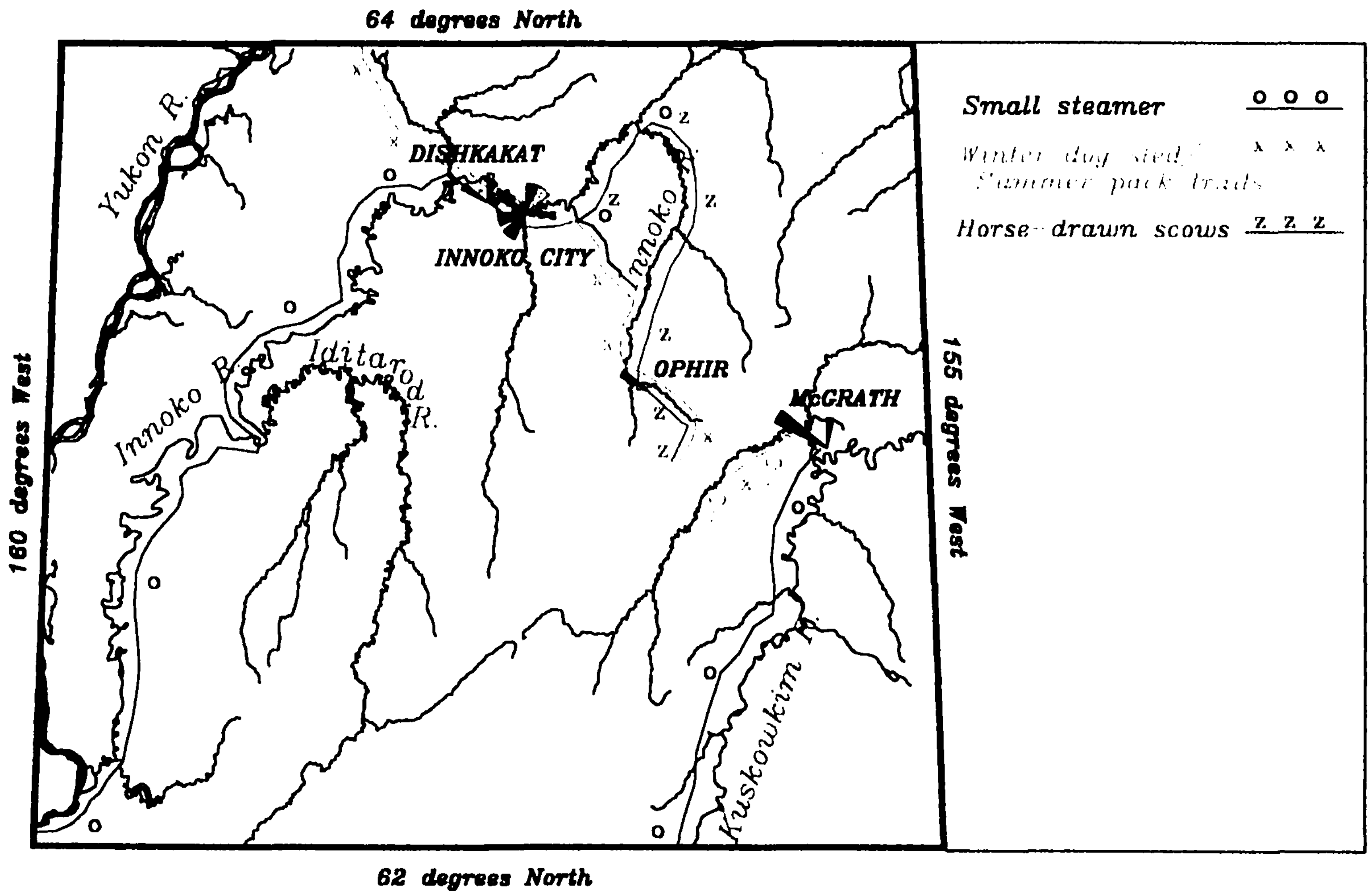


Figure 5.66 Transportation and settlement system, Innoko district (ca. 1908). Note shift of central distribution center to Ophir and continued intermediate transfer point competition between at least Dishkakat and Innoko City.

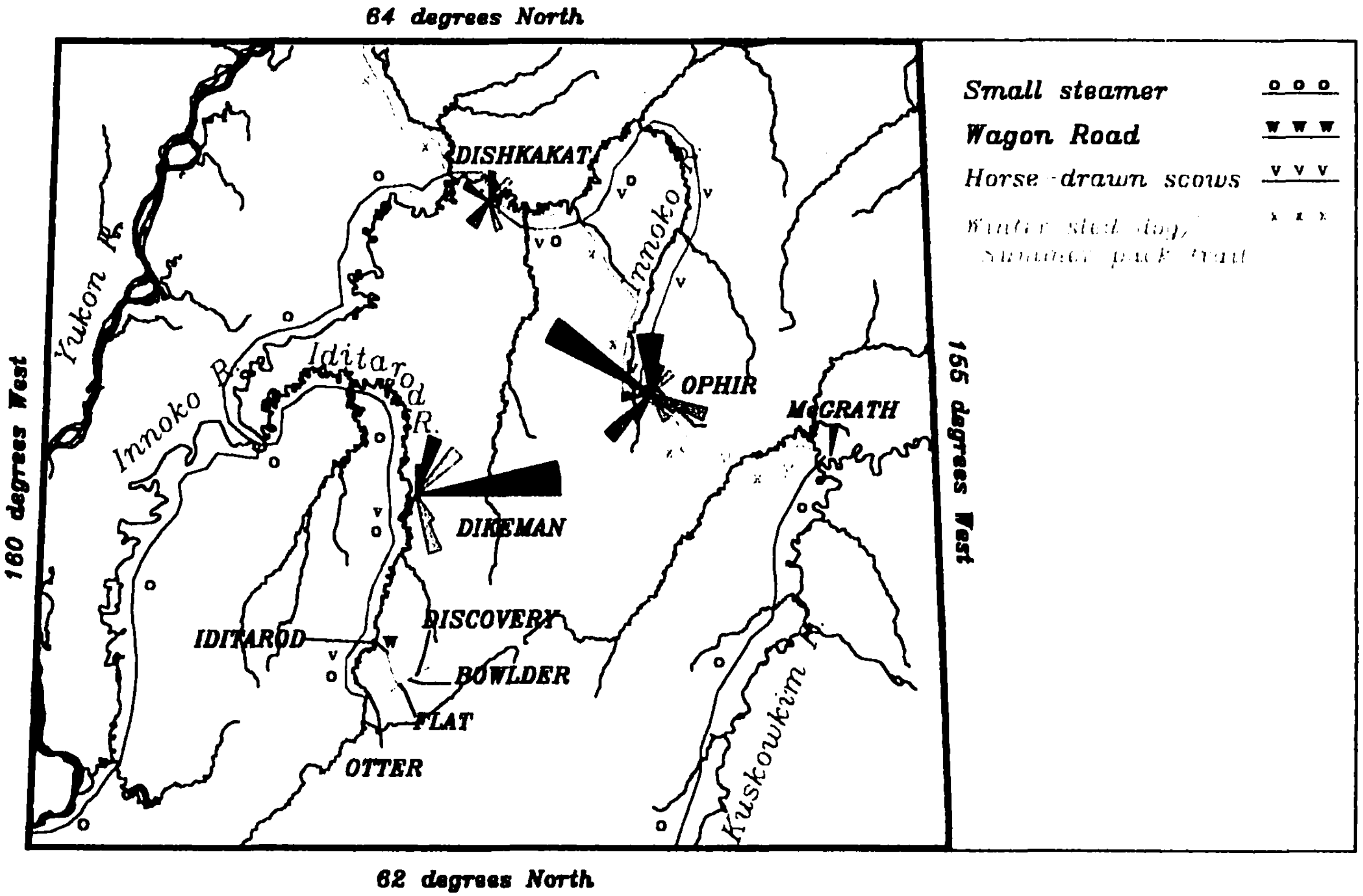


Figure 5.67 Transportation and settlement system, Innoko and Iditarod districts (ca. 1910). Note Dishkakat "winner" in intermediate transfer point competition in the Innoko, and immediate full establishment of intermediate transfer point (Dikeman), central distribution center (Iditarod), and secondary distribution points closer to the diggings in the Iditarod district.

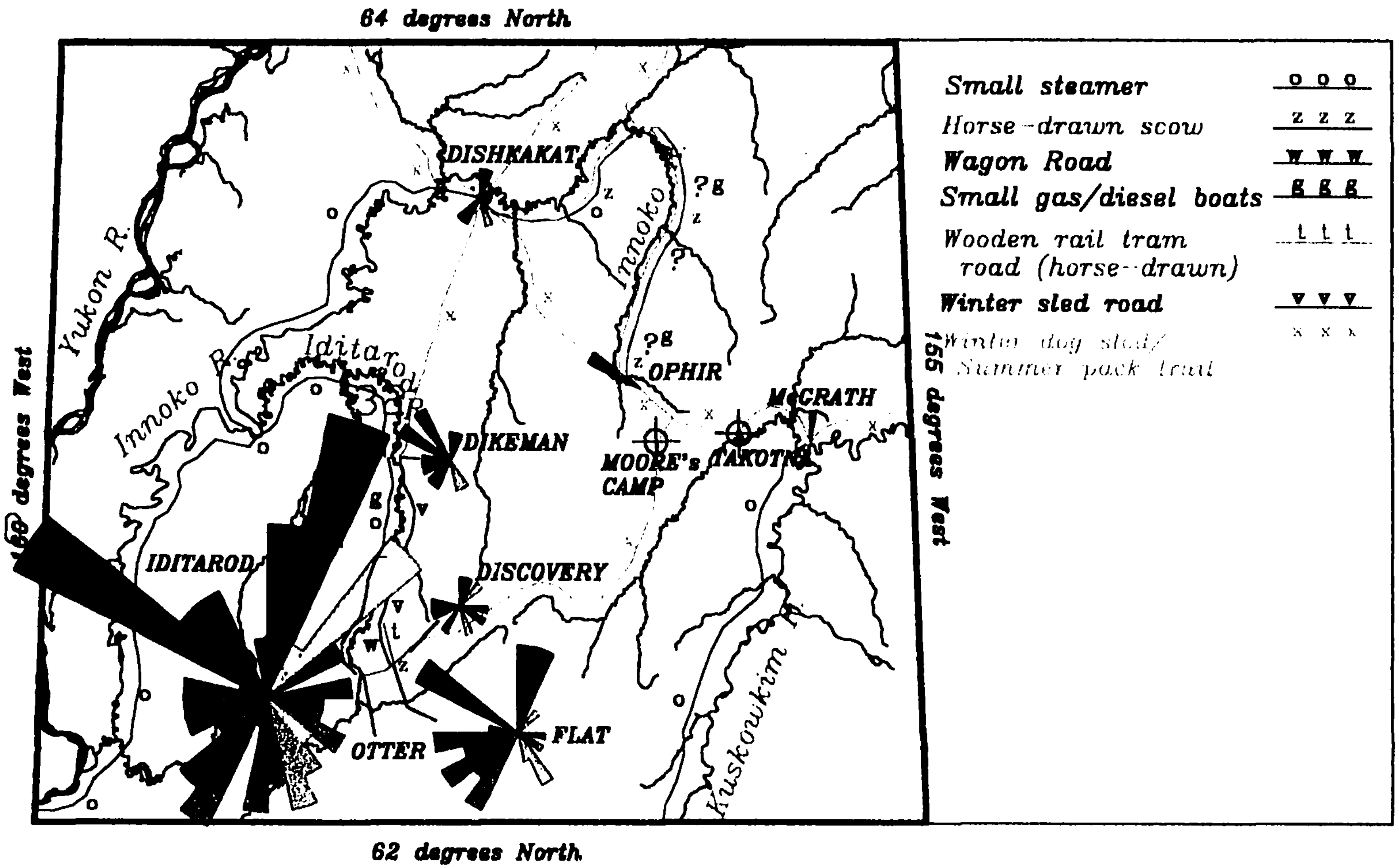


Figure 5.68 Transportation and settlement system, Innoko and Iditarod districts (ca. 1912). Note development of internal overland transportation system within and between the districts, and only summer pack/winter dog sled trails as overland access into either district from the outside.

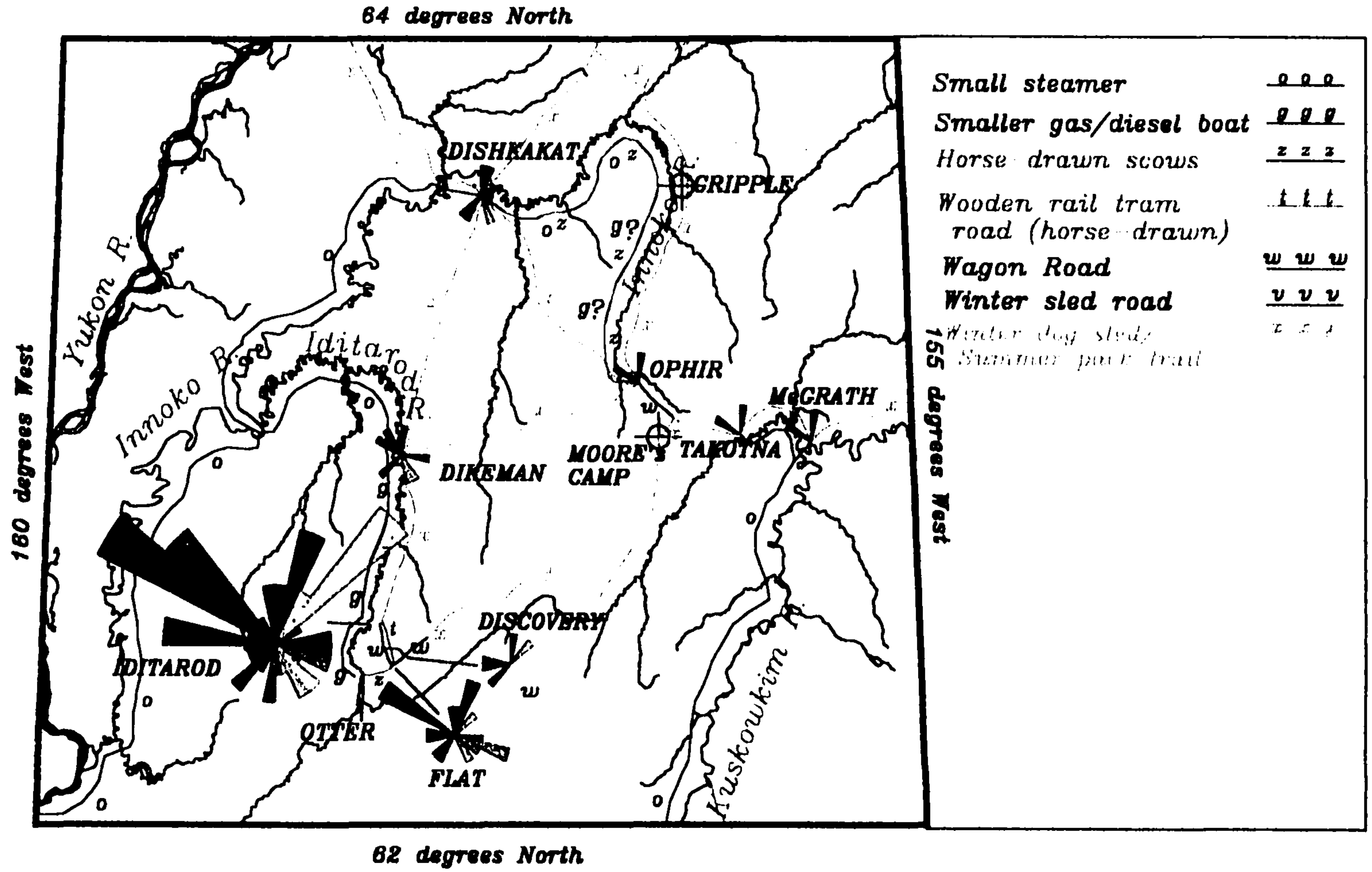


Figure 5.69 Transportation and settlement system, Innoko and Iditarod districts (ca. 1916). Note slight upgrades in the transportation system in the immediate vicinities of their central distribution centers (Ophir, Iditarod). Flat would soon rise to central distribution center status in the next few years at the expense of Iditarod.

where the various steamboats landed their passengers and freight. but these settlements were maintained for only a short time," located variously 75-100 miles below Ophir on the Innoko (see below). Thereafter, Dishkakat became the acknowledged head of navigation to the Innoko district.

Up the Innoko at the actual site of the diggings, attention initially focused on a small settlement that grew up near discovery claim on Ganes Creek, the site of the 1907 stampede. Here were located the federal positions Deputy U.S. Marshal, U.S. Deputy Recorder, and U.S. Commissioner during that first year, all of which shifted the following summer to the new town of Ophir at the mouth of Ophir Creek as a result of a new stampede to that creek in 1908. By 1909-10 Ophir had grown into the Central Distribution Center for the Innoko district (contrast Figures 5.65-5.68; Figure 5.64 summarizes the Innoko settlement data 1907-1910). Unfortunately, data for Ophir and any camp that remained on Ganes Creek is sketchy after this date. However, records indicate that Ophir would remain the key and essentially only service-oriented settlement in the Upper Innoko for the duration of the district (e.g., Brooks 1909 to 1925), with Brooks specifically mentioning that only two settlements "of substantial character" remained in the Innoko drainage: Ophir among the diggings and Dishkakat which served as a "halfway station" (Brooks 1909:240).

In contrast to the long-term Koyukuk and the initially-dynamic Innoko settlement fluctuations, the Iditarod district illustrates a more stable, non-fluctuating settlement system (Figures 5.42-5.43). Following the initial rush to the area in 1909, Dikeman was founded at the head of low-water navigation for small steamers on the Iditarod River, with the prospecting population descending along Otter Creek and vicinity, the site of the gold strike. While many people would leave that first year owing to a general lack of supplies, a renewed stampede ensued the following summer 1910, and Iditarod would be founded at the furthest point upriver from Dikeman on the Iditarod River at the head of high-water navigation. In addition, small towns would spring up in close proximity to each other along Otter Creek, all at the mouths of smaller gold-bearing tributaries. First up Otter Creek was Flat, then two miles further up was Bowlder, and then Discovery just an additional two miles further (Figure 5.67). While a transfer point named Otter developed early at the mouth of Otter Creek, serving as a transfer point from small water craft to horse-drawn scows or pole boats up Otter Creek, it quickly became abandoned after a privately financed wooden rail horse-drawn tram was constructed overland between Iditarod and Flat. Iditarod quickly became the commercial, political, social, and religious center of the new district (Figures 5.68-5.69). Bowlder's population was apparently absorbed by either Flat or Discovery within a year. For at least ca. 8-10 years thereafter, the Iditarod district's settlement pattern was set: Dikeman and Iditarod at the acknowledged heads of low- and high-water navigation on the Iditarod, respectively, and Flat and Discovery as smaller Secondary Distribution Points near the principal diggings (Figures 5.42-5.43).

In 1918, Iditarod was clearly in decline, as business dropped to a third of its 1917 total. By 1920, only about 50 people lived in Iditarod, most of the rest migrating with their businesses (literally, buildings and all) to Flat, which grew relative to Iditarod owing to its proximity to the mines. Rechanneling of the Iditarod River in 1922 prevented direct access to Iditarod by steamers, and it was all but abandoned by the late 1920s (Buzzell and Lewis 1997:10).

Fairbanks became the Judicial Seat of the Third Division of Alaska shortly after Judge James Wickersham decided to move his court here from Eagle in 1903 (Cole 1991:58-59). The Eagle-Fairbanks shift of the Interior Judicial Court occurred not only because of population shifts between these two districts, but also because of a genuine need to place the interior court in a geographically more-central position in Alaska (see Figure 5.1 for locations). Thereafter, Fairbanks became in a sense the "judicial central place" of interior Alaska, let alone for the Fairbanks district which, though small in size, was large in both gold production and population (see Figure 5.22). Fairbanks seated not only the Interior Judicial Division Court, but also the District Attorney's office, the Division's U.S. Marshal's office (with marshal, chief deputy marshal, and deputies marshals), the regional post office through which most interior Alaskan mail would transfer, and a U.S. General Land Office with separate register and receiver. Secondary Distribution settlements north of Fairbanks were provided with Deputy Marshals, Commissioners, and post offices as required by population pressure. As opposed to the Koyukuk district's lineal long-term shifting of centrality upriver through time, the Fairbanks district's geographical extent was relatively quickly understood and utilized, with most placer and lode mining operations restricted to within a ca. 20 mile diameter north of Fairbanks. Figures 5.70-5.74 illustrate the fluctuating nature of the Fairbanks district settlement system over time in this relatively tightly constricted space. While the district as a whole peaked in population and gold output between 1906 and 1909 (see Figure 5.22), one also witnesses rapid growth and decline between the settlements.

Fairbanks's own ascendancy is staggering: by 1903, one year after the initial gold strike, the settlement had grown from a single trading post to a small community containing at least 62 services and businesses, which grew to at least 159 by 1905-06, and 388 by 1907-08 (Cole 1991:13-88; R.L. Polk 1905-06, 1907-08; Tanana Directory Co. 1907). Figure 5.75 illustrates this rapid ascendancy, in relation to select Secondary Distribution Points that developed among the placer creeks to the north. As predicted by the placer gold settlement model (Table 5.11), Fairbanks attained a degree of permanence that has lasted to the present day, relative to surrounding satellite towns, owing to its supply role not only to the Fairbanks district but also much of interior Alaska, and also by attaining the judicial infrastructure for interior Alaska. As time and gold production fluctuated, however, other secondary distribution towns were not so lucky. Figure 5.76 focuses upon the larger of these towns, where all except Chatanika peaked by 1907-08 (Figure 5.72). By 1911-12, however, population had shrunk low enough in Gilmore and Vault that their post offices had closed, as did Dome's by 1915-16 (Ricks 1965). And while Cleary still retained its post office at this date, it had lost much of its population and associated services following a disastrous 1907 fire when many people chose to rebuild in newly-established Chatanika, itself situated at the terminus of the Tanana Valley Railway

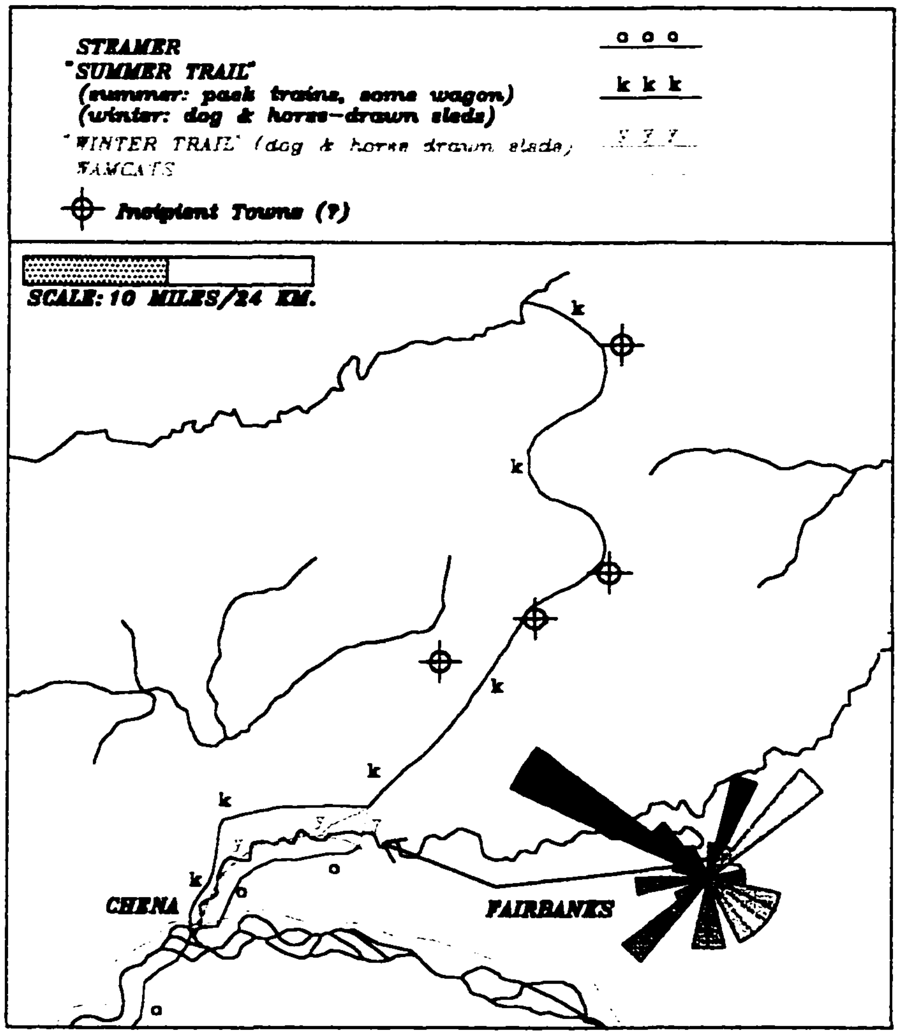


Figure 5.70 Transportation and settlement system, Fairbanks area (ca. 1903). Note early trail system, incipient secondary distribution points, and competing central distribution centers only one year after initial discovery. (Source: Cole 1991:43).

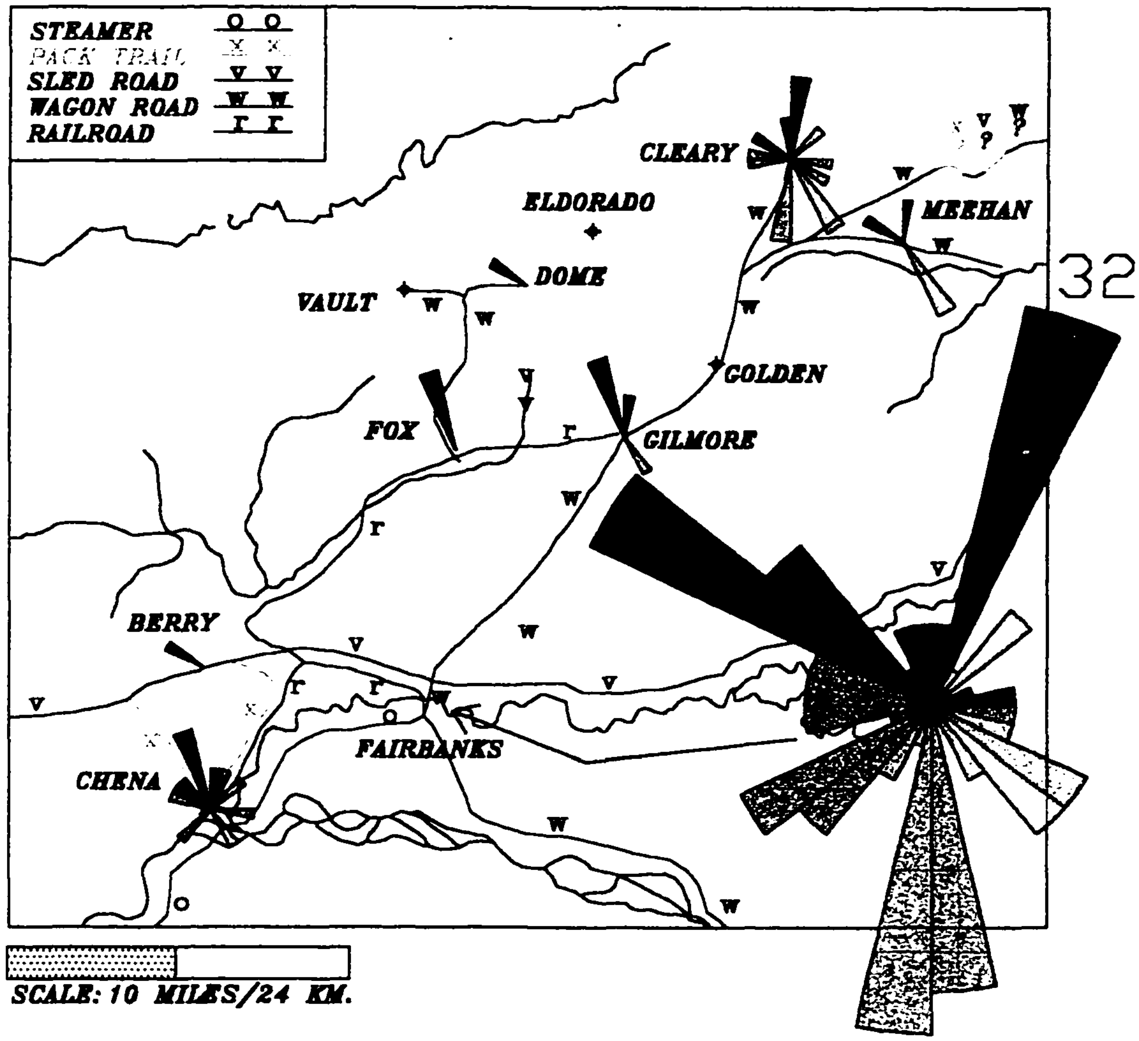


Figure 5.71 Transportation and settlement system, Fairbanks area (ca. 1906). Note growth of Fairbanks, founding of secondary distribution points closer to diggings, all-season wagon roads, and private railroad connecting Chena and Fairbanks to Gilmore.

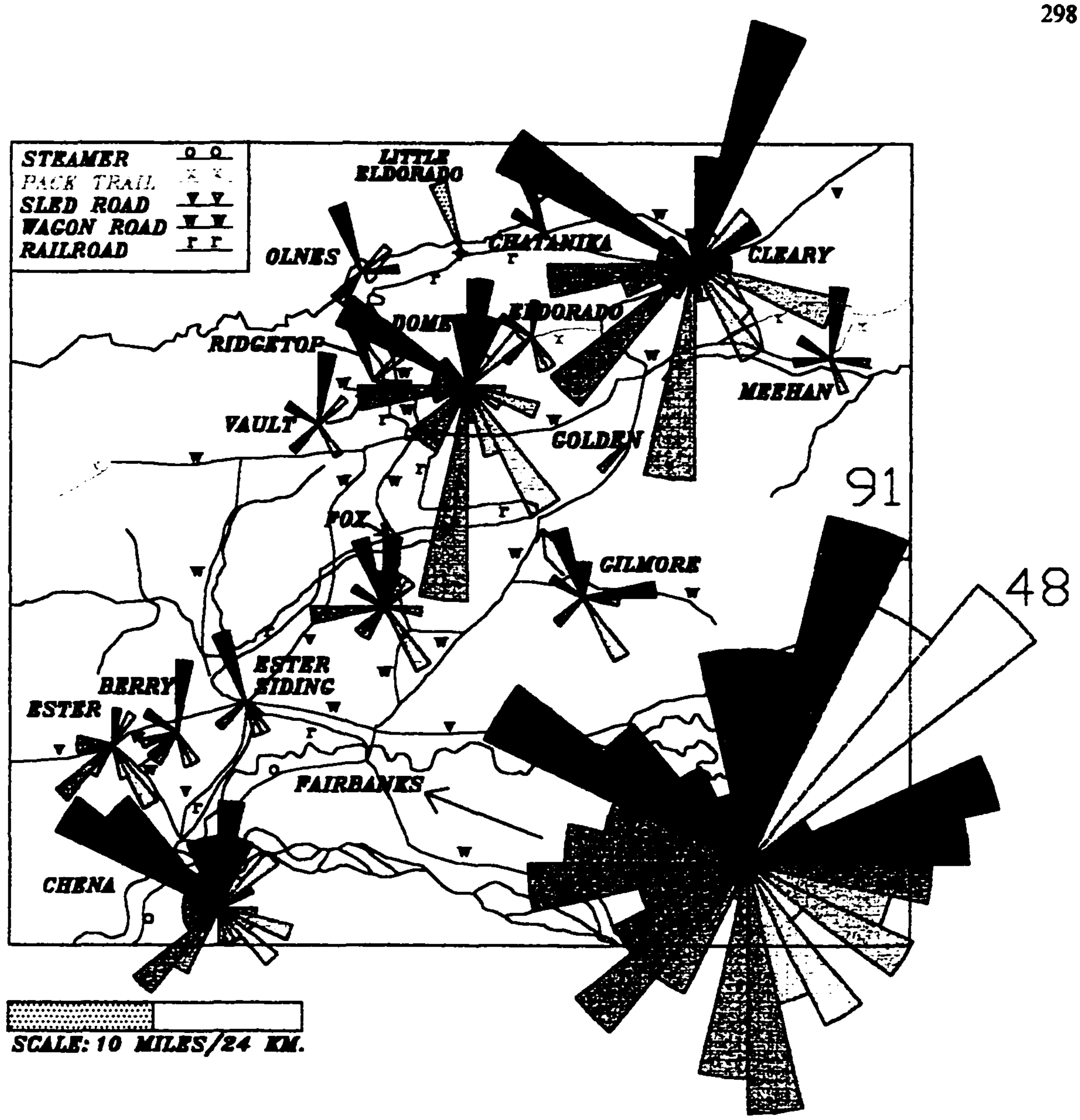


Figure 5.72 Transportation and settlement system, Fairbanks area (ca. 1908). Note extension of railroad to chatanika and explosiver growth of both secondary distribution points and the all-season wagon road system during these peak gold production years dominated by labor-intensive and non-large scale nor capital intensive mining techniques.

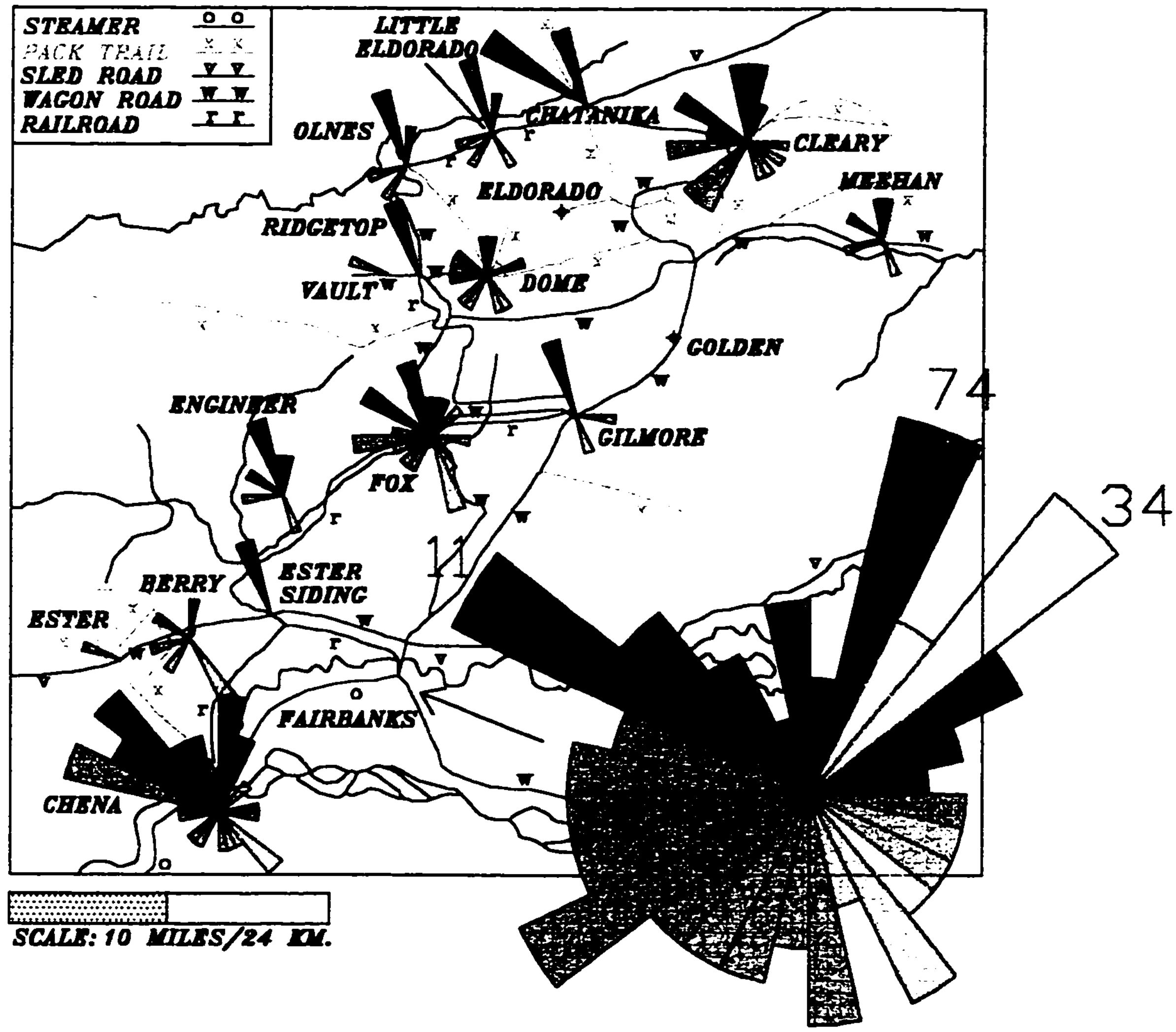


Figure 5.73 Transportation and settlement system, Fairbanks area (ca. 1912). Note decline of the secondary distribution points during these early post-1909, i.e., post-"bonanza," years.

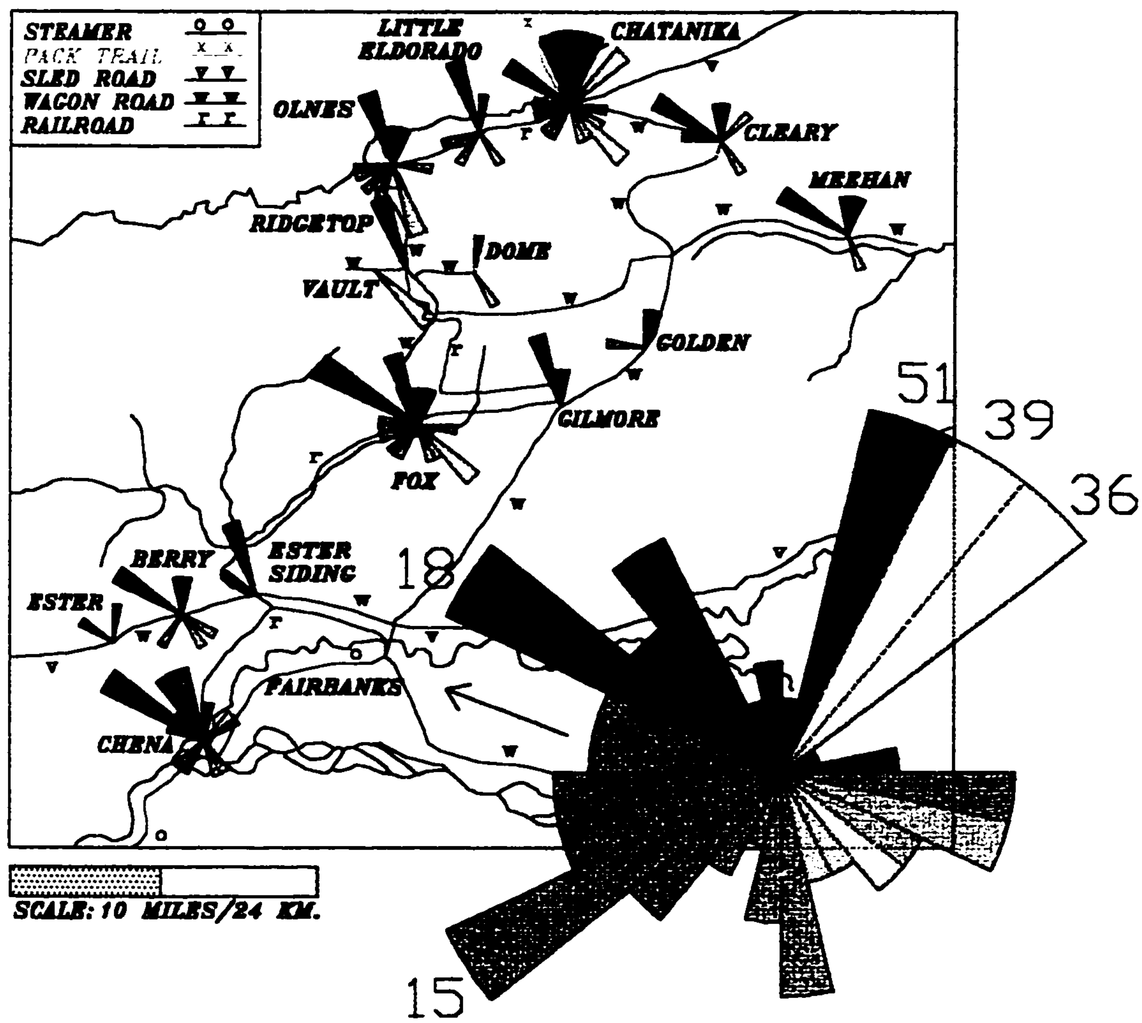


Figure 5.74 Transportation and settlement system, Fairbanks area (ca. 1916). Note continued decline of most secondary distribution points leading up to World War I.

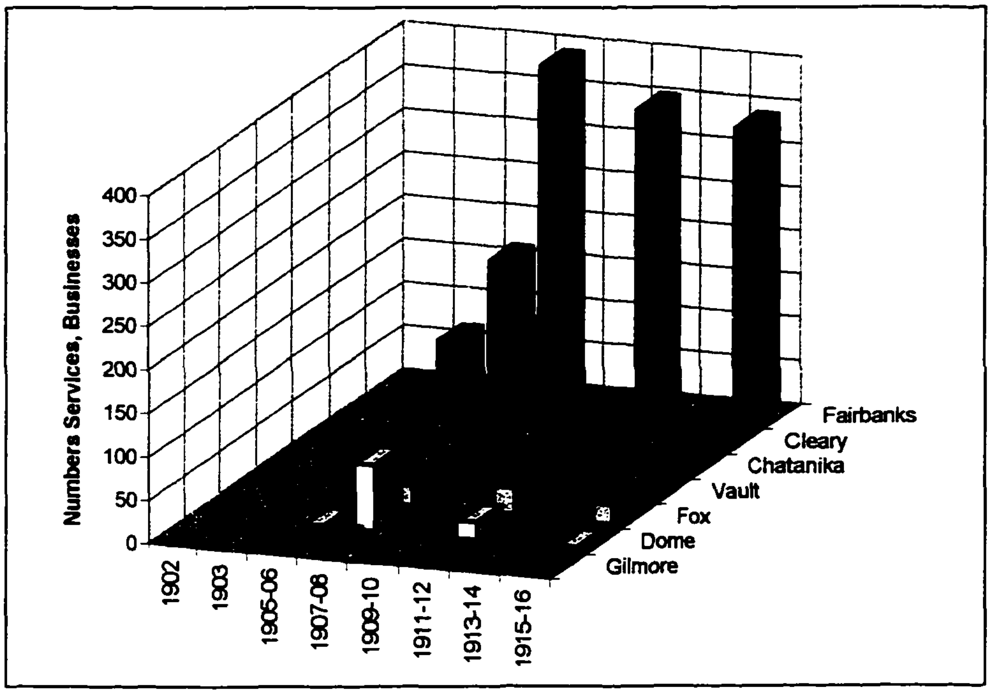


Figure 5.75 Fairbanks versus select secondary distribution points in the Fairbanks mining district, 1902-1916. Note rise and decline of secondary towns through time, but permanence of Fairbanks, the central distribution center.

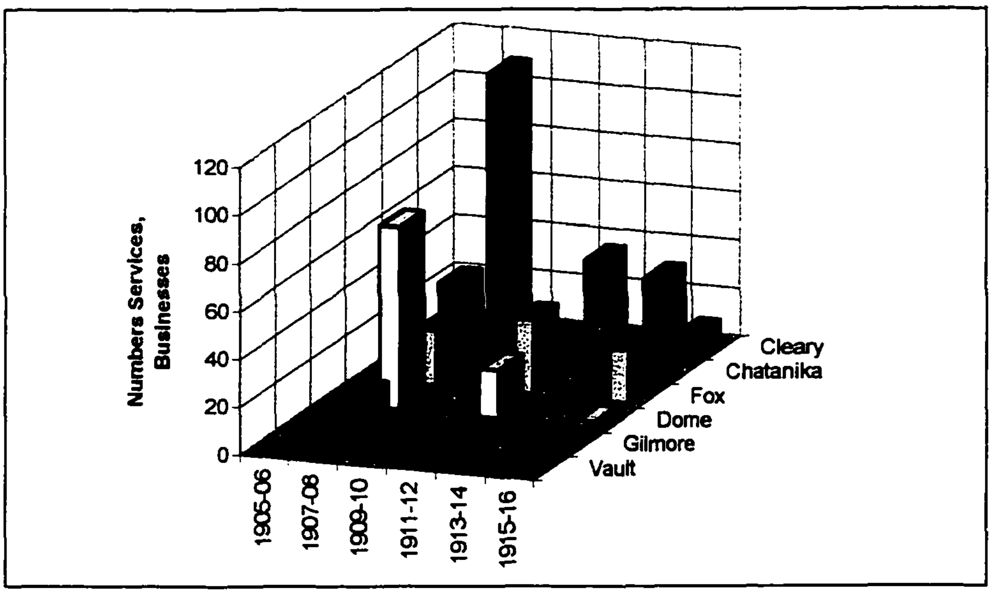


Figure 5.76 Major secondary distribution points in the Fairbanks district, 1905-16. Note general decline post-1907, and rise of Chatanika following the decline of nearby Cleary.

(which reached this point by September 1907; Deeley 1996:58). While Chatanika data is sketchy, one can still witness its rapid growth as others decline (see Figure 5.74).

The second aspect of the hypothesis, discussed below, is re-iterated: activities typical of a higher settlement level (or tier) shift down (or up) a tier in direct relation to an increase (or decrease) in population. This is a simple mechanism of supply and demand. Relative to a placer mining settlement system, we hypothesize that the richer and/or more extensive the "paystreak" is, the more miners will be supported, thus the more services will develop to supply and service the miners closer and closer to the actual mines. In our placer mining hierarchy model, this would equate to the development of Secondary Distribution Points (the fourth settlement tier; see Table 5.11), as existing towns increase both number and variety of services relative to surrounding population numbers, and/or entirely new settlements are founded. The development of this fourth tier is also directly dependent upon the construction and maintenance of an effective transportation supply system between these settlements and the associated Central Distribution Center.

The four mining districts examined here fit well to these expectations. Figure 5.77 (see Table 5.14) illustrates the close relationship between population of a district, its gold production, and number of Secondary Distribution Points/towns during the peak production years for each of the four districts examined. The correlations between number of secondary distribution towns and placer gold production (red dots, red line), and population level and number of secondary distribution towns (blue dots, blue line) indicate a very close correlation, with R_2 values of .98 each. Thus, as population increases from district to district across space, more Secondary Distribution Points closer to the actual placer gold creeks are established, in direct proportion to the worth of that part of the district. Correspondingly, the number of miles of good overland transportation routes (e.g., "wagon roads") increases or decreases proportionately (compare Figure 5.72 to 5.68 and 5.60). As instigated earlier, there is a direct correlation between building and maintenance of effective and efficient (overland) transportation and the establishment of Secondary Distribution Points beyond the Central Distribution Center.

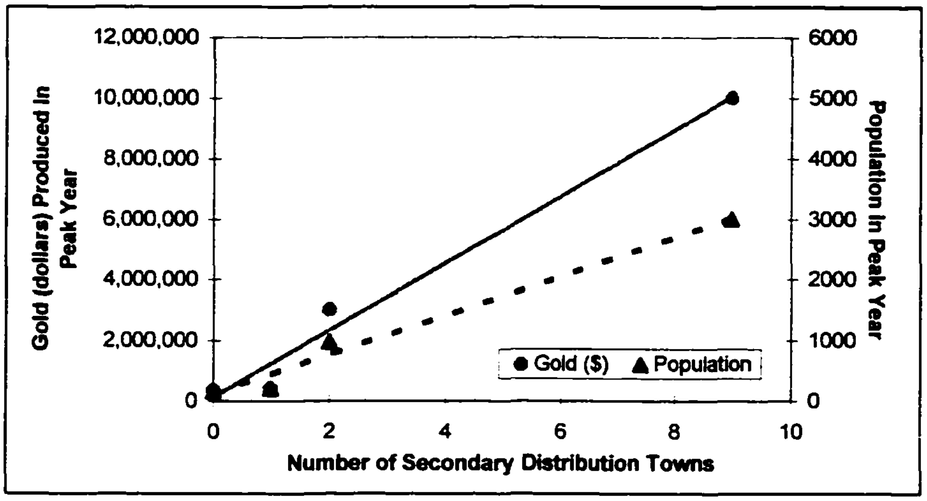


Figure 5.77 Gold production, population, and number of secondary distribution towns during peak year of production for the (left to right) Innoko, Koyukuk, Iditarod, and Fairbanks mining districts. Note the high correlation among population and number of towns, and peak gold production and number of towns.

Table 5.14 Gold production, mining population, and number of secondary distribution towns in peak years. See Figure 5.77. (Sources: Brooks 1905-25, Martin 1918-20, Moffitt 1927).

	No. Secondary Distribution Points	Population	Gold ($)	Peak Years
Fairbanks District*	9	3000	10,000,000	1908-09
Iditarod District	2	975	3,000,000	1911-12
Koyukuk District	1	200	400,000	1908-09
Innoko District	0	150	350,000	1909-10

*The number of secondary distribution towns chosen for the Fairbanks district were those that had post offices.

Evaluation Of Expectation #5, Development And Internal Dynamics Of Central And Secondary Distribution Settlements, And Extraction Camps

Again, this expectation predicts that, first, a rapid establishment and build up of population, number of commercial establishments, numbers of tradesmen, municipal governments, and social institutions (e.g., schools, churches, theaters) should occur at settlements performing a "central" supply function, that is, at Central Distribution Centers and any associated Secondary Distribution Points.

Second, these settlements should also have a proliferation of specialized retail and service outlets, male-oriented personal and social services reflecting a mobile population (laundromats; saloons; rooms for rent; restaurants; etc.), as well as inordinate numbers of union, public, and secret society lodges and halls.

Third, Central Distribution Centers's layout will be patterned as an organized, well-planned gridiron. Whether this was planned before, during, or after initial site development will in part be a function of time (i.e., 1850s through 1900s). It is expected that late-nineteenth and early-twentieth century Alaska mining town sites should be platted before or during initial development. Whether or not a town deviates from such plans will owe in part to exacerbating physical topography, and/or the non-arrival of the anticipated "rush" of miners and merchants to the futuristic town site. Secondary Distribution Points, without the large population base of the Center, will likely develop either (a) a linear layout pattern (regardless of initial planning) along the associated transportation route or converging routes, or else (b) a less-developed grid, depending upon vagaries of population shifts.

And fourth, Extraction Camps will comprise one (or a few) domestic structures, as well as any associated structures or features related to the resource extraction and collection procedure (shafts, gin poles, dams, sluices, open pits, etc.). Although this settlement type is the most numerous in the hierarchy owing in part to the high mobility of the population, many such camps will nonetheless be destroyed by subsequent mining practices, which typically operate at larger capacities and spatial expanses in order to extract lower and lower grades of pay.

The rapid growth of Alaskan placer-related settlements has been amply demonstrated above. Figures 5.21-5.24 illustrate the rapid initial explosion in population that accompanied the founding of the four investigated mining districts. Numerous other figures (Figures 5.34-5.44, 5.55-5.74) focused on the settlements themselves, principally the numbers of services and businesses that were established in the towns through time. Through these the rapid build up mining settlements, especially Central Distribution Centers and Secondary Distribution Points, has been demonstrated for interior Alaskan placer gold districts (see Expectations above, especially Expectation #2).

For this study, twenty-eight separate services and business types were distinguished for a settlement (see Figure 5.78 for breakdown and color-coding scheme). For the most part, the U.S. Census's economic breakdown was followed, namely, retail, manufacturing, wholesale, transportation, and various other types of services. Several additional categories were created, and existing categories divided into two or more separate divisions, or "wedges", based upon the present study's literature review of western U.S. mining communities. These include the distinction between edible and non-edible manufactured products (to examine self-sufficiency), the presence of Federal and Alaskan District Offices (to examine settlement hierarchy), distinguishing saloons and so-called "secret societies" (to examine aspects of social and political activity), and dividing transportation into companies providing water-borne, railroads, and other overland (non-railroad) means of transport (to examine nature and degree of geographical integration). Various business directories (Fairbanks Commercial Club 1916; Ferguson 1901; Harrison 1908; R L. Polk & Co. 1901, 1901-02, 1903, 1905-06, 1907-08, 1909-10, 1911-12, 1915-16; Tanana Valley Directory 1907), and other sources were consulted for this task (e.g., Anonymous 1912; Anonymous 1916; Davis 1976; Galbraith 1975; Ricks 1965; and various newspapers).

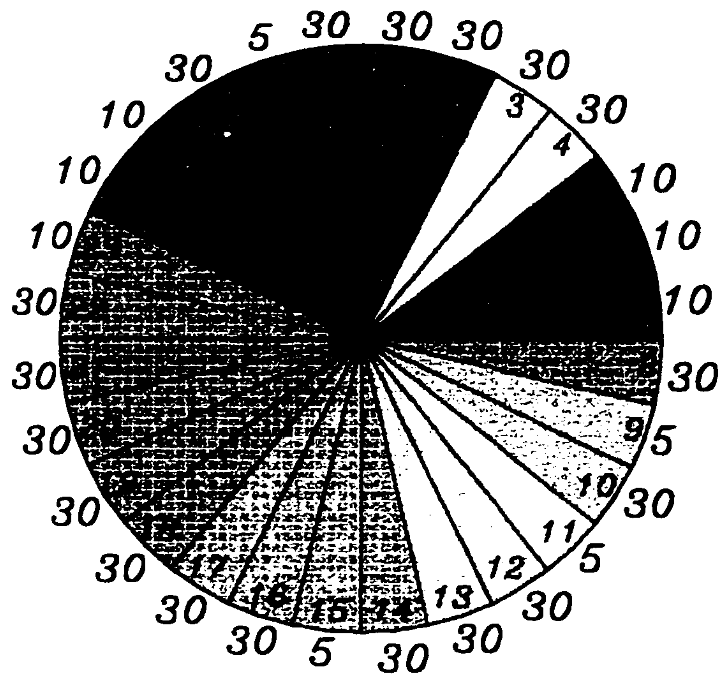


Figure 5.78 Different types of businesses and services tabulated for various mining-related settlements in this study. Numbers outside of each "wedge" indicate the maximum number of that particular service for a complete wedge. Numbers of services less than that total will scale the wedge down in size accordingly; numbers greater than that total will be written in on the appropriate figures. See Figures 5.2–5.7, 5.54–5.62, 5.65–5.69, and 5.70–5.74.

Owing to the archaeological and historical focus given elsewhere in this dissertation to the Upper Koyukuk mining district (Chapters 2 and 3), the in-depth coverage of historical sources has been more thorough for this area relative to the other three districts so far present. The data gathered represent the minimum numbers of each type of service available in the time periods examined. It is not believed that every service or business that existed in the time periods examined has been "discovered" and presented here for each town. A more accurate portrayal would at least require going through all known newspapers for each town, and all city legal, tax, and court papers, a task beyond our present needs. What has to be assumed by this report is that the same degree of oversight has occurred for each settlement, per district examined, thus maintaining the same relative relationships between settlements.

The length of each wedge (see Figures 5.2-5.7, 5.54-5.62, 5.65-5.74) correlates to the number of that service or business present in a mining community. Thus, the length of a wedge twice as long as the same wedge in another settlement has twice as many of that number of businesses. To prevent wedges from growing too large for presentation purposes, a maximum number was allowed for each, and these maximum numbers are found around the outer edge of Figure 5.78. Most of the twenty-eight services/businesses have maximum counts of either thirty or ten. Services with a maximum count of thirty were counted and appropriately scaled in groups of three; that is, counts between one and three received a scaling of three, counts between four and six received a scaling of six, and so on. Services with a maximum count of ten were scaled individually, one through ten. When the maximum number was exceeded (e.g., Fairbanks had at least 91 specialty retail stores in 1907-08), the wedge scaling would stop at the maximum number allowed ("other retail" maximum number = 30), and the actual number of such businesses (n=91) was then written next to that wedge. Exceptions to these rules are found with services not typically found in most towns, and would be few in number even if they were. These are limited to numbers of hospitals, schools, banks, and railroads. In each of these cases, in order to visually present these very important services in their respective towns in the figures, they were scored individually but at twice their value. Thus, one railroad or hospital or bank or school was scaled as if it were two, etc. The size of each wedge (i.e., service or business) in any of the figures given above is scaled the same and directly comparable to any other town visible on that graph.

As predicted by the model (Table 5.11), all of the Central Distribution Centers and many of the Secondary Distribution Points have an early occurrence and continued use of saloons and other forms of male-oriented entertainment (e.g., gambling halls; dance halls; billiards rooms; secret societies; again, see Figure 5.78 for placement of individual services in the wedge diagrams). Minimally, among the winter of 1898-99 stampede occupations on the Koyukuk, (New) Arctic City and Bergman had saloons (Wyman 1988). Bettles had a saloon by *at least* 1901 (Bettles Hotel Register n.d.), Coldfoot had seven saloons and one "gambling locale" by 1902 (Marshall 1991), some of Wiseman's earliest commercial establishments were saloons (Hill 1909), and there were at least two on "Nolan Creek" in 1915 (R.L. Polk 1915-16). In the Innoko and Iditarod districts, Dikeman (founded 1908-09), Dishkakat (Euroamerican presence by 1907), and Ophir (founded 1908) had saloons and/or billiard halls by 1909 (R.L. Polk 1909-10), Innoko City had two during its brief three-month existence in 1908 (Innoko Miner July 16 and 23 1908), as did Iditarod, Discover and Flat by at least 1911 (R.L. Polk 1911-12). Flat, too, had three secret and benevolent male societies by this time, and Iditarod had at least two. And in the Fairbanks district, most Secondary Distribution Points had early reported saloons (see R.L. Polk 1905-06, 1907-08, 1911-12, 1915-16; Tanana Valley directory 1907), including Fox, Vault, Eldorado, Gilmore, Olnes, Ester, Berry, Cleary, and Dome by *at least* 1907. Other overt forms of entertainment include two dance halls and one secret and benevolent society in Cleary (the latter of which had a hall with a seating capacity of 500), an "amusement hall" in Berry, and two dance halls in Dome, all by 1907. Fairbanks, by virtue of its accepted centrality, had more of these services than any other settlement in the district. In terms of secret and benevolent societies, Fairbanks already had one by 1903, five by 1905, eight by 1911, and 15 (both male and female) by 1915, along with multiple dance halls and billiard halls.

In addition to federal judicial and law enforcement personnel (discussed above), various other services were available only at Central Distribution Centers, and for short durations in the largest Secondary Distribution Points. Banking facilities were few in number in the Alaskan mining towns, limited in our study area to Fairbanks (earliest in 1904, and four banks by 1905), Iditarod (two by 1911), and three branch banks in Cleary in 1907 and one branch and two other local banks in Dome in 1907. These latter two secondary distribution settlements's banks or branches were all of short duration, and all six facilities mentioned were closed by 1911. Churches, too, seem to be restricted to those settlements already mentioned. Fairbanks's first churches was under construction by 1903-04 (Episcopal Church Archives), totaled at least three by 1905, four by 1907, and five by 1911. Iditarod's first church (and associated hospital) began to be constructed in 1910-11 (Episcopal Church Archives). Chena's first church was built by the town's people in 1906 (Episcopal Church Archives). And, as above, only Dome and Cleary (reported in 1907 and 1911, and not thereafter) among all of the Secondary Distribution Points in this report had local-based religious services, both Catholic missions. None of the mining settlements in the Innoko or Koyukuk districts ever had continuous religious services, for any length of time. The closest church built near the Koyukuk gold fields was at Allakakat further down stream on the Koyukuk, built in 1906 (Stuck1916; see Figure 5.1 for location), though the gold creeks were visited periodically by representatives from this Episcopal facility (e.g., Stuck 1905, 1916; Rowe 1908; Hoare 1908). Following this same pattern, we see that shortly after their foundings only Fairbanks (November 1903; Cole 1991:74-75) and Iditarod (May 1911; R.L. Polk 1911-12:256-257) voted for incorporation, thus providing for a mayor and city council, local police department, school board, and sewage and pollution control, paid for by liquor license fees and other forms of taxation.

Brief mention should be made regarding gold mining settlements's general lack of food production, and their overall restricted roles as manufacturers of goods. As demonstrated for Alaska as a whole in Expectation #1, above, mining frontiers like other industrial extractive frontiers were heavily dependent upon imported foodstuffs and finished manufactured goods. Interior Alaska's mining frontier was no exception. Without exception, the local food production was minimal in scale, and centered all but exclusively at the larger Central Distribution Centers. The only "food manufacture" at non-Central Distribution Centers were bakers, which were often associated with restaurants, and found at the larger Secondary Distribution Points, including Cleary, Dome, Ester, Fox (as well as Chena) all by at least 1907, as well as Innoko City (in 1908) and Simel City (in 1907) in the Innoko district. The only Koyukuk settlement with any mention of food manufacture is a bakery/restaurant in Bettles by 1901.

It should be mentioned that many miners and towns people supplemented not only their own tables, along with their pocketbooks, with gardens in all of the districts discussed here, but are not tabulated above owing to their supplementary character; i.e., such enterprises did not form the main economical enterprise of the people involved. Likewise with hunters of wild game such as moose and caribou, although there apparently were some professional market hunters that supplied early Fairbanks with wild meat (O'Brien n.d.), this economic aspect is presently not well-understood. Of all of the settlements thus far discussed, only the Central Distribution Centers of Iditarod and especially Fairbanks had economic businesses related to food production beyond that of bakeries. Local food production here includes surrounding field agricultural pursuits as well as market gardeners and greenhouses (by 1907, though likely earlier), numerous bakers/bakeries, water (1903) and beer and soda water brewing and/or bottling plants (by 1907), candy manufacturers (by 1905), poultry breeders/ranches (by 1907), dairies (by 1907), livestock dealers/breeders (by 1907), packers/canners of meat (by 1907), and ice cream manufacture (by 1915). By 1911 Iditarod had a poultry dealer, a soda works, market gardeners, and one undefined "herder."

Without exception, all non-edible manufactures in interior Alaskan mining settlements, as with the limited food production above, were for local use and consumption only (excepting the minerals industry, obviously). Most sizable Secondary Distribution Points and local transfer points in the Fairbanks district early had at least one or two saw mills/ lumber companies, along with Bergman (by 1899), Bettles (by 1899), and Coldfoot (by 1901) in the Koyukuk district, and Dishkakat (by 1909), Innoko City (1908), Flat (by 1911), and Dikeman in the Innoko and Iditarod districts. Many settlements also had advertised carpenters/ builders/ contractors, though most of these in the smaller settlements appear to be one-two man operations that hired extra help as needed. Aside from these two wood-oriented services, other types of manufacturing operations were restricted to the larger central and secondary distribution towns. Iditarod included at minimum furniture and door and sash makers, publishers, boot/ shoemakers, machine shops and metal works, and a boat builder during 1911-16. Early Fairbanks of course had even more variety and quantity, including multiple sheet metal and iron works, various steam, heat, power and electricity plants, sash and door and cabinet and other furniture manufacturers, carriage/ wagon makers, various publishers and printers, a rubber stamp works, dressmakers and boot/ shoemakers, a flume hose factory, carpenter shops, machine shops and foundries, harness manufacturers, boat builders, and of course various saw mills/ lumber companies. Owing to the early, well-developed, and maintained overland transportation system in the Fairbanks district, such "other" manufacturing amenities too could be found in some of the larger Secondary Distribution Points at various points in time, including Chatanika (shoemaker), Cleary (electric light company, iron works and machine works, flume hose factory, boot/ shoemakers), Dome (dressmakers, sheet metal works), Fox (flume hose factory), Olnes (machine shop), as well as Chena (iron works, light and power company). Such businesses were more restricted in the Iditarod, Innoko, and Koyukuk districts, with their less well-developed transportation systems and smaller populations, although Dikeman had a couple of iron works, and Wiseman had a tin shop.

Similar to the above patterns, wholesalers of manufactured goods were restricted to the Fairbanks district largest settlements and to Iditarod City, apparently with population pressure never great enough in the Koyukuk and Innoko districts to warrant their establishment. Iditarod had three liquor and one grocer wholesalers by 1911, Cleary had one meat wholesaler and one grocer wholesaler in 1907, and Chena had two grocer wholesalers and one liquor wholesaler in 1907. In strong contrast, Fairbanks had 27 separate businesses that provided wholesale goods by 1907, including those in grocers, cigars/ tobacco, clothing, hardware, candy and confections, and meats. No other merchant wholesalers are presented in the sources listed above.

Lastly, as for site spatial layout, Stuck (1917:346) reports that an official from the General Land Office laid out a town site at Peavey in ca. 1898-99, with a church, school, and courthouse, with multiple numbered avenues and streets, most of which never materialized (the schoolhouse was built and photographed in fall 1899; Schrader 1900: Plate LXIIB). Likewise, a speculator platted Coldfoot in 1902 with numerous streets and avenues (Figure 5.79), few of which actually appeared. Although sales records exist that clearly indicate the purchase and sale or specific lots of land at Coldfoot (c.f., Fairbanks District Recorder's Office), little actually remains on the ground to indicate an orderly arrangement of streets and structures. Figure 5.80 illustrates the arrangement of foundation remains presently located in the old town site. Early photographs of Coldfoot (Anonymous 1908:81, Stuck 1916:37; George Lounsbury n.d., photo of Coldfoot dated 1902) taken at ground level are inconclusive regarding the presence of a well-laid street plan. These data are consistent with the model developed for placer gold mining settlements (Table 5.11), outlined above, that of a large speculative town site platted with the hopes of subsequent or continued population growth.

Fairbanks tried to follow a gridlike pattern from its inception, growing away from Barnette's original trading post. However, two things prevented the formation of a perfect gridlike pattern at Fairbanks, as is seen in Figures 4.9-4.11 for other Western mining towns: (1) the repeated meanders of the Chena River, and (2) the practice of aligning the

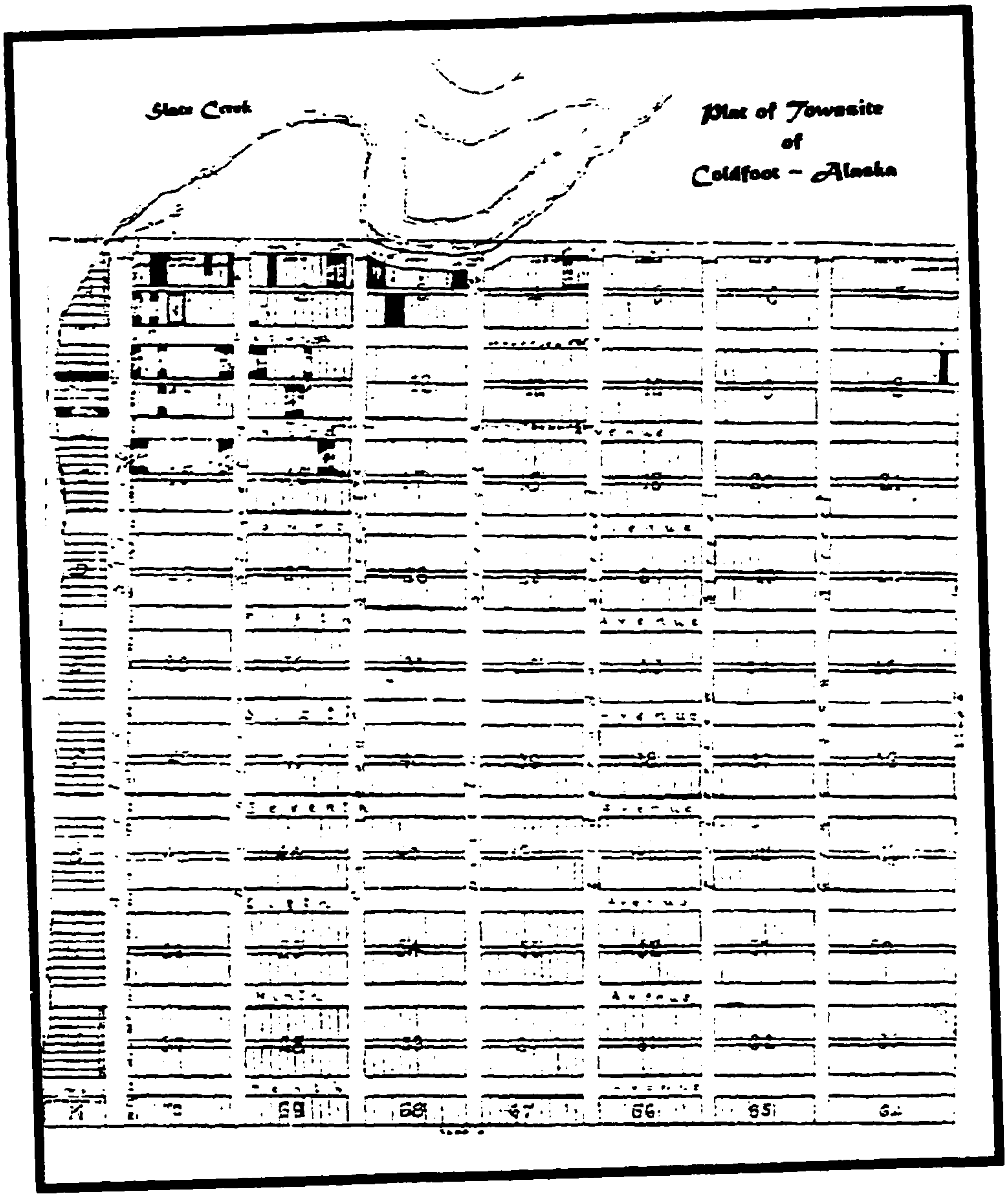


Figure 5.79 Plan of Coldfoot. Alaska. filed May 31. 1901. (Source: Will n. d.: Figure 3).

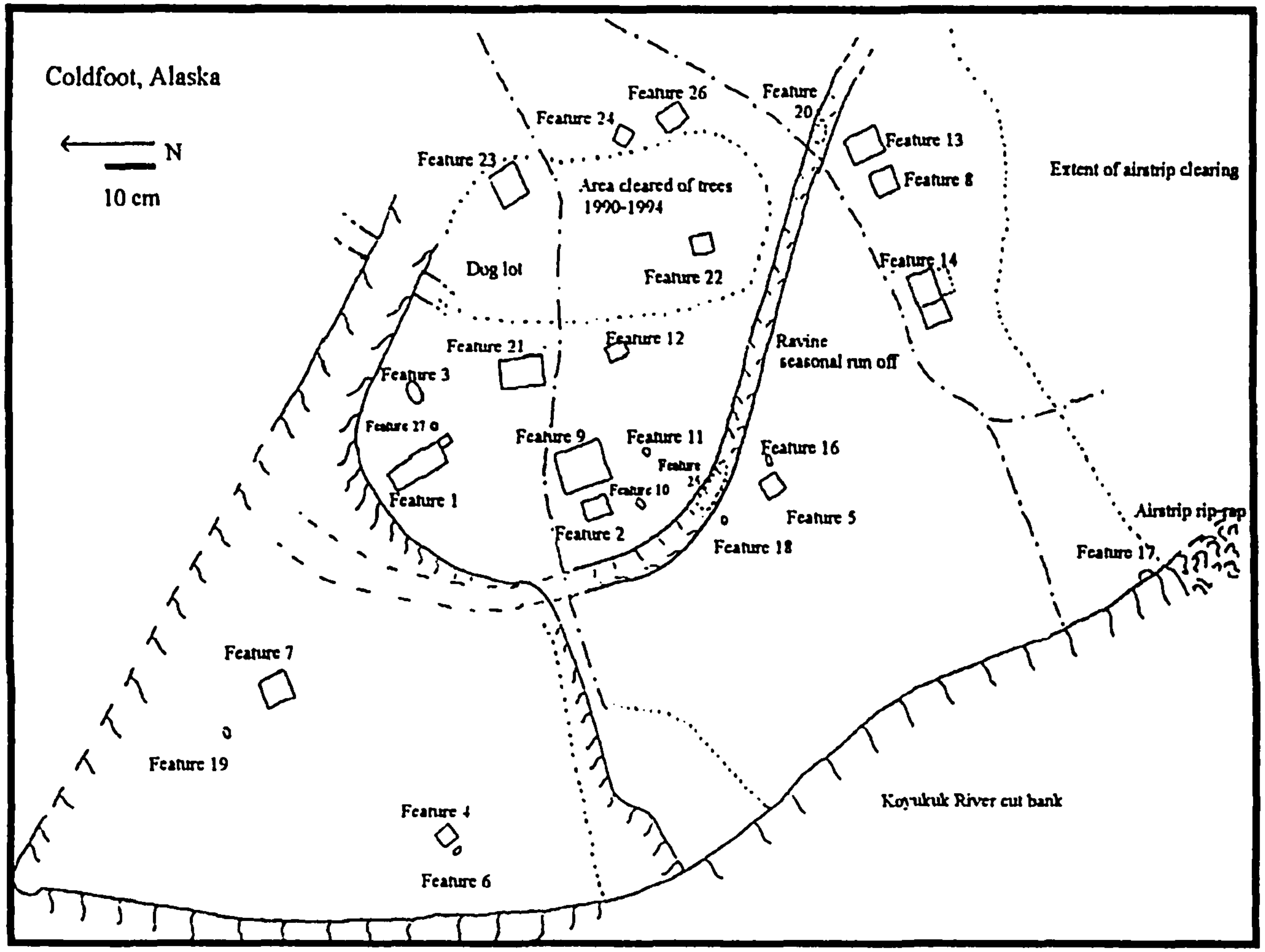


Figure 5.80 Coldfoot (WIS-007) site map; including all surficial cultural and natural features.

river-side town lots facing the Chena. As a result. the first dozen or so streets and avenues are not altogether parallel and perpendicular to each, which produced problems when laying out the town site lots. As a result, these first blocks and lots alongside the Chena are a patchwork of assorted sizes and shapes, produced as a result of trying to conform to two standard practices of the day: paralleling the main series of economic enterprises parallel to and fronting the main route of transportation, and trying to establish and maintain a gridlike pattern.

Unfortunately, no systematic archaeological surveys have yet taken place for the smaller satellite settlements north of Fairbanks, those that survived subsequent destruction by later mining ventures. Nor has there been a thorough documentary search for city plats for any of these areas. Of the Iditarod district, only Flat has been surveyed and published. In 1993, Flat was surveyed (Buzzell and Lewis 1997; Buzzell 1997), but most of what remains on the old town site dates to or after the 1920s, owing to the fact that most of the town site has been dredged since that time. Early photographs of Flat, though, indicate a town with two streets in depth, paralleling a meander of Otter Creek (Buzzell and Lewis 1997:6-8). The town of Discovery has been destroyed by dredging operations (Buzzell and Lewis 1997:9). As expected, the Central Distribution Center of Iditarod was described in 1911, one year after its founding, as being the "metropolis of Alaska's newest placer country," with a population of 500 and being "laid out in blocks and streets" (R.L. Polk & Co.:256-57). What remains of the Iditarod town site was also surveyed in 1993, and although numerous of its structures are reported to have been moved to Flat during the latter's ascendancy over the former in the 1920s, many of the streets and out-going roads and tram routes still reflect a grid-like layout (Buzzell 1997:256, Figure 62).

Evaluation of Expectation #6, A Resource-Based Settlement and Transportation Pattern

Again this expectation predicts that, first, production and processing technology, population, and hence settlement pattern will be located specifically where "patches" of resources, or mining districts, are located. The resulting frontier-wide settlement and transportation pattern will be non-dendritic (cf. Lewis 1984:21-22), that is, not branching further and further outward/ inland slowly through time from a coastal Entrepot or supply town. While expansion of the settlement system throughout the placer mining frontier through time obviously is expected, this occurs only in a broad manner (initially coastal, then interior along major transportation arteries (e.g., rivers), then along smaller tributaries). Expansion will occur neither evenly nor continuously away from the Entrepot, as is expected in an insular agricultural settlement frontier with a more-evenly distributed resource base (i.e., arable land).

Second, the frontier placer mining pattern instead should be a quick build up in otherwise undeveloped "isolated" areas; the build up should be relatively rapid (months, 1-2 years) in terms of population, town build up and diversification (see above), as well as quick development of transport links between settlement nodes within the patch. Such isolated patches of concentrated urbanization will be connected via lengthy (if not tenuous) transportation lines through areas of low population/development.

And third, transportation should take advantage, at least during initial build up of a region, of pre-existing routes (e.g., notably navigable rivers and streams) where and whenever possible; however, any links in this system that are deemed too costly in terms of effort or time will rapidly be replaced by more expensive yet ultimately cost-effective point-to-point transportation routes, typically by means of outside capital.

Much of this should already be apparent for Alaska, as inferred from discussions in the other hypotheses, presented above. Relative to Lewis's (1984) insular agricultural model, with its transportation and settlement systems resembling a "dendritic" slow, even, continual branching outward and inland from a coastal Entrepot with (initially) relatively little inland settlement inter-connection, the Alaskan placer gold mining scenario is easily distinguished. While many of Alaska's coastal transfer points, particularly in the perennially ice-free Gulf of Alaska, attained relatively rapid, populated, well-developed (i.e., diversity and quantity of political, economic, social and religious services and businesses), and long-lasting settlements (see Anchorage, Cordova, Seward, Skagway, Valdez, on Figures 5.2-5.7), none attained Entrepot-size status (Siddall 1955:12-13). The case is highlighted by the fact that during the American era, both district or territorial political "capitals" of Alaska, Sitka and Juneau in Southeast Alaska, were and remain to this day unconnected by overland transport to the rest of the state. Until completion of the Alaska Railroad in 1923, connecting Seward to Anchorage to Fairbanks, the Yukon River served as the main supply artery into interior Alaska since gold interest during the American era began in the 1870s. And while St. Michael, founded during the previous Russian period near the mouth of the Yukon, increased dramatically in size because of the gold rushes, it never rivaled any of the larger mining or transfer centers in terms of population, political, or economic influence. It would remain a critical transfer point between ocean and river-bound transport into interior Alaska until this role was supplanted by the Alaska Railroad. Table 5.15 traces St. Michael's population from the Russian era through to the 1950 U.S. Census, which reflects these critical economic shifts.

As opposed to branching outward from a single locale, discoveries of placer gold in non-Southeast Alaska correlate less with distance inland and more with river access. Alaska's (and adjacent Yukon Territory's) initial major placer gold rushes occurred more

Table 5.15 Changing population of St. Michael, 1860-1950. Located near the mouth of the Yukon River and major intermediate transfer point for ocean vessels bearing supplies for interior Alaska. Note the dramatic increase in population after the 1896 Klondike strike, and the slump after the 1923 completion of the Alaska Railroad. (Source: Siddall 1955:Figure 2, p.18).

Year	Population		Year	Population
1860	146		1910	415
1870			1920	371
1880	109		1929	147
1890	101		1939	142
1900	857		1950	157

than a thousand river miles from St. Michael on small feeder creeks of the upper Yukon River (Alaska's Fortymile district, 1880s; Yukon's Klondike, mid-late 1896-97), then on feeder creeks to the Middle Yukon (Rampart district, 1894-96), then subsequently on the Seward Peninsula 1898-99 immediately north of St. Michael, then along major tributaries of the Middle Yukon (Koyukuk district 1899-1900; Fairbanks district 1902-03; Chandalar district 1906-07), and then along tributaries of the Lower Yukon (Innoko district 1907-08; Iditarod district 1909-10). Subsequent though smaller rushes continued to occur throughout Alaska (e.g., Ruby 1907, 1911; Poorman 1913; Chisana 1913; Tolovana 1914; Livengood 1914; see Figure 5.1 for locations). Figures 5.81a-5.81c trace this Alaskan-wide gold placer development through time, by plotting the founding of central and secondary distribution settlements in Alaska from before 1895 through 1914. The figures represent only the establishment of settlements, not their duration or demise. These data stand in contrast to the spatio-temporal establishment of agricultural communities, as presented in Lewis's insular frontier model, expanding neither continuously and gradually away from any coastal settlement (let alone a non-existing coastal Entrepot). These data also illustrate the "patchy" resource-based settlement pattern typical of industrial frontiers.

Figures 5.2-5.7 trace the development of Alaska's overland transportation system by the federally-organized and Army-run Alaska Road Commission from 1905 (its first fiscal year) through 1916, after the last significant gold rush to Tolovana and Livengood in 1914. The ARC developed a tri-partite scale of trail and road categories (ARC 1906-1917). The first category in this transportation hierarchy was the winter dog-sled and summer pack trails, which generally entailed clearing a brush-free right-of-way and possibly the erection of sizable tri-pods to guide the way through areas of low or no relief and where there was a potential for high snow fall. The building of shelter cabins along more isolated routes, and small bridges or tram systems over streams and rivers along these routes were determined by a case-by-case review. Owing to the establishment of such trails sometimes over or through marshy, tundra, or other wet terrain, these systems might be applicable only for winter use.

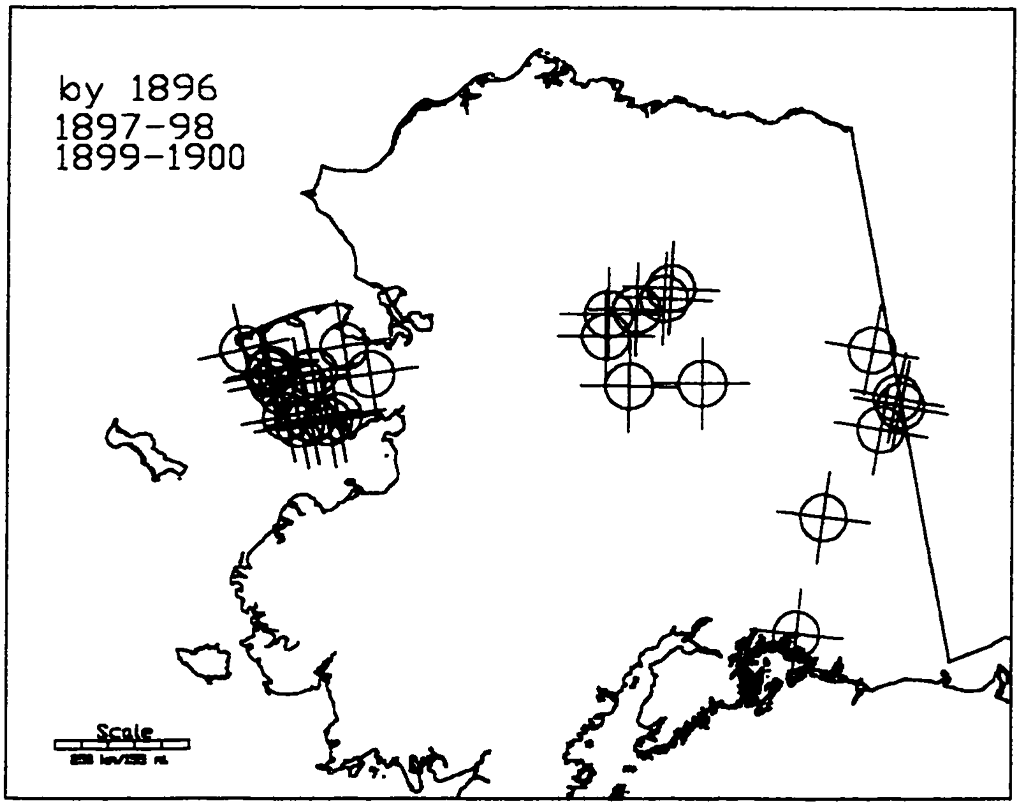


Figure 5.81a Placer gold mining-related settlements founded prior to 1896, and during 1897-1900. Note clustered nature of settlements, and non-slow growth inland from an initial coastal settlement. (Source: Orth 1967 and others).

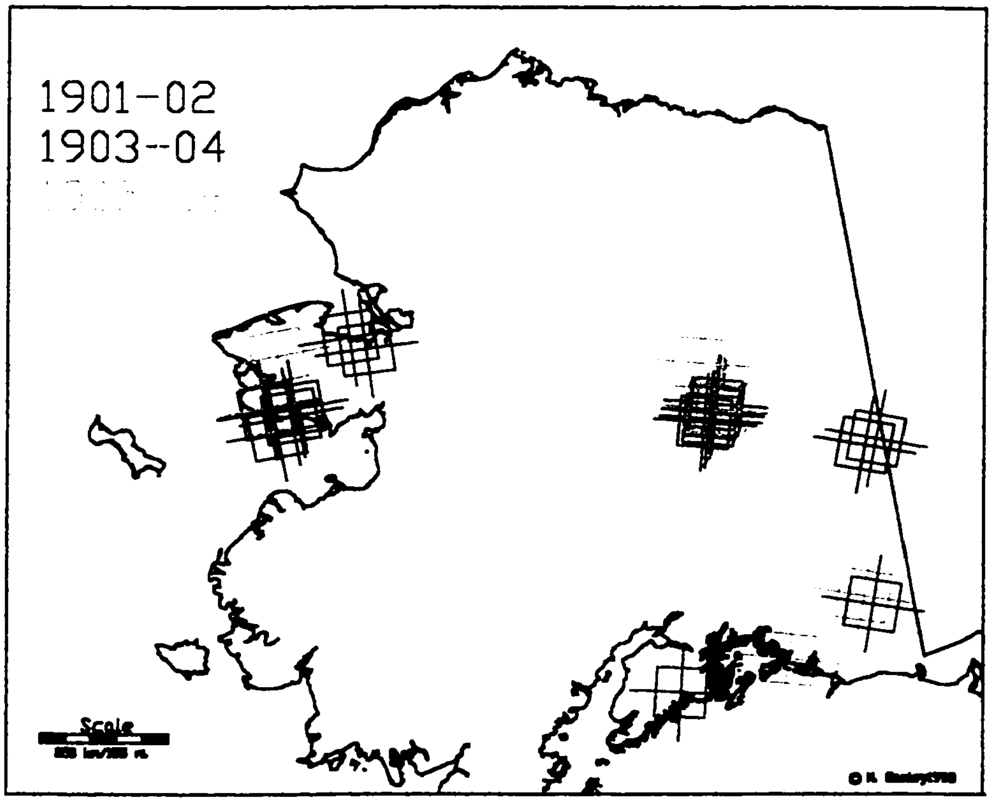


Figure 5.81b Placer gold mining-related settlements founded between ca. 1901-06. Note clustered nature of settlements and non-slow growth inland from an initial coastal settlement. (Source: Orth 1967 and others).

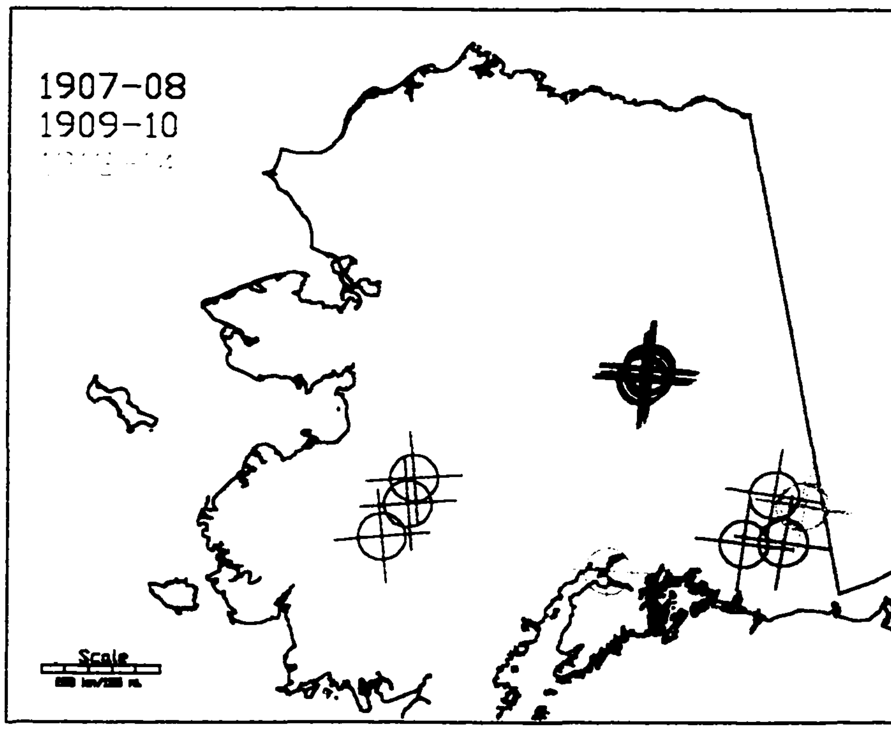


Figure 5.81c Placer gold mining-related settlements founded between ca. 1907-14. Note clustered nature of settlements and non-slow growth inland from an initial coastal settlement. (Source: Orth 1967 and others).

The next level were the winter sled roads, with such routes cleared and maintained wide enough to allow the passage of large passenger and freight winter sleds pulled by teams of horses. Ground would need to be leveled where necessary, bridges erected, and trees and other vegetation cleared. Summer travel along these routes typically varied with the season, with use restricted or entirely curtailed during spring breakup and other wet times, and use as a pack trail and even wagon road during drier times of the year. The last level, wagon roads, was meant to be usable by horse-drawn wagons and later automobiles all year long. Owing to the widespread occurrence of permafrost across much of interior Alaska, the ARC quickly learned to lay down a bed of small trees and build upon these a gravel and earthen road bed. This was largely successful in preventing the infamous melting of permafrost along and underneath utilized routes and trails, which could quickly result in muddy impassable quagmires for people, vehicles, and draft animals. Representatives of the newly formed Alaska Road Commission (ARC 1905:13) describe the deplorable conditions of such unmaintained roads north of Fairbanks when they arrived during the summer of 1905 to assess its transportation needs.

Figures 5.2-5.7 trace the development of the Alaska Road Commission's overland transportation system between 1905-16, not only in the four districts we are currently examining, but throughout Alaska. These figures clearly demonstrate the "patchy" or resource-based nature of interior Alaska's frontier placer gold mining settlement and transportation system. The sole exception is seen with Nome on the southern coast of the Seward Peninsula, where most developed trails, roads, and railways centered upon and fed towards that key Central Distribution Center. While the transportation system might superficially resemble the dendritic nature of the insular agrarian model, the founding of settlements away from it did not (see Figures 5.81a-5.81c). Along with clustering of settlements, the shape of the transportation systems oriented to supplying those settlements likewise are dictated by the patchiness of the resource base. Figures 5.2-5.7 illustrate clearly the non-dendritic transportation system that mirrors the settlement system, discussed above. Lines of transportation reach out great distances across areas of very low population density, connecting high population settlement(s) located at coastal transfer points on the one end and the districts of mineral extraction on the other. One of the principal goals of the Alaska Road Commission was the improvement to "wagon road" status the pre-existing winter dog-sled and summer pack trail that connected Fairbanks to Valdez, the latter of which had an ice-free port all year long, as opposed to the Yukon River route which was open only ca. four months during the summer. Work progressed quickly, with the trail being upgraded to winter sled road quality by 1907, and completely to wagon road quality by 1911-12 (ARC 1906-13).

Likewise, numerous pre-existing winter and summer trails fed into the Upper Koyukuk from all directions during its turn-of-the-century stampedes (see Figure 5.55). Among these, the ARC finally took over responsibility for improving and maintaining two of these routes, the first in ca. 1909-10 (Tanana-Arctic City-Bettles-Coldfoot; Maddren 1913:31; ARC 1910), and the second in 1924 (Caro-Coldfoot; ARC 1925). These routes *never* progressed beyond the dog-sled/ pack trail status, with the vast majority of supplies still reaching the Upper Koyukuk through the late 1920s via horse-drawn scows in the summer, the same method that had been employed for nearly three decades. Similarly, overland routes *into* the Innoko and Iditarod districts, though quickly established and long-maintained, never progressed beyond trail status.

Unlike the singular often lineal nature of the routes to and between districts, efforts and money were instead poured into developing and maintaining a nexus of roads and trails within districts. These have already been demonstrated above for our four districts (see Figures 5.54-5.62 for the Koyukuk; Figures 5.65-5.69 for the Innoko and Iditarod; Figures 5.70-5.74 for Fairbanks). These figures, along with those at the Alaska-wide scale (Figures 5.2-5.7) graphically illustrate the early and rapid development of transportation both within and between mining districts throughout interior Alaska. Again, this stands in contrast to the insular agricultural model presented by Lewis (1984), where initially branching roads connected towards the coastal Entrepot, with interconnecting roads maintained between hinterland settlements appearing later.

Evaluation Of Expectation #7, Transportation Services

Again, this expectation predicts that, first, early placer mining transportation services should exist along transportation routes, and reflect the nature of (a) the goods and services used by that route, (b) the nature of the commodity (bulk, perishability, size) should be reflected in the nature of the settlement system (e.g., locations and presence of activities related to extraction, initial and any further refinement of the product, packaging, and shipping, as well as (c) the physical/environmental limitations of the route relevant to contemporary technology. Settlements and sites will correspond to any Intermediate Transfer Points situated at points in the supply network where change in mode of transportation is required, along with any Intermediate Supply Points, those that service the needs of either a means of transportation or its employees or passengers, located along the lengthy transport routes between concentrations of developed areas.

Second, specific features and activities related to actual mining extraction activities should not be reflected at these transportation-related sites.

Third, Intermediate Transfer Points will exhibit a variable layout pattern, either linear along one route, or "converging" where more than one route intersect. Increases in population in either situation should result in either continued lineal build up along the transportation route, or parallel development away from immediate access to the route. In either of these cases, decisions will likely be guided by context-specific variables, not least of which will be local topography.

And fourth, if more than one structure, Intermediate Supply Points would likely present a cluster (i.e., concentrated, but non-gridded) adjacent to the transportation route.

Placer gold required no additional necessary processing equipment in the mining district or along the transportation routes out of Alaska. While assays determined that different creeks and districts produced different qualities of gold, it was not necessary to further refine the product prior to shipment. Likewise, being a compact, inert, highly durable commodity, gold required no additional packaging, exporting, or storage facilities anywhere along its route between the frontier and the core, although a series of secure holding facilities along the way were highly desirable to deter theft!. Lode gold of course required other facilities, such as stamp mills, amalgamation tables, and other equipment. However, of the four districts examined here, only Fairbanks having a fledgling lode industry during the early twentieth century.

The nature of Alaska's placer mining supply network has already been alluded to above (see Siddall 1955: Part III, pp.1-34). In brief, before the completion of the Alaska Railroad in 1923, there were three principal supply routes into interior Alaska. The first is by river steamers up the Yukon River, by way of St. Michaels. Growing from a single steamer on the river in 1869, owned by the newly formed Alaska Commercial Co. (A.C.C.), the incipient fleet soon grew to seven by 1897, 30-35 by 1899, 47 by 1900, and to as many as 58 by 1902. The number of supply and transportation companies also climbed in response to the gold rushes, starting initially with the aforementioned A.C.C., adding the North American Transportation and Trading Co. (N.A.T.T.C.) in 1891, and the Alaska Exploration Co., Seattle-Yukon Transportation Co., and Empire Transportation Co.s in 1898. These five major players (other smaller companies largely failed) all maintained trading posts and stores in native and Euroamerican settlements throughout Alaska, and operated ocean steamers primarily from Seattle to supply their posts[3]. The other main routes into the interior included the Valdez-Fairbanks wagon road, as discussed above, and the Canadian route which utilized first the White Pass and Yukon Railway (Skagway, Alaska to Whitehorse, YT; completed July 1900), and then steamers via Dawson down the Yukon River. Both of these latter routes however played secondary roles to the principal route up the Yukon via St. Michael.

St. Michael as a principal port settlement left much to be desired. For instance, its harbor is too shallow for large ocean vessels, the closest shelter from Bering Sea storms is ca. 8-10 miles away, exposure to the Bering Sea weather system occurs along a fourteen mile stretch between St. Michael and Stephen's Pass near the mouth of the Yukon, many sand bars exist at the mouth of the Yukon and between Stephen's Pass and the mouth, and there is a shortage in available local fuel. Despite these concerns, St. Michael remained the major trans-shipment point between ocean-going vessels and shallower river steamers (Siddall 1955:15-17). The settlement was described in ca.1899-1901 as being "the most important settlement in Alaska, as it is the port of entry for all vessels bound from the States with passengers and freight for the interior" (Cantwell 1904:5-6). Figure 5.82 and Table 5.16 illustrate the dramatic increase in freight that passed through St. Michael in the years following the Yukon and Alaskan gold rushes.

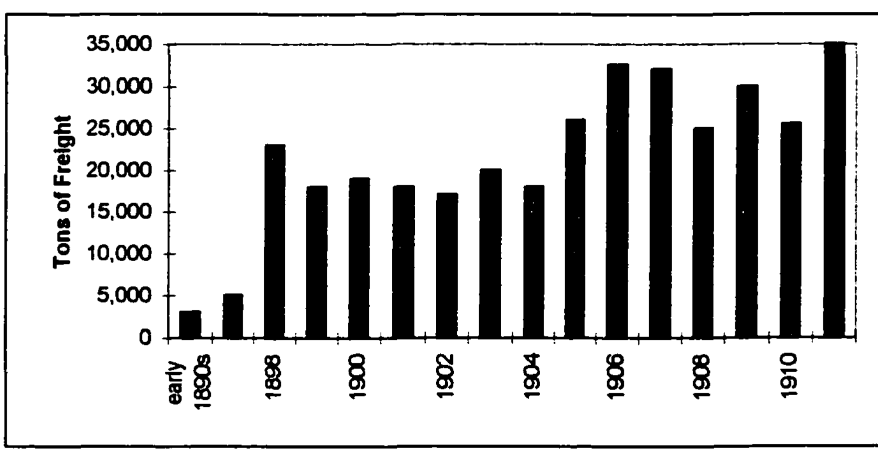


Figure 5.82 Tons of freight up the Yukon river, early 1890s-1911. Note the dramatic increase in freight after the 1896 Klondike strike.

With respect to the four mining district case studies, steamers would ascend from St. Michael up the Yukon, then Tanana River, and finally a few miles up the Chena River to Fairbanks (see Figure 5.1 for river names and locations). If transferred to small enough vessels at St. Michael, such craft might directly ascend the Koyukuk, Innoko, and Iditarod

Table 5.16 Freight in tons shipped per year up the Yukon River, early 1890s-1911. See Figure 5.82. (Source: Gruening 1954:73; Siddall 1955:Part III, Figure 4, p.25).

Year	Freight (tons)		Year	Freight (tons)		Year	Freight (tons)
early 1890s	3,000		1902	17,000		1908	25,000
1897	5,000		1903	20,000		1909	30,000
1898	23,000		1904	18,000		1910	25,500
1899	18,000		1905	26,000		1911	35,000
1900	19,000		1906	32,500			
1901	18,000		1907	32,000			

Rivers to those districts. If not small enough, supplies bound for the Koyukuk district would need to be transferred again at either Koyukuk Station, ca. 5-6 miles down river from the mouth of the Koyukuk, or transferred to smaller ships in Fairbanks, which would then proceed for the Koyukuk. Similarly, if goods were not initially deposited on small enough water craft in St. Michael, much of the cargo ultimately bound for the Innoko and Iditarod districts initially bypassed the mouth of the Innoko on the Lower Yukon and transferred to smaller steamers at Fairbanks, only to come back down river to finish the journey to these two districts (e.g., Brooks 1911-13). Ironically, Fairbanks might be viewed as a transfer point not only for its own mining district, but as a secondary transfer point for the Koyukuk, Innoko, and Iditarod districts, as well! As has already been mentioned, secondary intermediate transfer points located at the acknowledged heads of low-water navigation include Bettles for the Koyukuk district (where goods were transferred from small steamer to horse scows, pole boats, or dog sleds), Dikeman for the Iditarod district, and Dishkakat for the Innoko district (where at low water goods were transferred from small steamers to horse scows or gas/ diesel powered launches).

As expected, a distinguishing characteristic of Intermediate Transfer Points are warehouses, a necessity to temporarily stockpile supplies during the transfer process. This service is represented by one of the 28 service and business "wedges" referred to above (see Figure 5.78 for placement; and Figures 5.54-5.62, 5.65-5.69, 5.70-5.74). As expected, warehouses are limited to coastal and interior Intermediate Transfer Points, as well as large Central Distribution Centers, which too would store goods for the same reasons just mentioned. Following a building boom at the turn-of-the-century owing to the gold rush, ca.1899-1901 St. Michael had "extensive warehouses, stores, hotels, and offices of all the trading companies engaged in business on the Yukon" (Cantwell 1904:111). The N.C. Co. warehouse at Bettles was one of the first buildings constructed at the site (Hegg 1902:10, photograph dates either summer 1899 or summer 1900), storing most of the goods that supplied hundreds of Koyukuk miners for decades. Dikeman had numerous early-reported warehouses (four, plus a warm storage plant; Iditarod Nugget 1910) which, oddly, are not mentioned in subsequent R.L. Polk's Gazetteers (1911-12, 1915-16). Although this apparent "oversight" might result from incomplete recording, it might also result from a change that occurred in transportation further upstream. That is, by 1911 goods are no longer reported as being transshipped further upstream by horse-drawn scows, but instead by small gas launches (Brooks 1912). Perhaps the availability of this newer form of transport greatly affected the turnaround time for goods en route to Iditarod City's warehouses, thus negating the need for extensive warehouses at this transfer point?

Both Chena and Fairbanks had early-built warehouses, wharves, and docks. Many early photographs for Fairbanks center on these facilities, where sections have also been uncovered by recent excavations (Bowers and Gannon 1997), providing valuable architectural and construction detail. Interestingly, a "warehouse" is reported at Dome and Cleary, two of the largest of Fairbanks district's Secondary Distribution Points. The warehouses referred to are associated with the Pacific Cold Storage Co., a company present in numerous Alaskan towns at this time. The company likely stored among other things ice and meats, and might be viewed as another example of a service normally available at a higher settlement tier (i.e., Fairbanks, Central Distribution Center) but which "moved down" to lower tiers owing to population demand. A "warehouse/ machine shop" reported in Olnes might be related to railway repairs and storage. The two warehouses reported in Gilmore in the 1907 Polk's Gazetteer might be related to the town's 1905 and 1907 terminal position at the end of the narrow-gauge Tanana Mines Railway. During the summer and fall of 1907, however, this line was extended to Chatanika. Coincidentally or not, the Gilmore warehouses do not appear in subsequent Polk's publications (e.g., 1909-10, 1911-12, 1915-16). Lastly, no separate warehouse facilities have been reported for either Dishkakat and Ophir in the Innoko District, or Coldfoot and Wiseman in the Koyukuk district. While this again may be an oversight of reporting, the possibility remains that the multiple general stores in each of the these settlements during these years had enough internal inventory storage space to supply the needs of their small districts.

Along with these Intermediate Transfer Points's river steamboats, poling boats, horse-drawn scows, and gasoline powered launches, other means typical of the interior Alaskan mining transportation system include tramways to carry goods and personnel across streams, railways and associated sidings (all privately owned and built prior to the federal government's 1914 entry into this market; see Figures 5.2-5.7), wood chopping areas along the rivers and streams to fuel the insatiable demand by steamers, and several coal outcrops along the Yukon for this same reason (for example, see Cantwell 1904). Steamboats likely consumed many 100s thousands of cords of wood along Alaskan and Yukon Territory waterways. Innis (1936:261) reports that steamboats traveling *only* between Dawson and Whitehorse in the Yukon Territory used 100 cords of wood in a round trip, consumed a total of 13,000 cords in 1899, and 35,000 cords in 1902. This accounts for only a relatively short stretch of travel on the Upper Yukon. Coal mines eventually needed to be developed in order to keep supplying fuel to the White Pass and Yukon Railway (1936:262).

One last, important transportation feature relevant to the interior placer mining transportation and settlement system are the roadhouses and other unmanned shelter cabins located along roads and winter dog-sled trails. These are better referred to as Intermediate Supply Points, whose purpose was to supply food, shelter, and rest to people and draft animals while traveling along the long routes between centers of high population density. The exact number and location of small (e.g., 10x10 ft.) unmanned shelter cabins with small wood-burning stoves is difficult to ascertain, as their reporting in available reports is sketchy from year to year (ARC 1906-1927). More typically, they are not mentioned at all. Hence, they have not been located on the district-wide and Alaska-wide maps referred to repeatedly above. Needless to say, they were there, spaced along *all* of the routes discussed above, including the Chatanika-Beaver-Caro-Coldfoot trail, Tanana-Arctic City-Bettles-Coldfoot trail, Knik Arm-Susitna-McGrath-Iditarod or Dishkakat trails, etc. Manned roadhouses were spaced along more-traveled routes, operated independently by men, women, or husband-and-wife teams. The quality of service in these places could vary greatly from locale to locale, depending upon who operated the establishment (see especially Stuck 1916, in this regard). Manned roadhouses were in operation between Coldfoot and Bettles (c.f., Bettles Hotel Register), although their locations are presently unknown. As above, these special-purpose sites were strictly related to animal and human shelter and food. As such, little/no mining-related material is expected at such sites. Reports of archaeological investigations at two such roadhouse sites (Gamza 1995; Gibson 1984) support these expectations, with reported or excavated materials primarily related to food service and blacksmithing.

Lastly, we shall turn to a brief mention of settlement layout at Intermediate Transfer and Supply Points. Supply points, that is relief cabins and roadhouses, are easily assessed. Relief cabins were simple small log cabins (e.g., 10x10 ft., 10x12 ft.; ARC, various) located immediately adjacent to a dog sled trail. Roadhouses too were located just off of the travel route, and might include additional outbuildings or features related to its travel-oriented service, such as barns, dog lots, blacksmith shops, or machine shops. The arrangement of the buildings at the two roadhouse sites regarded above can only be described as "clustered:" having spatial proximity yet conforming to no regular linear or gridlike pattern (Figure 5.83).

Smaller Intermediate Transfer Points also conform to expectations of the placer mining hierarchy model (Table 5.11), that is, linear along the transfer route or "converging" at the confluence of two such routes. Historic photographs of Bettles (e.g., Hegg 1902:10; Northern Navigation Co. 1912:34; Drane n.d.:Photo #91-046-256; Bartlett n.d.:Photo #72-156-231; Schrader photo 808 USGS Historical Photo Library, Denver, in Brown 1988:182-183) demonstrate its continued lineal alignment along the Koyukuk River. Likewise, archaeological surveys at Dishkakat in 1996 (Figure 5.84; Sweeney 1997) demonstrate this site's lineal emphasis to (riverine) transportation access. No surveys have thus far taken place at Dikeman.

SUMMARY

This chapter assesses the seven Expectations formulated in Chapter 4 in terms of the "Dependency" relationship exhibited within Alaska, and between Alaska and the United States. Dependency Models, again, are typified in part by the following characteristics: (1) only “superficial” economic, political, and/or social change occurs in a "peripheral" zone, i.e., an area of migration/ colonization, relative to the "core" area, (2) change in the periphery is caused by external factors, or factors common to both internal and external environments, (3) there are many interacting links between a "core" area and the "peripheral" area, i.e., a low degree of insularity (c.f., Steffen 1980), (4) the periphery's economy is dominated by extractive industries where commodities, whether animal, vegetable or mineral, are exported to a "core" area, and where manufactured commodities are imported mainly from that core, (5) an often short-term and fluctuating settlement system accompanies the extractive industries, and (6) the economy is specialized to one or a few industries, not diversified.

The first expectation, Extractive Economy, was concerned with demonstrating an

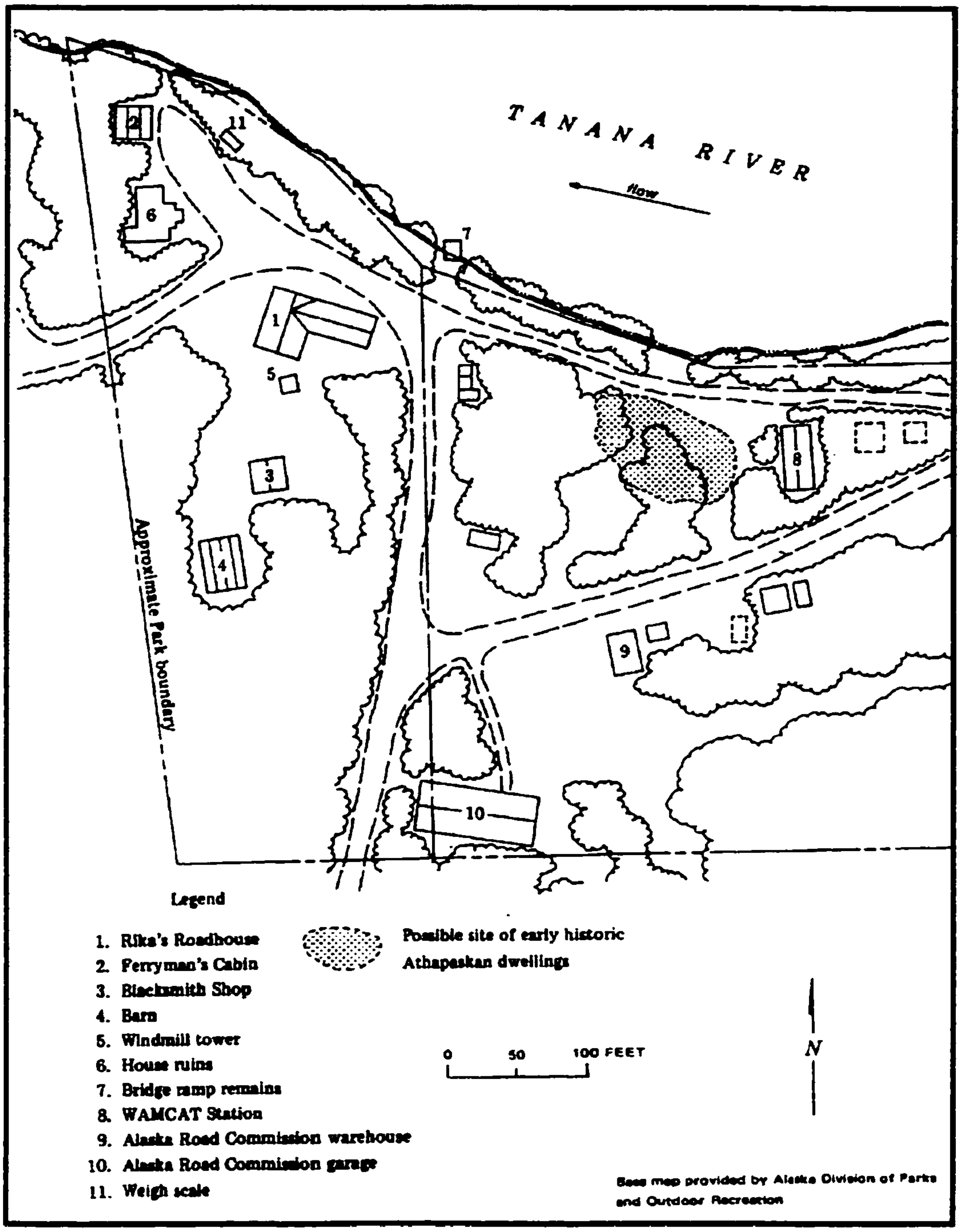


Figure 5.83 Western area of Rika's Roadhouse and landing site. Note the clustered nature of the layout pattern at this Intermediate Supply Point. (Source: Gibson 1984: Figure 2).

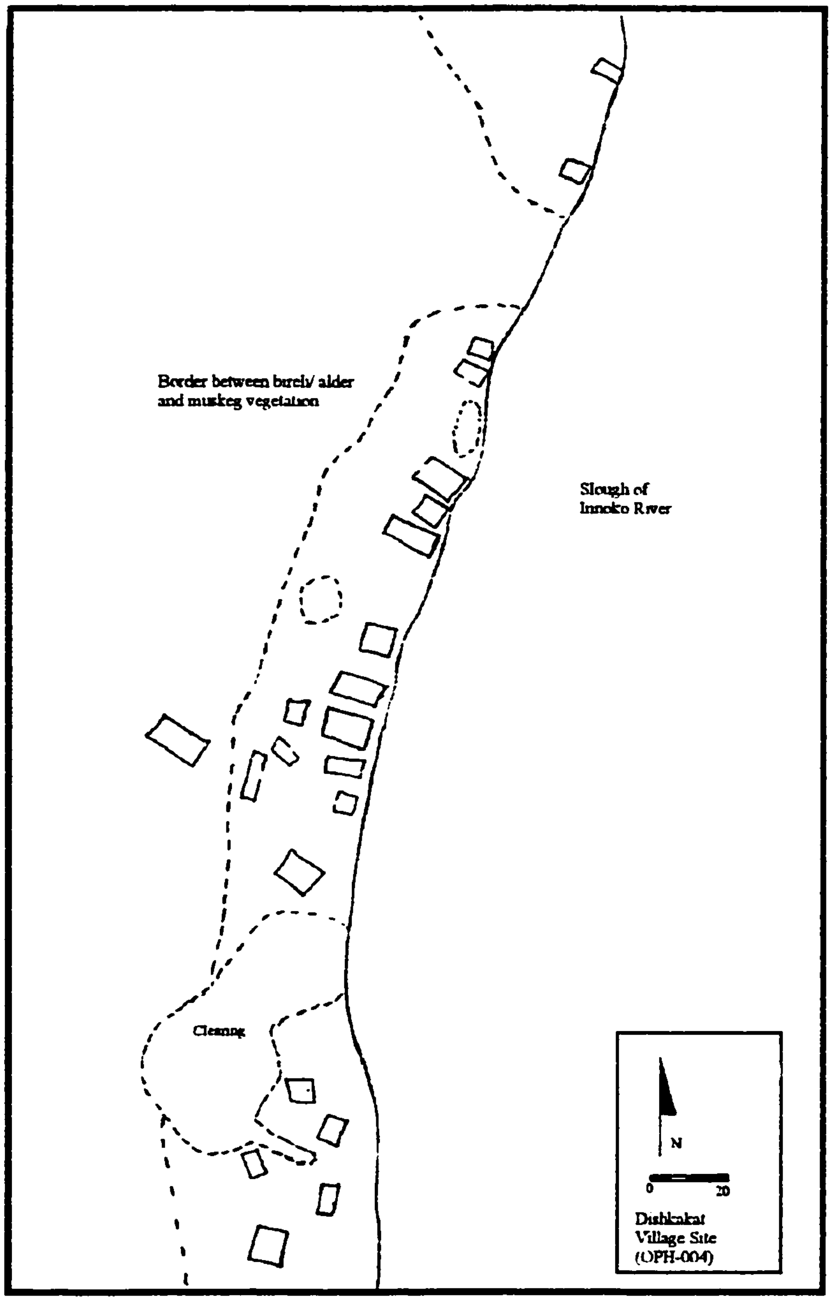


Figure 5.84 Dishkakat site map. Note the linear arrangement of the settlement to the transportation route at this Intermediate Transfer Point. (Source: Sweeney 1997).

"extractive" economic relationship between a "peripheral" area (i.e., Alaska), and its associated "core" area (i.e., the United States). Aspects of this "extractivist" relationship included no fundamental social or political change in the periphery relative to the core, a continuing close and extensive economic and social relationship between the periphery and the core, a heavy reliance upon manufactured commodities from the core, and a heavy reliance upon sending extractable resources back to the core. All expectations were corroborated by the Alaskan-United States data from the turn-of-the-twentieth century. More and more federal laws and legislation through time sought to further integrate Alaska within the U.S., witnessed by Alaska's shifting status from district, to territory, and finally to state. Many of Alaska's earliest American-era settlements were military posts, which were linked by 1903 by the Washington-Alaska Military Cable and Telegraph System, and which was linked to the U.S. via Seattle in 1904. WAMCATS allowed quick, effective, efficient, and relatively cheap communication between these two disparate geographic areas, and was used to transfer all manner of information, not solely military and governmental.

The second expectation, Settlement Fluctuations, anticipated short-term fluctuations in the founding, occupation, abandonment, and possibly re-occupation of individual settlements and districts, owing largely to the highly speculative nature of the economy and the high mobility of its population. Continuous changes to the transportation system are likewise expected. Whereas a steady relationship was witnessed between the placer mining population and production of placer gold *in toto* across Alaska, when we the shifted scale to the local or district level much fluctuation of population across the landscape was noted. When examining overall population fluctuations of four mining districts, both general patterns and particular patterns were evident. The general pattern of population change over time in all four districts examined here was an initial explosive growth in population and an equally dramatic decline in population within a couple of years, followed by a slow, eventual decline of the population in the ensuing years and decades. This general pattern, however, was interrupted in all four cases by particularistic variables which causes fluctuations in the population levels. Variables ranged between those that occurred Alaska-wide and affected all districts, to those that were local-specific and affected only particular districts. When overall numbers of services available in settlements (e.g., commercial, governmental, transportation, social and religious) were examined as proxy measures of population, the same results were witnessed: dramatic short-term fluctuations of settlements, as the miners, and those people which serviced the miners, moved around the landscape in response to newer mineral discoveries and output levels. Similarly, transportation routes fluctuated through time. However, such fluctuations were less dramatic than those witnessed by individual settlements. Transportation routes within and between districts developed fairly rapidly following the discovery of appreciable quantities of placer gold in a new area. However, they were less apt to be so readily abandoned. Few districts became so totally abandoned in the decade or two following a large-scale stampede that many of the established transportation routes did not receive at least minimal maintenance in the immediate following years. This may be the case because of the initial exorbitant cost of constructing such routes in the first place, along with the forethought that such routes could be useful in the future following newer discoveries or improvements in technology, which would make marginal districts once again profitable.

The third expectation, Placer Mining Settlement Hierarchy, anticipated a placer gold mining settlement hierarchy of up to five tiers, including one or more Entrepots, various Intermediate Transfer and/or Supply Points, a single Central Distribution Center, various Secondary Distribution Points, and numerous Extraction Camps. Minimally, a hierarchy of at least one Entrepot and Central Distribution Center is required. Table 5.11 presents specific locational, functional, layout patterns, and relative size characteristics of each hierarchy tier, which are all then assessed against both Alaska-wide data, as well as four gold mining districts (Koyukuk, Fairbanks, Innoko, Iditarod). Much specific, contextual data was presented addressing particular aspects of the Expectation and the model presented in Table 5.11.

Seattle was Alaska's sole Entrepot, which served as the major import-export link between Alaska and the United States. Seattle and the Central Distribution Center in each district had the largest number and variety of services. As placer gold is a non-renewable resource, all settlements based upon placer gold mining inside of the "peripheral" area (i.e., Alaska) are prone to fluctuations in both population and available services following the eventual decline in placer gold output, unless the settlements assume duties other than those solely related to mining.

Certain generalizations are evident in these hierarchy data. For example, the closer along the hierarchy a settlement is to the actual point of mineral extraction, the more prone it is to fluctuations (e.g., first Extraction Camps, then Secondary Distribution Points, etc.). Also, the precise numbers and types of settlement tiers witnessed through time within the four mining districts examined here were context-dependent. Although variable, each district's particular hierarchy tier relied essentially upon the same variables: (1) district population level, (2) topography, geomorphology and hydrology, and (3) available transportation technology. Also, all tiers in the hierarchy except the final Extraction Camps occurred at some geographical point involving a break in transportation, that is, where supplies were transferred from one means of transportation to another. Initially in our Alaskan example, many of these transfer breaks related to breaks in water transport, followed then by breaks in overland transport. Obviously changes in transportation technology (e.g., shallower draft steamers; construction of railroads) would have dramatic effects on pre-existing transportation systems, and the locations or even the existence of some settlements along these routes.

The fourth expectation, Changes In Settlement Hierarchy, anticipated intra-district shifting of economic, social, and political functions of individual settlements through time, sometimes rapidly, owing partly to resource depletion, changes in technology, and changes in transportation. Additionally, functions related to certain tiers of the settlement hierarchy were expected to shift up or down a tier in specific cases depending upon population density of the district. The data examined largely corroborated these expectations. Intra-district settlement hierarchy shifts were common in the four districts examined, the degree and rapidity of which were context dependent. Shifts between Secondary Distribution Points were especially prevalent, as spatially-proximate settlements competed with each other through time, some more advantageous than others as conditions and variables changed in a district. Likewise, all of the districts in this study, excepting Fairbanks, witnessed at least one change in its Central Distribution Center. Changing numbers of available services (e.g., economic, social, political, etc.) in towns through time indicated the degree and rapidity of such hierarchical shifts occurred within districts, the exact nature of each district being peculiar to its own historical setting.

The expectation regarding the vertical "shifting" of functions of tiers depending upon district population density was also supported by the data. The data support a strong correlation between richness of a district (in terms of gold output), population level, and number of Secondary Distribution Point settlements present in a district. Both numbers of Secondary Distribution Points, and range of available services provided by those towns, increased with population and gold output.

The fifth expectation, Individual Central And Secondary Distribution Settlements Development And Internal Dynamics, anticipated a rapid build up of population, number of available services, development of municipal governments, and various social structures (e.g., school, churches, theaters) in "central" settlements, which include both Central Distribution Centers and Secondary Distribution Points. These settlements, among other attributes, are expected to have numerous specialized retail and service outlets, male-oriented personal and social services, and relatively high numbers of union, public, and secret society lodges and halls. Central Distribution Centers were expected to have a gridiron spatial layout (with deviations resulting either from physical topographic limitation, and/or the non-arrival of anticipated stampeders). Secondary Distribution Points were expected to be either lineally-oriented alongside (between) a transportation route(s), and maybe a less-developed gridiron pattern (e.g., two-three streets in depth).

Lastly, Extraction Camps were expected to one or only a few domestic structures plus other structures or features related to the mineral extraction process.

By and large, data from the four mining districts examined conformed to expectations. Rapid growth of "central" settlements has been demonstrated in other discussions above, in terms of both population size and actual number of services (e.g., economic, transportation, social, political, etc.) available to the miners and supporting population. Data from a wide variety of mostly primary but also some secondary documentation enabled at least a partial reconstruction of the types and numbers of services available in 48 separate mining or mining-related (i.e., supply or transfer) towns throughout interior and coastal Alaska. The data, divided into 28 different types or varieties of services, were presented graphically through time, supporting the specific aspects of the expectation listed above. Characteristics of Central Distribution Centers made apparent in this analysis were that only this settlement tier (along with a select few of the largest Secondary Distribution Points) contained certain services and facilities associated with larger and more-permanent settlements. Such services include federal judicial and law enforcement personnel, banking facilities, churches, municipal incorporation (and associated local law enforcement, school board, taxation, pollution maintenance, etc.), wholesale stores, and some food production and non-edible commodity production (though only for local consumption, not for export). Lastly, the settlement layout data conformed perfectly to expectations.

The sixth expectation, A Resource-Based Settlement And Transportation Pattern, anticipated a settlement pattern dictated by the "patchy" nature of the exploited resource, resulting in a non-dendritic, that is, not branching further and further inland from a coastal link to the "core." Expansion is neither even nor slow and continuous away from this coastal link, but instead "reaches out," in some cases over great distances, and connect with an otherwise isolated yet relatively highly developed mining district. Initial transportation routes are anticipated to take advantage of pre-existing systems of transport (e.g., navigable rivers and streams), which may be left intact or otherwise rapidly replaced depending upon least-cost principles related to profitable extraction of the resource.

Expectations again were largely corroborated by both Alaska-wide and district level data. Relatively highly-populated settlements developed along the perennially ice-free southern coastline of Alaska, which ultimately developed efficient transportation routes into the interior and supplanted earlier Yukon River-based supply routes. The exact founding of placer gold mining settlements and districts throughout interior Alaska (from the 1880s through to ca. 1914) was dictated not by a slow, outward progressive development over an evenly spread out resource (e.g., arable land). Instead, the founding of placer gold settlements and districts resulted more from luck of discovery of workable quantities of gold, geological processes that created the "patchy" nature of this resource across the landscape, as well as existing level of technology that allowed the transport of people and supplies and the extraction of commodity.

The transportation routes that developed to supply these districts also reflected these variables. These routes did not "branch" outward and outward from a coastal link, but instead were "trunk"-oriented (as opposed to "branching"), linking together otherwise relatively highly-developed areas or "islands" within an otherwise underdeveloped, under-populated "sea." Overland routes <u>into</u> three of our four mining district case studies never progressed beyond winter dog-sled or summer pack trail status. This situation typified inter-district travel, prior to the arrival of airplanes in the early-mid 1920s. However, *intra*-district transportation was relatively highly developed, including wagon roads, tram roads, tram ways over water, and even narrow-gauge railways. In fact, the Fairbanks district's narrow-gauge railway was operating <u>prior to</u> the complete upgrade to wagon road status of the Valdez-Fairbanks road.

The last expectation, Transportation Frontier, anticipated a system of services along the mining transportation supply routes that reflected (1) the nature of the goods and services used along those routes, (2) the nature of the commodity transported along those routes, and (3) the physical environment and the level of transportation technology available to that time and place. Such sites corresponded in our settlement hierarchy model (see Table 5.11) to Intermediate Transfer Points (where a change in mode of transportation was required), and Intermediate Supply Points (a stopping or resting place, which served the needs of a particular mode of transportation, its employees, and/or its passengers). Intermediate Transfer Points would exhibit variable layout patterns, either linear or "converging," and any gridiron build-up within such settlements would be minor and context-dependent. Intermediate Supply Points would exhibit a "clustering" settlement pattern.

Once again, the expectations were largely corroborated by available data. The major coastal Alaskan settlements which served as the first, or Primary, Intermediate Transfer Points from the Entrepot (where goods were transferred into the interior of Alaska from ocean-going water craft) included Skagway in Southeast Alaska, Valdez in Prince William Sound, and St. Michael near the mouth of the Yukon River, in Norton Sound. By far, St. Michael was the principal transshipment point for the bulk of supplies entering the interior, prior to the completion of the Alaska Railroad in 1923 from Seward on the Kenai Peninsula to Fairbanks. Following St. Michael, the next major Intermediate Transfer Point for three of the districts occurred at the acknowledged heads of low-water small steamer navigation, which included Bettles on the Koyukuk River, Dishkakat on the Innoko River, and Dikeman (and later Iditarod) on the Iditarod River. Fairbanks, a Central Distribution Center, was also the next major Intermediate Transfer Point for the Fairbanks district, and coincidentally was also near the head of steamer navigation up the Chena River. The town of Fairbanks also served, at least partially, as a transfer point for the other three mining districts examined here, as larger steamers from St. Michael could usually ascend all the way to its wharves, and transfer their supplies to smaller steamers.

Population, number of available services, and duration of occupation were all extremely variable among these coastal (Primary) and interior (Secondary) Intermediate Transfer Points, depending upon type of and changes in transportation technology, and the general gold output of the mining districts. Relative to their interior counterparts, Primary

Intermediate Transfer Points on the coast were of course longer-lasting, spatially larger, and thus exhibited gridiron layouts because they served larger overall areas. Secondary Intermediate Transfer Points were much smaller and linearly aligned along their respective rivers. Excepting Dishkakat where little primary documentation exists, all other Secondary Intermediate Transfer Points had wharves and/or warehouses, clearly an anticipated feature of settlements whose primary function was the loading and unloading of passengers and supplies.

Finally, Intermediate Supply Points were found along those transportation routes where travel longer than one day was anticipated. These services included manned roadhouses and unmanned small shelter cabins (depending upon isolation and density of number of travelers) along dog sled trails, sled routes, and all-season wagon roads. Much of the Alaskan winter dog sled trail system, and any supporting shelter cabins and roadhouses, declined dramatically following the introduction and spread of the airplane throughout Alaska in the 1920s and 1930s. If consisting of more than a single structure, the layout of Intermediate Supply Points exhibit a clustered, non-geometric pattern next to the route of travel.

CHAPTER 6
CONCLUDING REMARKS

REVIEW OF OBJECTIVES OF THE STUDY

The search for underlying variables and processes that contribute, in part, to the formation of the archaeological record is what binds this dissertation and its chapters together. In short, this study is about providing explanation to observations taken in the contemporary world, about processes, variables, and resulting human decisions that took place in the past. My field of inquiry was the Alaskan placer gold mining scene at the turn-of-the-twentieth century. This time and place, though, is really of no consequence to the results or direction of the study. The approach of the study itself, that is, its underlying assumptions and methods, are what this dissertation is about. The Alaska mining scenario is only a case study to which the advocated approach was applied.

A second basic goal of this present research was the elucidation of appropriate methods and techniques for distinguishing and recognizing these variables and processes. While the aim is to provide incontrovertible "bridges," or middle range linkages, between present static remains and past active dynamic processes, we can only view the present dissertation as (hopefully) as step in the right direction. This dissertation is seen not as a final, finished product, but instead part of a continuing effort to (1) provide explanation to a particular historical setting (i.e., Alaskan placer mining at a variety of spatial scales at the turn-of-the-century), and (2) distinguish methods to recognize linkages between present observable statics (e.g., artifacts; settlements) and past processes, variables, and their effects upon human decision making.

In essence, the chapters in this dissertation all conform to this search for understanding processes and variables in a past historical setting. Chapter 3 (Abandonment As A Source Of Archaeological Variability) was about trying to control and account for past processes and variables that affected numbers of artifacts, attributes of artifacts, and arrangement of artifacts deposited in the archaeological record. Chapters 4 and 5 (Formulating A Dependency Model For An Early Placer Gold Mining Settlement System; and Assessing The Dependency Model For An Early Placer Gold Mining Settlement System) likewise were basically about outlining what variables and processes contributed to a host of settlement and transportation systems characteristics. And the presentation in Chapter 2 (Archaeological Investigations At Three Interior Alaskan Gold Rush Mining Settlements) was about providing both historically-known processes and variables and baseline archaeological data from three interior Alaskan mining settlements. As explained further below, whereas Chapters 3-5 utilized other researchers's data and generalizations to provide explanation to our specific Alaskan case study, Chapter 2 was about providing other researchers with baseline historical and archaeological data about a hitherto largely ignored archaeological data set. The hope is that these data will be used elsewhere by the approach advocated here.

The specific contents and results of our inquiries into settlements, layouts, commercial services, core-periphery relationships, artifactual attributes, etc. are synthesized in summary sections at the end of each of the chapters. The interested reader is referred back to these for particular results and conclusions of these efforts. The remainder of this concluding statement will outline the historical archaeological approach advocated and illustrated in this dissertation, including the basic assumptions or paradigm on which the study is based (*Assumptions: Binding the Study Together*), and the scope and methods used herein (*Scope and Methods of the Study*).

ASSUMPTIONS: BINDING THE STUDY TOGETHER

The first basic assumption of this study is that numerous processes and variables occurring at a variety of spatial and temporal scales affect and condition the decisions that people make on a daily basis at their places of work and habitation (see again Figure 1.2). Human decision making is responsible for why settlements are located where they are, and why certain tools and other artifacts are used, made, and ultimately discarded on the landscape. Thus, understanding patterns in both settlement systems and artifactual residue in large part deals with understanding and deciphering what processes and variables were in operation in the past. Understanding what happened in the past, and what artifacts and types of settlements are present where they are, is akin to understanding past human decision making, which is akin to understanding what past conditions and natural and cultural processes and variables were in operation in that particular time and place. Obviously, we also need to take into account natural and cultural post-depositional processes. One of the aims of undertaking the archaeological abandonment aspect of this dissertation (Chapter 3) was recognizing how conditions and variables during and after abandonment affect material residues patterns. We saw that artifactual patterns may have little to do with behaviors, decisions, and activities of people during most of a site's occupation, but instead only related to its last stages of abandonment (c.f., Tomka and Stevenson 1993:193).

The second basic assumption of this study is related to the first, and deals with the *nature of the relationship* between those processes and variables (at different temporal and spatial scales) that affect human decision making in particular times and places. It is believed here that different historical settings (in time and/or space) may be comparable because they may "share" or endure similar operating processes and variables, which may evoke similar responses or decisions by otherwise distant and disparate peoples. For instance, mining locales may share similar environmental conditions, but be separated in time by 100s of years and 1000s of miles. They may be part of the same global colonial empire, but be extracting different resources or raw materials. They may extract the same resource and have similar environments, but the actual mining population may be of different socio-cultural backgrounds. The point is that meaningful comparisons can be made between seemingly disparate times and places owing to a similarity in shared variables and processes affecting those different settings.

The last basic assumption of this study is that although comparisons between different historical settings may illuminate shared similarities of variables and processes, each particular historical setting is its own unique combination, or conjunction, of historical variables, processes, peoples, and events. Hence, we are *not* advocating a neo-deterministic approach to history or culture. We are simply seeking to understand what processes and events contributed to the history of any setting, whether extremely particular and unique to time and place, or else completely generalizing to many times and places. The particular and the general combine together in any setting, producing a unique historical sequence which the historian or historical archaeologist seeks to understand or explain.

SCOPE AND METHODS OF THE STUDY

This study sought to provide explanation to how, why, and when mining settlements in Alaska at the turn-of-the-twentieth century were located and laid out on the landscape, what, where and why certain functions and services were provided in such settlements, and how and why were the settlements linked together. These basic issues were explored in Chapters 4 and 5. This study also sought to provide explanation to why excavated artifactual remains occurred where and when they did, in the conditions they were found in, along with their spatial arrangements. Such questions were explored in Chapter 3. However, as stated above, these seemingly disparate aims are effectively the same: understanding those past dynamic variables and processes responsible for the static patterns observed in the present.

The assumptions outlined above and the methods used in this study are inextricably linked. The basic methodological approach used in this dissertation is as follows: series of explicit "expectations" (generalizations) were formulated and then evaluated against independent data sets. One series of expectations was formulated to evaluate various aspects of placer gold mining settlement and transportation systems (Chapter 4 and 5), and another series evaluated various characteristics of artifacts probably relating to site and feature abandonment processes (Chapter 3). The mining settlement system expectations derived mostly from previous comparative historical research regarding the influx of migrating populations into new geographic areas (i.e., "frontier" research), or else from research which specifically addressed late-nineteenth century mining in western North America. The abandonment expectations, on the other hand, derived mainly from research which examined archaeological settings with historically-known abandonment conditions, or else were derived from direct contemporary ethnographic observations. As above, efforts were made to find parallels in similar formative processes and variables which may have solicited similar behavioral responses or decisions. To avoid obvious tautologies, expectations and supporting models or hypotheses were derived solely from research or studies from outside of the Alaskan study area. After their formulation, the expectations were then evaluated against Alaskan data sets derived from the turn-of-the-twentieth century. Again, each chapter above ends with a Summary section which synthesizes its results and findings.

Finally, Chapter 2 provides a variety of structural foundation and artifactual descriptive data from the 1994 and 1995 excavations at the mining settlements of Coldfoot, Tofty, and Wiseman. This chapter included historical outlines for the three mining settlements investigated along with histories of their archaeological investigations, along with sections on architectural detail from seven excavated foundations, descriptions of other excavated features (e.g., trash pits; privy), a chronology of all excavated features based upon the artifacts, and discussion sections related to commodities and brand names, and local manufacturing and artifactual re-use activities. Appendix E provides at the back of this dissertation a complete listing of numbers and types of artifacts recovered from these excavations. Although Chapter 3 examines aspects of these archaeological data, it examines only specific attributes of the artifacts (e.g., completeness, usability, size) necessary to address the specific expectations related to abandonment. Since only one other excavation and publication exists for an interior Alaskan mining settlement (i.e., Fairbanks; see Bowers and Gannon 1997), and none for the numerous abandoned, short-duration mining settlements that dot the Alaskan landscape, it was felt necessary to provide at least baseline data in this study. The aim is to provide a data set available to other researchers for comparative purposes, hopefully for the construction of models, hypotheses, and expectations in the manner advocated in this present study.

ENDNOTES

Chapter 2

[1] These materials from 1997 are currently being catalogued, and are not available for discussion at this time.

Chapter 3

[1] As illustrated, Figures 3.6-3.8 are graphically not correct, in that they show curved connecting lines of what are otherwise discontinuous, discrete data. Continuous data (e.g., human growth height in centimeters recorded annually) may be "filled in" or "connected" in the manner presented in these figures. However, Figures 3.6-3.8 illustrate "patterns" that are not adequately or clearly illustrated by displaying the data in bar chart format. The purpose of the figures is to compare the size categories of usable artifacts between the different excavated features in this report; that is, comparative pattern recognition, and the explanation of similarities and differences between the features. The figures as presented serve this purpose better and more clearly than "correctly" illustrating the data in bar charts, and are thus retained in their present format.

Chapter 4

[1] Francaviglia's (1991:82) suggestion that the regular platting of mining towns occurs during a second "formalized phase" of a mining district, characterized by consolidation and mass-capitalization by outside companies, does not fit this scenario. Perhaps his characterization is more typical of lode mining development, and thus is not directly relevant to our current discussion.

Chapter 5

[1] The only data available for Seattle received via University of Alaska Fairbanks interlibrary loan was for 1901; thus, this was the only data used for Seattle as a comparative measure for all temporal graphs requiring an Entrepot perspective.

[2] An unnamed trading post had been built the previous summer a little down river, but lasted only until the subsequent spring breakup; Brown 1988:149.

[3] In 1901, all of these companies excepting the N.A.T.T.C. would merge into one trading company, the Northern Navigation Co., along with one transportation company to supply it, the Northern Navigation Co., effective early in 1902.

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APPENDIX A
COLDFOOT, ALASKA: A PALYNOLOGICAL AND MACROFLORAL ANALYSIS OF AN OUTHOUSE FEATURE

by Dawn M. Marshall, 1997

INTRODUCTION

The dietary remains of prehistoric and historic societies can give information about what was being eaten, how much, how often, and the overall well being of the population. From pollen studies, the time of year may be discerned with high concentrations of certain pollens indicating dietary choices (Reinhard and Bryant: 1992). Macrobotanical remains also contribute to the question of diet and environment; whereas parasitological studies answer questions of trade, environment, health and disease, and soil analyses (Reinhard 1992). In a historic context paleoethnobotanical studies are more often carried out in a privy or outhouse feature where seeds, pollen, and parasites may be recovered and analyzed. The availability of these potentially quantitative remains is the one constraint in any analysis. Unfortunately, for this study availability was a major concern.

In 1897, the territory of Alaska was still in its infancy. The harsh conditions found there were not conducive to large numbers of settlers, however, with the advent of the last gold rush of the late 19th century, Alaska became the destination for thousands of fortune seekers. It is here that archaeologists from the University of Alaska, Fairbanks are attempting to ascertain what life was like for these miners.

In Cold Foot, Alaska, which is located approximately 80 km above the Arctic Circle, north east of Fairbanks, the remains of a late19th century gold town are being uncovered. It lies "at the confluence of Slate Creek and the middle fork of the Koyukuk River" (Mills 1997), and was first settled in 1899 when quantities of gold were discovered on Myrtle Creek, a tributary of Slate Creek. "By 1902 a post office, two stores, a gambling [house], two roadhouses, and seven saloons had been established" (Mills 1997). As the gold began to play out, the towns inhabitants began to relocate further north in the town of Wiseman where gold was still available. Slowly, many of the buildings of Cold Foot were moved to

Wiseman, with most of the remaining structures being used for firewood. Historically. there was at least one family still living in Cold Foot between the 1920s and 1950s. Currently, Cold Foot is uninhabited, except for the Arctic Acres Inn and Arctic Adventures Touring Company. As a result it has become a destination only for tourists and archaeologists.

Through the efforts of summer field schools, the University of Alaska at Fairbanks began excavating at the Cold Foot site. To date, the excavations have uncovered five cabin foundations, four trash pits, and part of a possible outhouse feature. Three levels were identified at the possible outhouse feature within the total depth was 66 cm. Soil samples were collected every 10 cm from the outhouse feature and sent to the Texas A&M Palynology Lab where they were analyzed to determine whether this feature was an outhouse, a trash pit or both.

Due to poor preservation, fungal degradation or other unknown agents, pollen was virtually non-existent. The few recovered pollen grains represented counts that were too low to gather any statistically significant data. What minimal pollen was found represented taxa of the expected flora for this region of Alaska such as: pine, birch, willow and grass. Samples were also processed for phytoliths and parasites. However, since neither of these micro remains were found, the methodology section contains only those procedures associated with the pollen and macrofloral analysis.

METHODOLOGY

Seven samples were taken at 10 cm intervals from the wall profile of feature 11 (Mills 1997). "The samples were taken...[after] completely scrap[ing] away a thin layer from [the wall profile] before taking each sample, so as to avoid any potential contamination; the trowel too was completely wiped off between samples" (Mills 1997). After the samples were collected they were labeled, placed in aluminum foil, sealed in zip-loc bags and sent to the University of Texas A&M Pollen Lab. From each of the samples three grams were measured out and placed in a 500 ml beaker with approximately 200 ml of distilled water. To each of these samples two lycopodium tablets were added to be used as marker grains. Next, the samples were sieved with a 350 micron mesh and then by a 150 micron mesh screen using 95 percent ethanol and water. This procedure separated the sediments and organic detritus from the pollen. Initially, four samples were processed and designated as A, B, C, and D (A = sample number 1, B = sample number 3, C = sample number 5 and D = sample number 7.)

Acetolysis was used to destroy organic material (Erdtman: 1960). While in acetolysis, the samples were heated to 200 degrees Fahrenheit for approximately 20 minutes. Next, the samples were neutralized with glacial acetic acid, rinsed with water and centrifuged several times.

Because of the large volume of organic material, a second acetolyis procedure was needed. Upon examining the samples, virtually no pollen could be found, but a substantial amount of fungal spores were present. The other three samples were processed in a similar manner.

Macrofloral analysis of the samples produced better results. Before screening the samples for macrofloral remains, 10 grams of each sample was put aside and labeled for future pollen, phytolith and parasite studies. The remainder of each sample was screened using light fraction graduated screens (U.S. Standard sieves with 2 mm, 1 mm, 0.5 mm, and 0.25 mm openings). Each sample was initially divided into those materials greater than 2 mm and those less than 2 mm. The material was then examined using a binocular microscope at 8x and 40x. Macrofloral remains were identified using reference manuals and the modern reference seed collection at Texas A&M University.

RESULTS

Macrofloral analysis revealed seeds of: 1.) Berry (Rubus) ROSACEAE which could be from cloudberry, raspberry, salmonberry, thimbleberry or dewberry, 2.) Grape (Vitus)

VITACEAE, 3.) Chili peppers (Capsicum) SOLARACEAE, 4.) Crowberry (Empetrum) EMPETRECEAE, 5.) A species of mustard, BRASSICACEAE, 6.) A species that strongly resembles strawberry, CELASTRACEAE, and 7.) One unknown. Other materials found in these samples included: charcoal, pieces of newsprint, glass fragments, fish vertebrae, and unidentified fragments of bones. The seeds from the ROSACEAE family could not be separated to species. Likely candidates include: Rubus pubescens (dwarf raspberry), Rubus parvifloris (thimbleberry), Rubus idaeus (raspberry), Rubus spectabilis (salmonberry), and possibly Rubus flagellaris (northern dewberry). Most of these seed types are indigenous to the area.

DISCUSSION

The lack of pollen in the samples proved to be a significant obstacle in the analysis of the data. Possible reasons for this lack of pollen includes: 1.) at the time of use there was a wooden structure surrounding the feature; 2.) this feature was in use for a short period of time; 3.) it may have been used exclusively in the winter and/or 4.) the processing was in some way at fault. Since no samples were available to establish the baseline level of pollen for the surrounding area, there was no way to determine conclusively if the levels of pollen in the feature were anomalous for the region. However, the marginal levels of pollen that were found may indicate a limitation on the influx of pollen on the site. This would be consistent with the presence of a structure. Other evidence that may support the presence of a structure is the fact that newsprint was found in levels 3 and 4. Newsprint was often used in the capacity of a personal hygiene product, before the advent of bathroom tissue. The newsprint would give credence to this feature being an outhouse and having a structure surrounding it.

This feature was only 66 cm in depth and from the diagram of the wall profile it appears to be approximately the same in diameter. Because of this limited size if it was being used as an outhouse it was most likely only used for a short period of time. If this were the case a short duration of use would also be consistent with limited pollen counts, depending on the time of year this was in use. Pollen is mostly dispersed during the spring and summer of the year and therefore, use exclusively in the fall or winter may also be responsible for the limited pollen accumulation.

I processed the samples first. Later Dr. Bryant and I processed them again. In both cases tracer spores were found. Tracer spores are known quantities of spores that are added to a sample to quantify the data and to establish whether the processing procedures destroyed pollen. If no tracer spores are found after the addition of spores, then the processing is faulty and the samples would need to be reprocessed using a different procedure. Since tracer spores were found, this is an indication that if pollen were present in the samples it would have survived the processing.

Pollen may have been initially present in the privy, but became degraded due to environmental conditions over time. Also, different pollen grains are subject to differential decay. For example "Lycopodium and Taraxacum, which are resistant to decay in river clay and leaf mould, are practically impervious to cavitation, whereas Alnus, Myrica and Corylus, which are most susceptible to decay in these two soil types, show the most extensive cavitation" (Havinga 1983: p.543) (Cavitation is the formation of cavities in the surface of the pollen exine). This type of differential decay is due mainly to a compound that is found in the pollen wall called "sporopollenin". It is one of the most durable organic materials found in nature and is found primarily in pollen and spores. Experiments show that there is a direct correlation between the amount of sporopollenin in the pollen/spore wall and the ability of the grain to resist oxidation and thus remain preserved (i.e. the better the preservation the more sporopollenin that is present). Pollen preservation is affected by pH, oxidation potential (Eh), fungal decomposition, and wetting and drying episodes (Bryant and Holloway: 1983). At this particular site it is not known if the oxidation potential is at an acceptable level. The same holds true for the pH level, however, it was noted that there was a stand of spruce nearby at the time of occupation. Since the family of "pines" requires acidic soil and this site is located above the arctic soil it has been assumed that the soil is/was acidic. Acidic soil has been shown to be better for pollen preservation.

Fungal degradation is the last factor and the one that I believe played a major role in the lack of pollen. Fungi grows best in soils that are damp but still oxygenated or in soils that go through wetting/drying episodes (Holloway: 1981). Upon opening the samples I noted that there was a layer of a white substance on many of the clumps of soil. However, no analysis was performed to verify the presence of "fruiting bodies, spores, and hyphae fragments" (Reinhard) , which would positively prove that fungi were present.

Another avenue that would provide additional information is the presence of parasite eggs. By identifying the presence and the number of different types of parasite eggs, information regarding the health of the inhabitants may be derived. However, it should be noted that parasite eggs are also susceptible to the same types of decomposition as pollen. Unfortunately, the examination of three samples yielded no traces of parasite eggs.

The bones found in these samples appear to be fish vertebrae. These were approximately 5mm in length and 3 mm in width. There is the possibility that these bones were the result of some fish being eaten whole, such as sardines but the specific species of fish cannot be confirmed at this time. The other various bone fragments could represent small rodents that found their way to this feature, however, I was unable to find a comparative collection that could substantiate this. The grape seeds that were recovered are of a cultivated variety and were most likely from raisins since the desolate location of Cold Foot would make it very difficult to deliver fresh grapes. In addition, the climate does not lend itself to the cultivation of grapes. Therefore, it is more likely that raisins were being transported by pack or dog sled. Vitus or grapes are not native to Alaska, neither is Capsicum or chili peppers of which seeds for these have also been found. Chili peppers could possibly have been grown in a garden but these are more likely to have been dried and transported as well. As to the charcoal, trash with wood may have been burned in this feature or the wood charcoal was being thrown into this feature to decrease the odors of an outhouse. The charcoal fragments ranged in size from 2mm to 2cm with the majority of the pieces being in the smaller size range.

Table A.1 Numbers and types of seeds and other items, Coldfoot Feature 11 (source: Marshall 1997)

	Sample 1 (0-10 cm)	Sample 2 (11-20 cm)	Sample 3 (21-30 cm)	Sample 4 (31-40 cm)	Sample 5 (41-50 cm)	Sample 6 (51-60 cm)	Sample 7 (61-66 cm)
	# seeds	# seeds	# seeds	# seeds	# seeds	# seeds	# seeds
ROSACEAE Rubus sp.	108	55	35	49	24	83	72
VITACEAE Vitus	8	11	2	12	5	3	9
SOLARACEAE Capsicum	1	0	5	0	0	0	0
EMPETRACEAE Empetrum	25	1	0	0	0	0	0
CELSTRACEAE Euonymous	63	0	18	25	10	10	0
	# Other	# Other	# Other	# Other	# Other	# Other	# Other
Bone (unid. fragments)	10	0	0	0	1	0	0
Bone (probably fish)	0	0	0	5	0	1	4
Charcoal fragments	20	2	1	0	1	20	20
Wood fragments	0	0	1	0	0	0	0
Glass fragments	0	0	0	13	0	0	0
*Newsprint found	0	0	Present	Present	0	0	0
Total Mass (g)	37	41	33	36	38	33	44

Excerpts from a single piece of degraded newsprint:

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(Found in level 3)

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Dr. Vaughn Bryant afterword:

Date: Sun, 21 Dec 1997 20:52:48 -0600
From: V M Bryant <vbryant@tamu.edu>
To: "Robin O. Mills" <FTROM@AURORA.ALASKA.EDU>

Thanks for your comments. Yes, we would be interested in looking at future materials, should the occasion arise, and should we have time to look at them.

As for the analysis of this privy, I was disappointed that there was not more pollen. As to why...that is a good question. Fungal decay may have contributed to it, but frankly, I think the primary problem was that the structure was enclosed and thus was not exposed to airborne pollen to any great degree. Also, if the privy was used mostly in winter, that would have added to the problem of not having any pollen enter the samples. In the future, when samples are collected, I suggest immediate freezing of the material. That will stop any microbe decay and will not damage seeds or pollen that might be present. Another alternative would be to add alcohol (not too much) to each sample. That also will kill microbes in the samples.

Good luck on your dissertation...

APPENDIX B

DETAILED ARCHITECTURAL DESCRIPTION OF THE EXCAVATED STRUCTURAL FOUNDATIONS AT COLDFOOT, TOFTY, AND WISEMAN

COLDFOOT FEATURE 1

Coldfoot 1 dimensions and basic outline: The interior dimensions of Coldfoot Feature 1 measured about 11.4 m, and consisted of two separate rooms and a probable small "shed" adjoining the northwestern end of the foundation (see Figure B.1). The internal width between these three rooms varied slightly, measuring ca. 3.5 m for the northern-most small shed and the middle room, and ca. 3.25 m for the southern-most "storage box" room. If we are correct in assuming that the small northern part of the foundation actually is a storage shed, then the habitable floor area of this feature corresponds only to the two larger rooms, which together have a total floor area of ca. 32.78 m^2 (with the northern small room added, the total internal area is 38.69m^2). The wood illustrated in Figure B.1 were all that remained of structural elements of this foundation, the remainder being scavenged.

It is noted that floor areas provided here and in the foundation features described below might differ slightly from the excavated area used in the Abandonment Chapter 3, owing to different rounding to whole numbers, estimations of complete floor areas based upon partial excavations, and inclusion of sill log areas in the abandonment exercise. The differences are slight, typically less that 0.8 m^2.

Coldfoot 1 arctic entry: Coldfoot 1 has what is interpreted as an "arctic entry" adjoining to the short-axis southeastern sill log. An arctic entry is a small enclosed area (with or without a door) constructed around the outside of the main entrance into a cabin, and did *not* necessarily span the entire face or wall it was built against. It was typically used for storage but also served to minimize heat loss during entry into the main living area (if totally enclosed). Historic photographs from turn-of-the-century interior Alaska

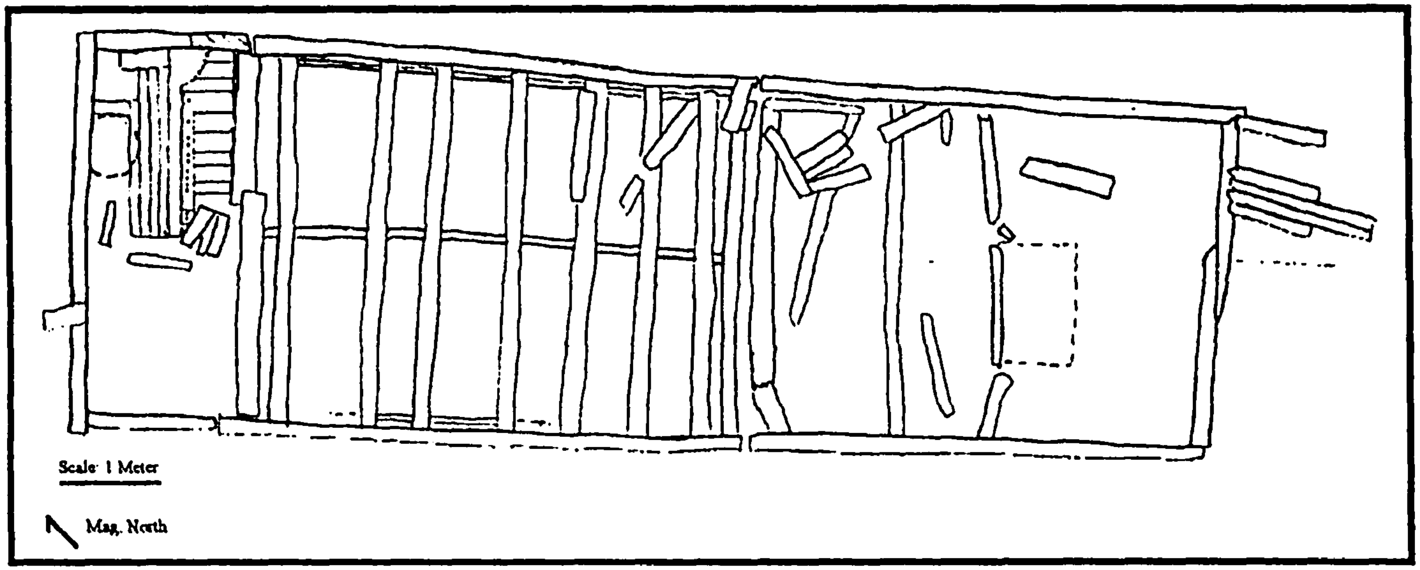

Figure B.1 Coldfoot Feature 1, excavated foundation's remaining structural elements.

indicate that such adjoining structures, if present, were normally of vertical standing poles or logs, and not horizontal notched logs as used in the main cabin construction. As such, they were likely not as efficiently insulated than the cabin itself. Also, if the vertical poles were placed directly upon the ground, they might not have sill logs to delimit their outlines. One photograph from 1902 Coldfoot (George Lounsbury personal photograph collection) illustrates that such features were indeed present at the town site. In addition, the one remaining partially standing cabin at the site (Feature 23), occupied into the 1950s, also has an enclosed entry in front of the main doorway, occupying about half of the wall to which it adjoins.

This southeastern entry was discovered by following a log southward from the eastern corner of the foundation on the last day of field season 1994. In 1995, we returned and excavated this area, uncovering, in addition to this log, four *in situ* floor boards. All five pieces of wood were parallel, and slightly askew to the rest of the foundation (Figure B.1). The probable limits of this tiny room were ca. 1.9 m wide and extended outward ca. 2 m. from the wall. These dimensions correspond to the limits of an apparent built-up "pad" of sand and small gravel onto which the floor boards were laid. This pad is higher in elevation (only a few centimeters thick) than corresponding matrix underlying this area of the site, as determined by test pits placed around this entry and foundation. The extent of the entry from the wall was estimated by a rapid decrease in number of artifacts, which concentrated on top of the floor boards and around them for ca. 20-30 cm, and thinning out quickly beyond that. The ends of the four floor boards furthest from the sill log were all sawn through, but the edges on top of the foundation's sill log were broken off and jagged.

<u>Coldfoot 1 sill logs, basic stratigraphy, and corner notching</u>: The foundation consisted of *in situ* sill logs all around the four sides of the foundation. In addition, first wall logs above the long-axis sill logs of the two main habitation rooms were found intact and *in situ*. This was not the case with the three sill logs forming the base of the shed, nor with the southeastern-most sill log. In these instances, only the sills were present, with no

remaining wall logs. The sill logs of the two main rooms were flattened on top, likely by sawing, in order to receive a tight fitting and thus more insulating wall log on top of it. Also, at least some sections along the bottoms of the four first wall logs too had been flattened. Poor preservation prevented corroboration of this for the entire lengths of all four first wall logs. Traces of spruce bark occurred on several of the sills or first wall logs, indicating both their species and final form during construction. As far as may be determined, all sill and first wall logs were sawn through at both ends, none having been chopped down. In addition, all sills and floor joists (discussed below) rested upon a sterile clay (Level 3). Artifacts were found throughout the silty Level 2 fill, but were particularly numerous at the transition with Level 3. In most excavation units we found a thin, 3-4 cm thick dark organic loam layer directly at this transition, a layer that correlates to the old forest ground surface upon which this foundation was originally built.

Both the sills and first wall logs of the long axes of the two main rooms did not in fact touch one another (Figure B.1). A specific effort was made to determine if these eight logs (four sills and four first wall logs) were in fact touching, end-to-end. None did; they were all slightly separated by a few centimeters from their adjacent partner. Likewise, none of the *in situ* first wall logs overlapped on top of the adjacent sill log, neither (1) where the two main rooms came together, nor (2) where the middle room abutted to the northwestern shed. On the other hand, the long axis sill logs of the southeastern-most room both butted up against the southeastern sill log of the foundation. The first wall logs on these long axes sills then proceeded to slightly overlap this southern sill log, with the underside of the first wall logs exhibiting ventral saddle notching to conform to the shape of the log underneath. The southeastern sill was in fact two separate logs, in which the log deriving from the eastern corner overlapped the one from the southern corner by 73 cm. The log underneath had been chopped/worked so that the overlapping log would fit snuggly and evenly on top. At the opposite, shed end of the foundation, the northwestern sill log overlapped the other two sill logs.

Coldfoot 1 shed-room details: floor boards, doorway, and depression: All wood illustrated inside the foundation sill logs in the northernwestern-most "shed" room (Figure B.1) are some type of flat, prepared lumber. Their general poor state of preservation prevented their being distinguished as either milled or hand-hewn. Also, their poor preservation made indistinguishable into individual boards the contiguous section of boards see in the figure. Most of the floor boards in this area turned out to be very thin wood (ca. 1 cm), leading one to suspect that they might have been packing crate boards laid down flat. Removal of these boards revealed no artifacts beneath them, and only one joist-like piece of similarly-flat wood, onto which several of these floor boards were nailed. Floor boards were constructed from a patchwork of different types and sizes of flat wood, laid down neatly to cover the ground surface.

The northernwestern-most "shed" room also had an apparent doorway depression in one of its sill logs (hatched on the sill log in Figure B.1). Wood preservation was overall poor in this area, thus it was indeterminate whether a section of the sill log of the extension of the foundation had been intentionally planed out (as was the case in Coldfoot Features 5 and 7), or merely worn down with repeated foot traffic. There was also no earthen insulation berm piled up outside the sill log at this location (see more on earthen berms, below), which would have impeded traffic into this room.

The shed extension also had a 70 cm diameter bowl-shaped depression ca. 20 cm deep, situated adjacent to and slightly protruding beneath the northwestern sill log. The purpose of the depression is unknown, although it appears to be contemporaneous with the structure since it had numerous items of refuse lining the inside of it (including complete bottles), and a section of a floor board which overlapped its edge had collapsed down onto the upper edge of the depression.

Coldfoot 1 floor joists: Numerous floor joists were uncovered in the foundation. All floor joists were prepared by removing of their bark, being sawn through both ends, and having been "flattened" along their upper sides by sawing, as no adze or axe marks were visible upon inspection. The middle of the three rooms in Coldfoot 1 had an elaborate floor joist system, comprised of nine roughly spaced-out joists spanning between the long axis sill logs. The joist at the northwestern end of these nine logs was actually composed of two separate slightly overlapping logs. All floor joists in this foundation, including those remaining in the southeastern-most room, were sawn flat on their upper surfaces in order to lay down floor boards on top of them. All floor boards in the southern, two main rooms of this feature had been removed in the past, prior to excavation. Many regular wire nails were noted protruding from these floor joists, indicating that the floor must have been rather deteriorated at the time of floor board scavenging. This was also the case with the other floor-scavenged excavated structures in Coldfoot (Coldfoot Features 4, 7, 14; see below). All *in situ* floor joists proceeded slightly underneath the long-axis sill logs. In addition to these joists, three long thin joist bearing pads were uncovered on which these larger floor joists lay, one each next to the sill logs and one down the centerline of the room.

Only two complete and one partial floor joist remained in the southeastern-most room, and of these only one of the complete specimens remained *in situ*. The other two appear to have been disturbed by the scavengers.

Coldfoot 1 possible internal wall and internal door way: Three parallel and adjacent short sections of log were found along the northeastern long-axis wall, at the boundary between the two habitation rooms (Figure B.1). All three were cut straight through at both ends, and were 15 cm in diameter and 50 cm in length. None of the other stray pieces of wood uncovered inside the foundation were cut through intentionally at both ends, instead exhibiting breakage and splintering at one or both ends. If there was a wall separating the two main southern-most rooms of this feature, as seems to be indicated by the distinct floor joist patterns in these two rooms and the separate end-to-end placement of the sill logs and first walls logs (see above), then there would have been a door way between the two rooms. The three short cut logs may correspond to part of the wall separating these two room, particularly that short section situated between a door way and the wall of the cabin (c.f., John Cook 1995, personal communication). If

Coldfoot 1's entry room indicates the location of the doorway into this structure (off-center to the right at the southeastern end of the foundation; see above), then the three short cut logs may indicate that the door between the two main room was similarly located.

Coldfoot 1 subterranean cold storage box: An intact subterranean cold storage box was excavated in the southeastern room of this foundation, which contained two five gallon fuel cans converted into buckets still in place on its wooden plank floor. Although one wall of the box feature had collapsed inward, and other walls's wooden elements were in various states of decay and collapse, we were able to determine the box's original dimensions and the nature of its construction. After excavation, the box measured ca. 1.20 m long, ca. 0.65 m wide, and ca. 0.75 m in depth. Each of the four walls of the box had a backing support of two to three horizontal wood poles (trees or saplings) to which a large section of horizontal boards (conforming to the dimensions above) were nailed. This boarding consisted of wood 2-3 cm thick, and formed the main support structure of the box. We were unsure during excavation if this boarding consisted of one large sheet of wood, or of several boards slotted together in an undetermined manner.

Thinner "paneling" ca. 1 cm thick was nailed onto the inner face of the box. The orientation and individual dimensions of this paneling varied, and seemed to illustrate and eclectic construction pattern. Some of it was vertically nailed onto the boards, others apparently nailed on horizontally, and there were cases where some of the paneling overlapped, sometimes the grain of another board. Large sections of construction or building paper covered sections of the inner paneling, and because of the presence of abundant fragments of this material throughout the fill of the box, the entire inner surface was likely covered with this substance.

The floor of the box consisted of neatly laid, parallel, and thin (ca. 1 cm thick) wooden boards, whose individual dimensions were not discernible owing to poor preservation. As above, two modified five-gallon rectangular fuel cans lay upon the wooden floor of this box. One, upright in one corner, has its crimped-on metal top removed and had a homemade wire handle still in situ threaded through two hand-punched holes in opposite sides of the upper edge of the can. Situated in another corner of the subterranean box, the other five-gallon fuel can also had its top panel removed, and was found fallen onto its side. No other artifacts lay directly on top of the wooden floor.

Some time apparently passed between initial abandonment and later artifactual deposition, for enough time had passed for a ca. 10 cm thick silty sand layer to cover the floor of the box before other artifacts entered it. This situation is clearly discernible, with most of this filling undisturbed by later filling or collapse. Artifacts lay directly on top of this 10 cm thick fill, and not within it. The three wall profiles drawn in the field all illustrate this fill layer and artifacts (situated next to walls) on top of it.

Coldfoot 1 insulation earthen berms: Coldfoot 1 had distinct berms of earth that had been piled up next to and covered the outside faces of the foundation sill log and first walls logs. In this manner, the berms lined the outside of, and paralleled, the long axes of the foundation. The berms associated with this feature vary in depth or height, ranging between 25-32 cm above the adjacent outside-foundation ground surface. Most of the berms are only ca. 30 cm wide, and slope off quickly away from the foundation to the surrounding surface elevation. The berms were only associated alongside the long axes of this feature, and only those sections associated with the two main southern-most rooms, not the "shed" room at the northwestern end of the foundation.

Earthen berms were piled up against the outside lower 1-2 logs of a cabin's foundation, serving to insulate it during the cold winter months. I have seen dozens of photos of cabins dating to the late-nineteenth and early-twentieth centuries illustrating this technique, which is still found around the foundations of old cabins in contemporary Wiseman.

All of the foundation outlines located at Coldfoot, Tofty, and Wiseman had similar berms piled up around the foundation sill logs, and are the main reason why structural foundations at these site have been identified. Owing to photographic and other documentary sources regarding Coldfoot, it is suspected that other foundations once existed in Coldfoot's presently delineated site limits. However, without the earthen berms to indicate their presence, they are not likely to be detected without a systematic shovel-testing and/or metal detector surveys.

Coldfoot 1 sheet metal used in construction: Several stacked sheets or side panels of five gallon rectangular fuel cans were noted on top of the berm at the southern corner of this foundation. Also found were several large sheared sections of sheet metal inside of the foundation. All of these artifacts exhibited nail holes, and represent likely roof shingles and/or wall siding. Many older cabins in Alaska exhibit slightly overlapping rows of fuel-can panel "shingles" nailed onto their roofs. Empty fuel cans represented an often abundant, cheap, easily malleable source of light-weight metal sheeting at many Alaskan settlements, whether mining-related or not. One of the two partially standing structures at Coldfoot is covered in this manner (Feature 24; see Figure 2.2, Coldfoot site map), as are several of the old cabins in Wiseman. I have come across numerous examples of this trait throughout interior Alaska during archaeological reconnaissance, as well as in many historic photographs of Alaskan cabins.

Coldfoot 1 window placement: While it is acknowledged that window pane fragments easily become distributed about the floors and foundations of cabins and other structures upon abandonment, it is assumed for our purposes here that clusters of window glass correlate with past window locations set into walls. Apart from small numbers of pane fragments were found within many excavation units inside of the Coldfoot 1 foundation, only one apparent grouping of pane fragments was noted in the data. This group is located inside and adjacent to the center of the northeastern long-axis wall of the middle room.

COLDFOOT FEATURE 4

Coldfoot 4 dimensions and basic outline: The Coldfoot 4 foundation measured only 2.94 x 3.53 m across the insides of its sill logs, providing a floor area of only 10.41

m^2 (Figure B.2). The excavated foundation remains comprised four sill logs, two sill log pads, five floor joists, thirteen joist bearing pads, and a small board-lined subterranean cold storage box. The wood illustrated in Figure B.2 are the only wood uncovered during the foundation's excavation.

Coldfoot 4 subterranean cold storage box: The subterranean box feature measured 48.3 cm in length and width, and 30.5 cm in depth. The box construction consisted of 48.3 cm long milled lumber boards, ¾" and 1" thick, and of variable widths. Nine boards were used in its side-wall construction, all horizontal, with three boards to one side and two each to the remaining sides. These four sides were nailed together in the following manner: the northeastern and southwestern walls were made to overlap the other two walls edges, so they were flush all around. A single wire nail was protruding out of the middle top edge of the northwestern wall of this box.

Coldfoot 4 sill and joist logs: The logs of the foundation (Figure B.2) were well-prepared: none exhibited bark, all were sawn through at both ends; all of the joists's upper sides were flattened by sawing off a section of the log lengthwise, as was the upper surface of the northeastern and northwestern sill logs, and the northern-most part of the southwestern sill log. The other half of this latter log and the entire southeastern sill remained full-rounded logs. The southeast sill log and the southern-most joists had nails protruding from them, which, as like Coldfoot Feature 1 above, indicates an advanced deteriorated floor board condition at the time of their removal. The interesting aspect of nails protruding out of the top of the southeastern sill log will be discussed below, when discussing the "platform" hypothesis for this foundation. All of the ends of floor joists either butt up against their respective (northeast and southwest) sill logs, or else only have a small gap of $\leq$ 2 cm. Elevations of all the mid-points and ends points of all joists and sills indicate the upper surfaces of all of these foundation pieces were relatively co-eval or level, all within a few centimeters of each other. The southeastern and northwestern sills are peculiar (relative to other excavated structural foundations) in that they seem to be extensions of the floor joist system, in that they butt up against the inner sides of the two

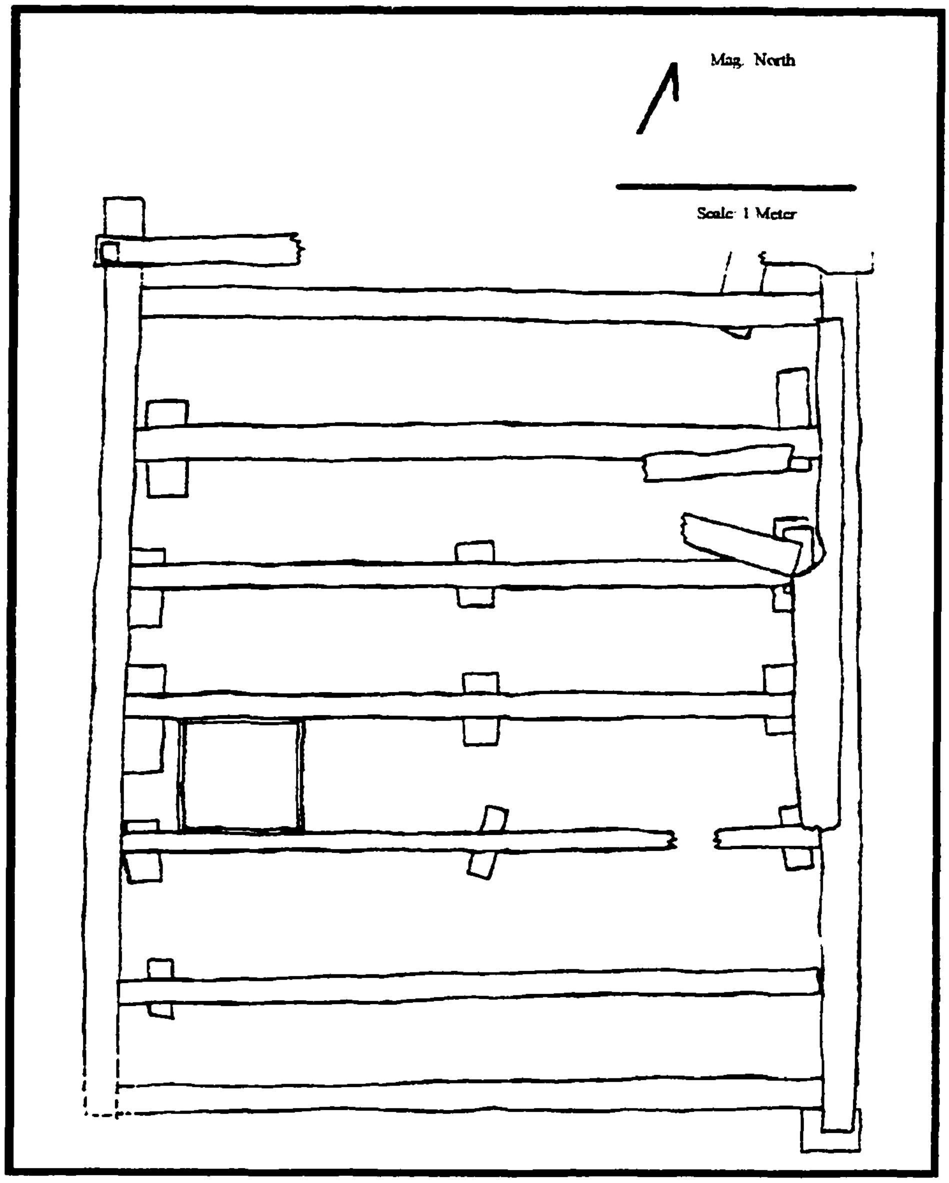

Figure B.2 Coldfoot Feature 4, excavated foundation's remaining structural elements.

long axis sills. This too will be discussed further below. The diameters of all joists and sills are small, relative to other foundations. The diameters of the five joists range between 8-12 cm, those of the two short axis sills are 11-13 cm, while those of the two long axis sills are 12-15.5 cm.

Coldfoot 4 sill and joist bearing pads: In addition to joists and sills, thirteen joist bearing pads and two sill pads complete the foundation assemblage. One of the joist pads was a flat dimensional board 1" thick. All of the other sill and foundation pads were sawn off linear sections of round logs, probably corresponding to the upper lengthwise sections of logs that were sawn off of the sills and joists to make them flat on top. These "extra" wood pieces, ranging between 2.5-4.0 cm thick, were apparently then sawn into small sections, and placed flat-side down underneath the joists and pads as illustrated in Figure B.2. These pads appear to serve the purpose mostly of elevating appropriate portions of joists and sills in order to make the entire foundation the same circa level. To further illustrate this, two pads are used one atop the other. While this makes sense for floor joists in order to make the overlaying floor as level as possible, it is interesting that this technique was also done to some foundation sills, as well.

Coldfoot 4 other wooden elements: In addition to these *in situ* wood elements, we uncovered a few other scattered wood sections. These include possible first upper wall logs along both the northeastern and northwestern sills, this latter consisting of two fragments, apparently displaced. It is interesting that these two latter fragments which seem to "appropriately" criss-cross the northern and western corners of the foundation, are not notched as one might expect them to be, nor are the underlying logs beneath them. This possibility contradicts their "first upper wall log" status, as they may simply be fortuitously-placed log fragments. I also doubt that they are fragments of the northwest sill log (which would make the interpretation of the adjacent log as "sill" incorrect), for the two fragments noticeably decline in elevation as they proceed away from their overlaps, so much so that there would likely have been an empty 5-10 cm gap beneath the log if we were to connect them together across space. This situation could hardly serve the purpose of a sill log of a structural foundation! In addition to these fragments, one other log fragment and one probable floor board piece were found within the foundation confines. This latter piece, itself slightly overlapping the double-joist pad along the northeastern sill (see Figure B.2), was 1.9 cm (¾") thick, and 12 cm (4 ¾") wide, and was sawn through at one end and broken at other.

Coldfoot 4 insulation earthen berms, and door and window placement: Coldfoot 4 had the lowest earthen berms of all such identified features located at either Coldfoot or Tofty. As with all other foundations, they are situated just outside of, alongside, and on top of the outer faces of the sill logs. Coldfoot 4's berms ranged only 6-12 cm higher than adjacent ground surface outside the foundation, and were only about 15-20 cm wide. They were situated alongside all sills except the southeastern sill. This leads me to suspect that this wall contained the entrance to this structure. The highest concentration of window glass (n=9 of 20 fragments in this feature) was also situated along this southeast wall, corresponding to its southern-most part (i.e., bottom of Figure B.2, off-center to the left). Most of the remainder of window glass in this foundation (n=10) was evenly spread out in adjacent excavation units. Assuming this wall contained the door, and assuming the window glass concentration marked the location of a window in that wall, then the door to this structure would have been located along the northern part of this southeastern sill (i.e., bottom of Figure B.2, off-center to the right).

Coldfoot 4 cultural gravel pad and basic stratigraphy: An interesting characteristic of this foundation, relative to all others excavated, was a culturally-formed platform of river cobbles and gravel that completely filled in the open spaces between the wooden floor joists, from the base of the joists up to their tops to where the floorboards would have been lain (Figure B.3, left, Level 3). This cultural-fill level was not present in the areas between the southeastern-most joist and the southeastern sill log. Test pits dug around this foundation failed to show this cultural layer of gravel and cobbles high in their profiles (Figure B.3, right), instead locating the river-deposited source of this material deeper in the profile. The actual source of the cultural gravel Level 3 inside of the foundation probably came from the digging of Coldfoot 6, a rectangular culturally-dug refuse pit located only 1-2 m. west of Coldfoot 4 (see Figure 2.2, Coldfoot site map). This trash pit was dug through overlying silts and into the river cobbles and gravel. The basic profile of river-lain layers of silts and fine sands underlain by waterworn gravel and cobbles were noted again and again in test pits excavated throughout the Coldfoot townsite.

The vast majority of artifacts excavated in the foundation were located at the boundary between Level 2 (silty fine sand) and this gravelly Level 3 (Figure B.3, left). The cultural gravel Layer 3 contained few artifacts (9 wire nails; 1 fragment each of paper, flat metal, and window glass; 1 circular iron keep ring), and all these were found within a couple of centimeters of this Level 2/Level 3 boundary. The base of the joist pads and some section of the floor joists are found directly at the bottom of this gravel Layer 3, both laying upon undisturbed sterile silt (Level 4). The boundary of this sterile silt was demarcated by a thin (ca. 0.5 cm) mottled brown organic layer, likely corresponding to the old forest surface upon which the foundation was originally built.

<u>Coldfoot 4 foundation as a platform for an ephemeral structure?:</u> As opposed to supporting a full cabin, Coldfoot 4 may instead represent the base of a <u>platform</u> upon which a more ephemeral type of structure or shelter was erected, such as a wall tent or else a low-wall and wall tent combination. The evidence presented is only suggestive, and needs to be corroborated against comparative data. Observations that suggest that the Coldfoot 4 foundation may not have supported a full cabin include (see Figure B.3 for details described below):

(1) the sill logs are relatively thin at only 11-15.5 cm, whereas sill logs in other excavated structures at Coldfoot have diameters 20-30 cm. It is questionable whether this diameter of log can support an entire wall;

(2) the foundation sill pads are seemingly used to elevate portions of some sills to the same general height above ground surface as the rest of the sills and floor joists. There is no necessary reason to correlate the heights of the sill system with the floor joist system

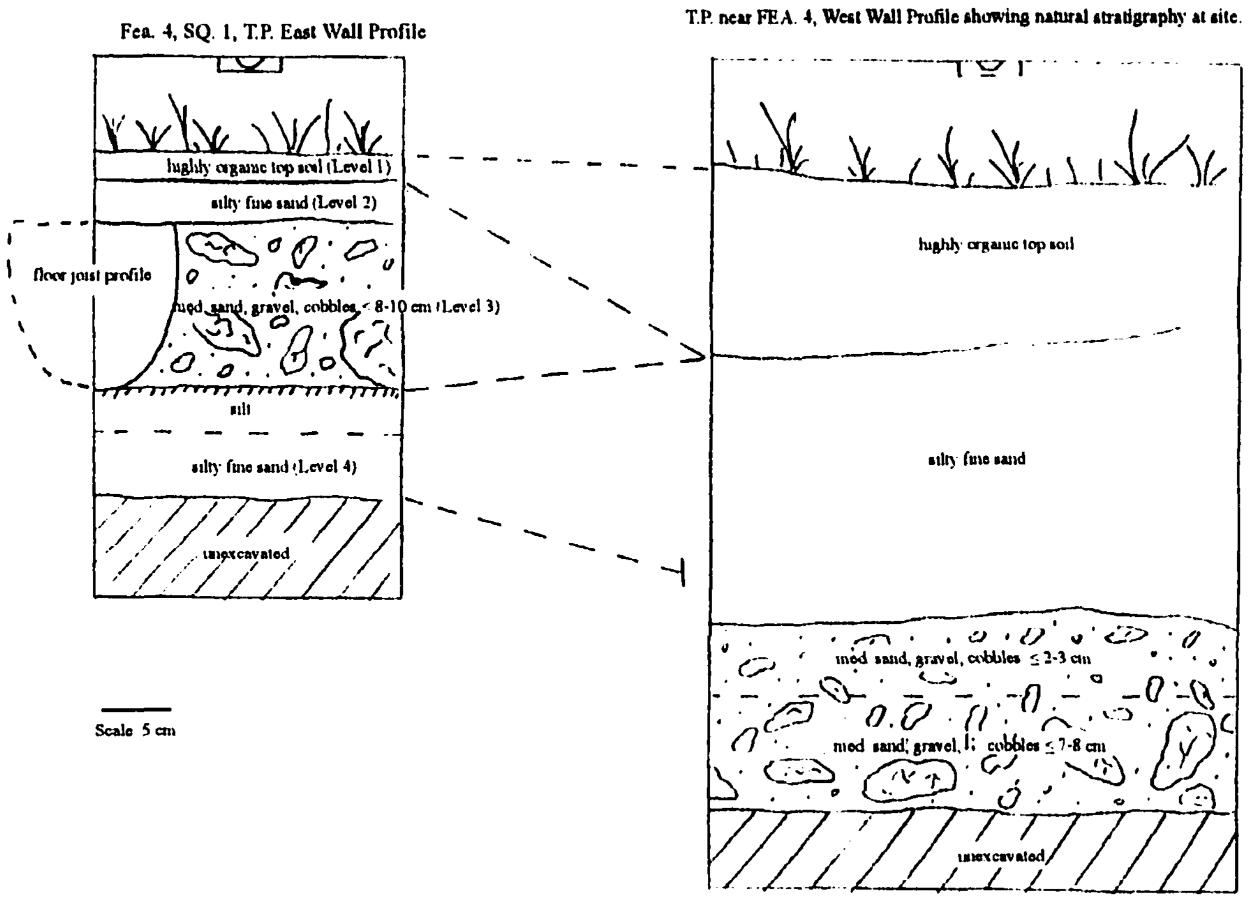

Figure B.3 Contrast of cultural stratigraphy profile inside of the Coldfoot 4 foundation with the natural stratigraphy outside of the foundation.

<u>unless</u> the floor boards were to extend across and cover all joists <u>and</u> sills at the same time. If this scenario is accurate, there technically are no "sill" logs in this foundation, only joists on which to lay a platform of floor boards;

(3) the sill logs do <u>not</u> immediately begin an overlapping criss-cross pattern of notched logs typical of other log cabins. Instead, the short axis sills butt up against the inner sides of the long axis sills, a continuation of the pattern witnessed by the five "true" floor joists;

(4) nails protrude from the top of the southeastern sill log like those seen in most of the floor joists, leading me to suspect that floor boards too were nailed directly onto the upper sides of this sill;

(5) the berms of earth around the feature correspond only to the top height of the sill logs. Berms around other excavated features were piled much higher, typically corresponding in height to a sill <u>and</u> at least one wall log; and

(6) a relatively high number (n=8) of large brass canvas cover or wall tent grommets with tarp fragments still adhering were found inside this foundation, Coldfoot 4. While seemingly few in number, they stand out amongst Coldfoot 4's 300 artifacts when seen relative to the other excavated foundations, which had between 250%-1660% more artifacts. For instance, Wiseman 1 only had three of these artifacts, Coldfoot 14 had eight, and all of the others foundations produced one each.

<u>Coldfoot 4 sheet metal used in construction?</u>: This "platform" hypothesis, as above, is presented less as a definitive interpretation of this feature and more as a hypothesis for future analysis. Admittedly, one form of data that does not support the platform hypothesis are the presence inside of the associated trash pit Coldfoot 6 of hand cut/sheared side and top panels of five-gallon rectangular fuel cans, as well as similarly-sized rectangular and square sections of sheet metal and other metal canisters. Fourteen examples of these were found stacked within the refuse of this refuse pit, some used (i.e., nail holes present, punched through them) and some apparently unused. No examples of this type of artifact were found within the Coldfoot 4 foundation.

Coldfoot 4 scavenger's/looter's spoil pile: Finally, an apparent "spoil" pile of silt, sand, and small gravel sediment forming a roughly 75 cm diameter pile was uncovered inside of the foundation's confines, just inside the southwestern sill log, north of the subterranean box feature. This sediment pile was located on top of the rich, thin upper organic sod layer (Level 1) that topped each excavation unit's profile. This pile of sediment is interpreted as deriving from a specific looting or scavenging event in the adjacent Coldfoot 6 cultural refuse pit, located 1-2 m. to the west. Coldfoot 6, a roughly 2.60 x 1.35 m. rectangular pit, contained a thick deposit of material refuse (ca. 30-40 cm) found intermixed in frozen silt and fine sand, with some gravel inclusions. It is interpreted that a looting event in the not-too-distant past resulted in the scattering of cans outside of this feature, found surrounding it in all directions, and the deposition of this small pile of sediment inside of the adjacent Coldfoot 4 foundation. That this spoil pile contained unique artifacts similar to those found in Coldfoot 6 (e.g., distinctive broken clock hardware) lends credence to this interpretation.

COLDFOOT FEATURE 5

Coldfoot 5 dimensions, and interior roof and wall collapse: The Coldfoot 5 foundation measured on the inside of the sill logs 3.14 x. 3.13 m, thus having a floor area of only 9.83 m^2. It was the only excavated structure in Coldfoot that contained any appreciable quantity of collapsed wall and roof logs. This mass of broken log fragments, several series of which were of the same size and lying next to and parallel to one another, was all mapped (not illustrated here; see Figure B.4), and had many nails protruding from them. One small complete structural element in this collapsed fill corresponds to the uppermost log located on either side of the ridge pole at the apex of the "front" and "back" sides of a log cabin. Despite the amount of collapsed structural wood present inside the confines of this foundation, especially when contrasted with the overall lack of structural elements in other excavated foundations, there is still not enough present to

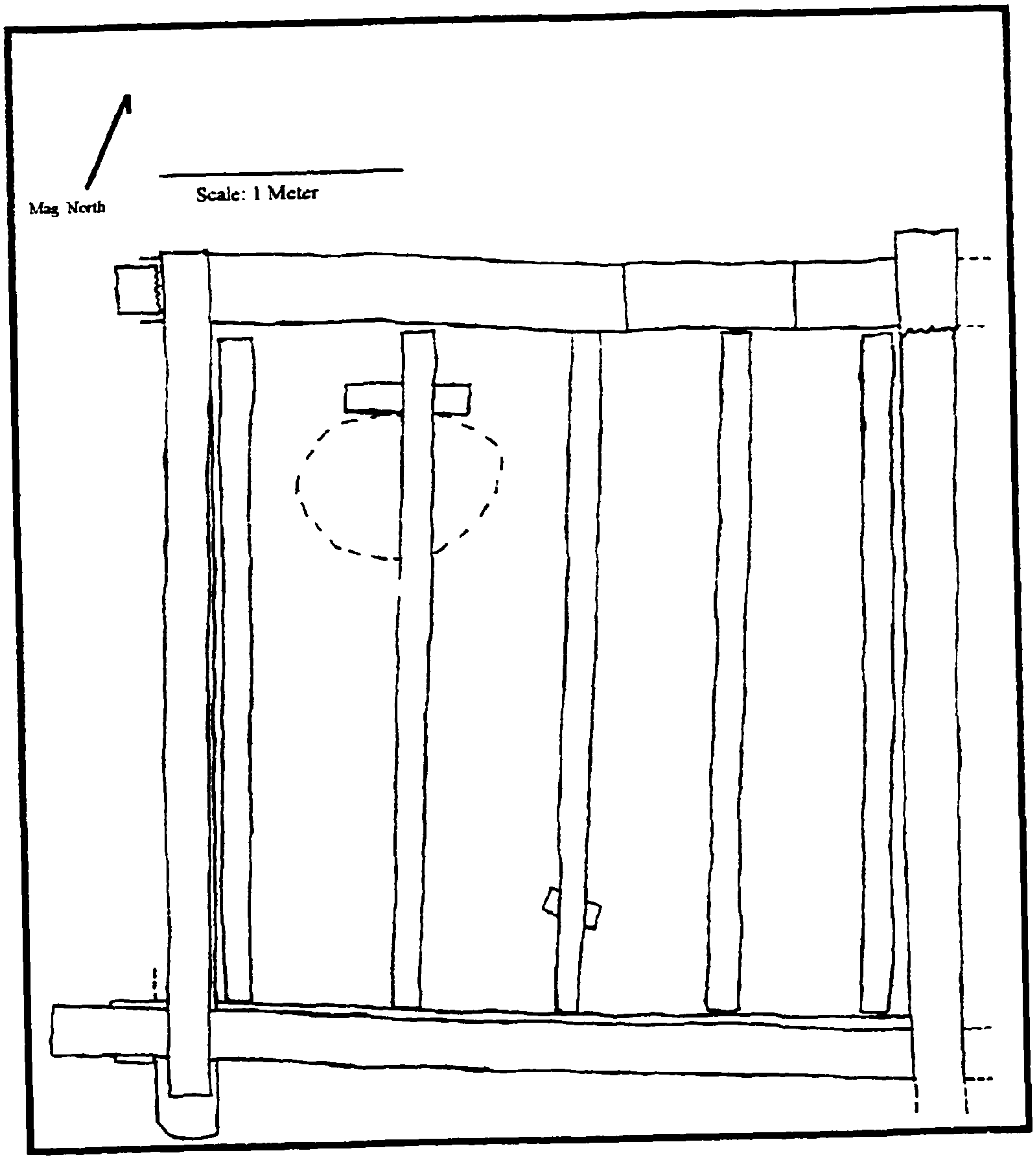

Figure B.4 Coldfoot Feature 5, excavated foundation's basal structural elements. Overlying floor boards and roof/wall collapse are not illustrated.

reconstruct an entire cabin. It appears that at least part of this cabin's structural elements had been scavenged, with the remainder having been either knocked down or else collapsed in place into the foundation. It is worth noting that the northern wall, in addition to the *in situ* sill and first wall logs, also had at least three more of its wall logs in place which are now collapsed into the interior of the foundation. These were exposed where they fell, parallel and side-by-side just inside the northern sill log.

Coldfoot 5 lack of bark: The vast majority of wood in this fill did not have bark adhering to it, only 2 of dozens, and neither did any of the four *in situ* sill logs and first wall logs that were still in place above each of these sills. After careful inspection, none of the sills or first wall logs were noted as flattened by sawing or otherwise on their upper surfaces. However, the western and eastern sill logs were flattened all along their interior sides by sawing. Likewise, the southern first wall log was similarly flattened on its inside face. I have recorded similar flattening of the interior of wall logs of log cabins, but not their outside surfaces, at other archaeological sites in interior Alaska.

Coldfoot 5 complete *in situ* wooden floor: After removal of all of the roof and/or ceiling fill, an entire *in situ* floor of nineteen hand-hewn floorboards was uncovered. This feature represents the only excavated structure to have a remaining complete or even near-complete floor. None of these floor boards were tongue-and-groove; they were simply laid closely side-by-side and nailed down into the five floor joists laid underneath them. The floor boards were laid east-west, and all abutted (or nearly so) the east and west sill logs. Seven of the boards were ¾" (1.9 cm) thick, seven were 7/8" (2.2 cm) thick, and the rest were 1" (2.54 cm) thick. They had variable widths, ranging between 5 ½" (13.95 cm) and 9" (30 cm). Variable numbers of nails were used to nail down each floor board to the joists beneath, depending upon the width of the board. Some minor buckling of a few of the floor boards was noted, resulting in bit of local overlap. This was interpreted as resulting from frost heave by excavators.

Coldfoot 5 floor joists, joist pads, stove location, and original ground surface: Removal of the floorboards revealed five evenly-spaced floor joists which were lain perpendicular to the floor boards, two joist bearing pads, and a distinct concentration of charcoal flecks and ashy soil that likely indicates the former location of the stove (Figure B.4). All of the floor joists were sawn through at their ends, and most butted up against or came within 2 cm of the north and south sill logs, although one was 6 cm away. The two joists pads were 3.5 cm and 4.5 cm thick; unfortunately, it was not noted if they were sawn log fragments or dimensional lumber.

All joists were sawn flat on top to evenly receive the floor boards, and they (and the two joist bearing pads) lay directly upon Level 4, a thin (2-3 cm) dark loamy soil that lay immediately beneath the floor boards. This layer likely corresponds to the original ground surface upon which the foundation was built. Directly on top and pressed into this layer were (as above) random flecks of charcoal, as well as numerous small wood chips (likely correlating to building activities), as well as 1202 artifacts, or 77% of the total number artifacts collected from the confines of this foundation. Again, these items were all found directly on top of this thin layer, and were <u>not</u> found within it. This same original ground surface was uncovered on the outside of the foundation when the southwest corner of this structure was completely exposed by removing the thick earthen berms that covered this corner. The original ground surface exposed by this effort was associated with a thick layer of wood chips possibly relating to the original construction of the cabin, as well as some charcoal flecks.

<u>Coldfoot 5 sill and wall logs corner notching:</u> This corner berm-removal effort revealed a classic criss-cross overlapping of the two sill logs and each of the first upper wall logs. As seen from this exposure, we can tell that the south and north sill logs were laid down first. Near both ends of each of these logs, dorsal saddle notches were chopped into their upper surfaces with an axe. The east and west sills were then laid down over these sills, fitting into the notches in the logs beneath them. These sills then had dorsal saddle notches chopped in *them*, into which the first wall logs of the south and north walls were placed. The sills and first wall logs indicate most tree felling was done by means of a

saw, although the end of one log seen in the southwest corner exposure indicates that it might have been chopped down with an axe.

Coldfoot 5 door way: This foundation also had a notch which was sawn and planed out of its northern sill log, which indicates the placement of the door (Figure B.4). The door notch was 72 cm wide, and was sawn straight down 11 cm (into this 32 cm diameter log) at both ends, and then planed out in between.

Coldfoot 5 insulation earthen berms: Thick berms surround most of the outside of this foundation, piled up against the foundation and overflowing the tops of the first wall logs, ca. 50-55 cm in height. They are only about 20 cm wide before sloping away from the foundation at ca. 45° angles. They were highest around the south, east, and west walls, and less so in front of the north sill where they are only ca. 20 cm in height. No berm was apparent in front of the door notch.

Coldfoot 5 window placement: Finally, of the 41 window glass fragments found on and above the floor boards, 30 were located in excavation units along the inside of the middle of the western wall. Ten of the remaining eleven fragments were found along the inside of the western half of the southern wall. If window glass sherds can be assumed to indicate window placement, it appears that at least one window was located in the middle of the western wall, and possibly another in the southern wall, off-center to the westward.

COLDFOOT FEATURE 7

Coldfoot 7 dimensions and basic outline: The Feature 7 foundation at Coldfoot had internal measurements of 4.39 x 5.42 m, for a potential floor area of 23.8 m^2. Upon excavation, the foundation revealed four *in situ* sill logs, fragments of five *in situ* floor boards (in the southwest corner of the foundation), a series of *in situ* floor joists oriented east-west, and the displaced first wall logs of the eastern and western walls, found laying directly upon the floor joists (Figure B.5). In addition, several other small broken

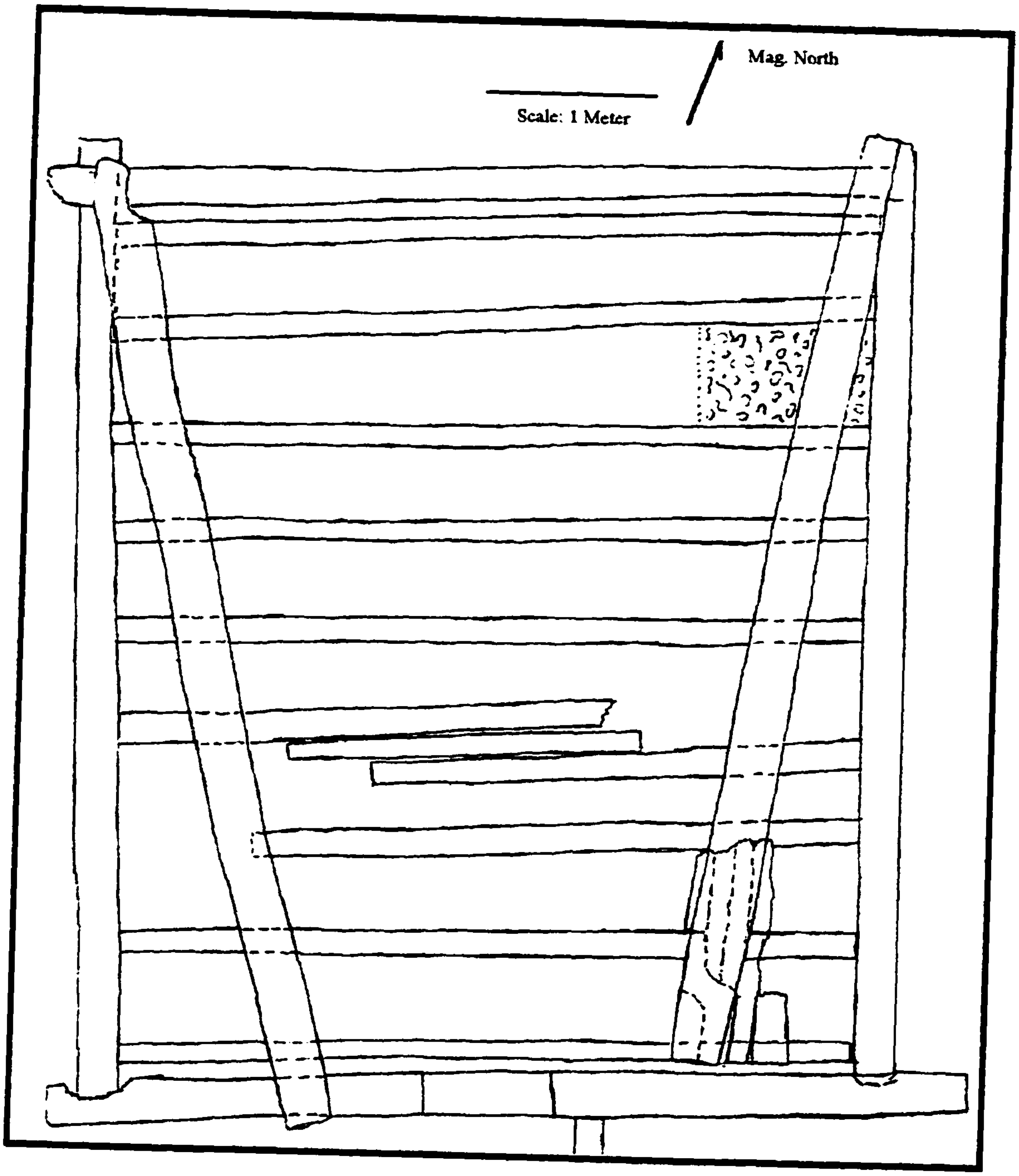

Figure B.5 Coldfoot Feature 7, excavated foundation's remaining structural elements.

fragments of logs and probable floor boards were uncovered during excavation scattered within the foundation. None of these scattered fragments are presented in Figure B.5.

Coldfoot 7 floor joists, sill logs, and corner notching: Seven of the joists were "complete," in that they completely spanned from sill log to sill log, in most cases abutting directly up against them. One joist (the third one northward) spanned most of the way between the sills, but stopped 84 cm from the western sill. Owing to the extremely poor state of preservation of all joists in this foundation, it could not be determined if this missing section was broken off and scavenged, or else was never originally present. Three partial joist sections, none long enough to completely span from sill to sill, appear to function together as one "complete" joist. The possibility exists that the northern-most of these three adjacent sections is broken off at its eastern end. However, it is not credible that the "middle" section of these three is the broken and displaced section of either of the other two, for it is simply too long.

Although in very poor shape, all of the joists appear to be flattened on their upper surfaces, presumably by sawing as identified in other excavated Coldfoot foundations. The fact that they are all wider than they are thick (height) supports this, for if they were round logs their height and width (i.e., diameter) would likely be the same. Series of nails protruded out of the tops of all joists along their entire lengths, indicating that the floor boards were very deteriorated when they were removed by scavengers.

Based upon the notching and overlap of the sill logs and the two displaced first wall logs, the following construction sequence is proposed. First, the east and west sill logs were laid down. Then, the northern and southern sills were laid down, overlapping the first two. The overlap of the northern log proceeded in a straightforward manner, with overlapping log sections extending beyond the actual corner. Although badly deteriorated, it appears that the ventral side of the northern sill being laid down over the eastern and western sills had a saddle notch chopped out of it.

The southern sill log's notching, however, presents a unique scenario. This log barely overlaps both the western and eastern sills. As such, the southern sill's ventral saddle notching does not appear to be finished. Instead, the notching is only partial and is present only where the eastern and western sills did in fact partially proceed the southern sill. In addition, this notching continues up to the inner face of the sill log on both ends, creating a distinctive indentation when viewed from the top (Figure B.5). That this south sill log is not partially displaced is seen by the perfectly horizontal character of the door way notch that is sawn and planed out of this log (discussed further below). Three of the ends of the first (displaced) wall logs within the foundation were too deteriorated to determine their notching. However, the northern end of the western sill evinced ventral saddle notching, thus conforming to the pattern presented above.

Coldfoot 7 floor boards: A small section of five *in situ* floor boards was located underneath and protruding from under one of the displaced first wall logs, in the southeastern corner of the foundation. These boards were all ca. 1 cm thick, but were variable in width, measuring 9, 10, 12, 20, and 20 cm each. As seen in the subsequent discussion on archaeological abandonment (Chapter 3), many small artifacts lay directly upon and underneath this small floor board section that lay directly under the wall log. In a sense, the log "shielded" the artifacts from further displacement by the wood scavengers.

Coldfoot 7 door way, and insulation earthen berms: A notched door way was sawn into and planed out of the central portion of the southern sill log, in a manner identical to the one witnessed in Coldfoot 5. It is 80 cm long, and is cut 10-12 cm (precise measurements not possible owing to deterioration) into this 28 cm diameter sill log. Sizable berms of earth were piled up along and outside of the east, west, and north walls, but not along the south wall where the door way notch is located. The berms were 30-45 cm in height, and 25-30 cm wide before rapidly declining to the ground surface beyond the foundation.

Coldfoot 7 gravel stove pad: In addition, a raised area of gravel and cobble fill about 1 m long was located between two of the joists. This raised area or "pad" was 10 cm thick, from the base to the tops of the adjacent joists, and was comprised of gravel and silty medium-grained sand, with water-worn cobble inclusions up to 10 cm long. It was sterile of artifacts, and differed significantly from matrix of comparable depth in all other areas of the foundations. This feature possibly represents a resting pad for a stove, and is similar to above-floor raised box features filled with gravel as seen in contemporary abandoned cabins in Wiseman. The source for this gravel and cobble matrix might be a 2 x 1 m oval depression located two meters north of the foundation. Note again that water-worn gravel and cobbles underlie silts and sands throughout the townsite. No refuse is located in or around this oval depression, and a test pit into its base also failed to uncover any artifactual material. What this test pit also reveals is that this oval depression is lacking a layer of silts and fine sands that overlay the gravel and cobbles in several other test pits placed outside and around this feature (10-35 cm thick). This depression might, therefore, have served as a source for the silt and sand matrix comprising the insulation berm around the Coldfoot 7 foundation, and/or as a source for gravel for the "stove" pad.

Coldfoot 7 sheet metal use, and window placement: Only a single section of hand-sheared sheet metal exhibiting nail holes was found within the excavation. The extent of metal sheets used in the construction of this feature, therefore, remains unknown. Finally, unlike other foundations, small numbers of window glass fragments were located in most of the excavation units of this foundation (N=95). Dense groups of this material, however, are noted in excavation units inside and adjacent to the middle of the east sill log (n=24, 25%). In addition, 41 pieces (43%) were located in the four excavation units comprising the southwestern corner of the foundation, and 11 pieces (12%) were located just inside of the southern sill log, from the west of the door notch to the southwest corner. Once again, assuming window glass fragments correlate to window location, it seems that one window was located in the middle of the east wall, and at least one other window was located in the south wall, most likely to the east of the door way.

COLDFOOT FEATURE 14

Coldfoot 14 dimensions and basic outline: The Coldfoot 14 foundation had internal dimensions of 4.52 x 6.13 m, providing a potential floor area of 27.7 m^2 (Figure B.6). This foundation was immediately adjacent to and shared a berm with another foundation to the westward (see Figure 2.2, Coldfoot site map). Although Coldfoot 14 and the adjacent Coldfoot 15 might together represent a two-roomed structure, this is likely not the case because of the shared earthen berm situated between the two foundations. Instead, Coldfoot 14 was probably a habitation room with an attached (though sizable) shed structure (Coldfoot 15). Coldfoot 14 was also the last feature excavated during the 1995 field season, and as a result all aspects of the foundation's architectural detail were not thoroughly addressed when the crew had to leave the site.

Coldfoot 14 sill and wall logs: This foundation contained complete though deteriorated *in situ* northern and eastern sill logs, a complete *in situ* eastern first wall log, an apparent *in situ* or slightly displaced north fragment of the western sill or first wall log, and several severely deteriorated probable wall logs along where the south wall would have been located (Figure B.6). The northeast corner indicates that the eastern sill was laid down first, which was overlapped by the northern sill, which in turn was overlapped by the eastern first wall log. Deterioration prevented determination of the type of notching present in the exposed northwest and northeast corners. If the western sill was laid first, then the log fragment mentioned above along the exposed western edge of the foundation is likely a fragment of the western first wall log, and not the sill. The sill was likely not exposed during excavation. The southern sill also remains underneath the very deteriorated wall logs illustrated in Figure B.6.

Coldfoot 14 floor joists: The excavation revealed a series of evenly spaced floor joists. There were originally thirteen joists spanning between the northern and southern sills which, based upon the exposed northern ends of them, abutted up against or within 1-2 cm of the sill log(s). One complete joist immediately adjacent to and abutting the entire

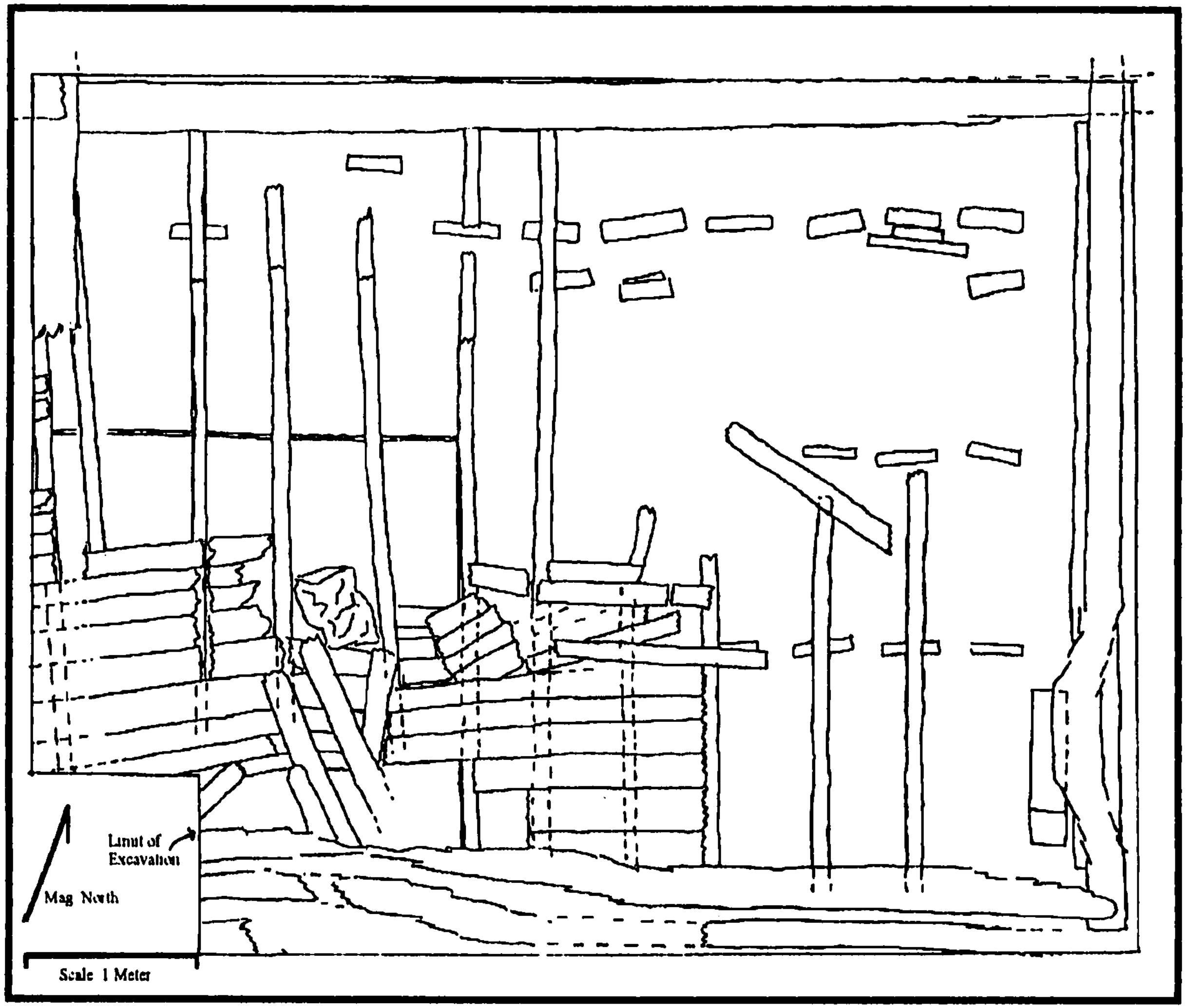

Figure B.6 Coldfoot Feature 14, excavated foundation's remaining structural elements.

edge of the eastern sill, however, was 5 cm and at least 10 cm from the northern and southern sills. One joist had been completely scavenged (second from the east), although its presence was revealed by *in situ* floor joist pads. Of the remaining joists, four had most of their northern halves scavenged, and three more had small sections of their northern sections removed. Only four exposed floor joists were complete, and a fifth (the western-most) likely was complete but was not fully exposed. All joists were fully worked, not only having flat tops from sawing efforts, but most also squared edges as if sawed along their other sides, too. Underneath many of the joists were sawn and prepared joist bearing pads, 22 of which remained *in situ*. Nineteen of these were rectangular sawn board sections, one was a sawn piece of packing crate, and the remaining two were lengthwise sections of logs that had been sawn off of larger logs. These latter two were similar to most of those present in Coldfoot 4 (see above), and were placed flat-side down and curved side up. In addition, there were five more probable joist pads, all displaced and scattered within 4 m^2 of the northwest corner at a slightly higher elevation than the in situ specimens (not illustrated in Figure B.6). Four of these five displaced pads were of the flat-based and rounded-top variety, the type sawn lengthwise off of the faces of larger logs. It is proposed that these five were displaced when joist sections were scavenged from this area of the foundation. The pads dimensions ranged between a packing crate piece only 0.4 cm thick to lengthwise sawn log pieces 5.0 cm thick; most fell in the 2.0-2.2 cm range.

Coldfoot 14 floor boards: This foundation contained both *in situ* sections of floor boards, and floor boards displaced/ collapsed into a large subterranean cold cellar (discussed next). An *in situ* section of floor boards was located immediately adjacent to and east of the cold cellar. These were accompanied by a large section of floor joists and floor boards which had collapsed into the cellar hole, parts of which could be connected to the *in situ* section situated above them. The section inside the cellar had not collapsed flat into it, but instead was sloping into it at various angles, ranging between 45-60°. Associated with this collapsed floor section was a crumpled stove pipe fire safety that had been made from a five-gallon fuel can (Figure B.6). All floor boards were ca. 2 cm thick, all were sawn, none exhibited tongue-and-groove interlocking, and they ranged in width between 11-23 cm. No artifacts were located underneath the section of *in situ* floor boards found above and out of the cold cellar.

Coldfoot 14 subterranean cold storage cellar: This foundation has a large subterranean cold cellar that dominated the southwestern corner of this feature, which in Figure B.5 is illustrated by a thin double line indicating the top side edge of side wall wooden boards of the cellar. The cellar measured horizontally ca. 3 x 3 m and 1.08 m in depth from the top of its side wall boards to its wooden floor. One exposed wall of the cellar consisted of three horizontal planks (indeterminate if locally sawn or imported dimensional lumber) one atop the other, each one 13" (33.02 cm) wide and 3/8" (1 cm) thick. At the base of these was a 9 cm diameter log. No corner post was noted at the northeast corner of this cellar; the planks of its eastern and northern walls coming together flush. The area behind these side wall planks was not investigated, so it was not determined if there was some type of support work behind them.

Owing to a lack of time at the end of the 1995 field season, only a 1.74 x 1.26 m area of the collapsed floor and joist system was removed in the center of the cellar. After removal, additional fill was removed and an intact wooden floor was revealed. Numerous artifacts were retrieved directly on top of this "window" of exposed cellar floor, as is discussed in more detail in the Abandonment Chapter 3. The cellar floor boards were oriented perpendicular to the regular floor boards of the structure (Figure B.6). Measuring only 1.5 cm thick, the cellar floor boards appeared crushed flat as if from excessive wear, or else were originally very thin and fragile. As such, they were difficult to distinguish one from the other. Boards that were able to be differentiated measured 12, 12, 13, 15, 15, and 15 cm wide. This "window" of exposed floor boards was nailed onto three joists underneath them, which were lain perpendicular to the floor boards. The joists measured 9.5, 11, and 11 cm in diameter, and the "middle" joist was situated 50 and 74 cm from the other two. These joists were sunk into a sterile coarse sand and gravel layer, and no artifacts were found underneath the cold cellar's floor boards on top of this gravelly layer.

Coldfoot 14 cultural gravel pad and basic stratigraphy: Similar to Coldfoot 4, this foundation appears to have had a cultural layer of medium-coarse sand and water-worn gravel and small cobbles (up to 10 cm long; gravel consisted of 20-30% of this matrix) laid around its joist system, beneath the floor. This layer, designated Level 3, was found in most of the excavation units, and where present was variable in thickness ranging up to 12 cm thick. It had very few artifacts within it, and those that were present tended to be located in its upper 1-2 centimeters. Most artifacts uncovered were located at the transition between Level 3 and the silt deposits directly above it (Level 2). Underlying Level 3 was more silt layers (Level 4). The reason why it is believed that Level 3 was a cultural fill is twofold. First, all of the *in situ* joist pads were laid directly upon Level 4, and the pads themselves were situated entirely within Level 3. And second, two test pits placed outside of the foundation provided a profile typical of the Coldfoot town site in general: an upper organic rich forest root mat, underlain by silts and silty fine sands, which in turn are underlain by multiple layers of medium and coarse sands and gravels, some with cobble inclusions. Neither external test pit revealed a silt-gravel-silt profile. as was witnessed inside the foundation.

Coldfoot 14 insulating earthen berms, and external foundation pad: Earthen berms of earth were situated along and outside all of the walls and sills of the foundation, differing in height above the adjacent ground surface between 16-39 cm. The material of these berms was of the same parent material as Level 3, discussed above: a sand, gravel, and water-worn cobble matrix. In addition to the regular berms, there was an apparent low rectangular pad built up adjacent south of the southern wall outside of the foundation (see dashed line in Figure 2.2, Coldfoot site map). The pad, raised ca. 12-13 cm above surrounding ground surface and exhibiting a quick drop-off clearly indicating its edges, was about 5.9 m long, parallel to the south wall, and began about 67 cm from the southeast corner. It extended outward from the south wall 2.15 to 2.30 m. Lack of time prevented a full examination of this raised pad area.

Coldfoot 14 sheet metal use, and window placement: Six hand-sheared basal or side panels of five gallon fuel cans with numerous nails through them were uncovered from within the foundation. This suggests an architectural use for this material at this structure, such as roofing or wall covering. Finally, small numbers of window glass fragments were noted in most excavation units, yet only one grouping was apparent in the data. This group, recovered from a unit immediately inside the northern long axis sill log, just off-center to the westward, possibly indicates the location of a window in this wall.

TOFTY FEATURE 1

Tofty 1 brief fire history and dimensions: Oral sources confirm that the Feature 1 foundation at Tofty was a partially standing, partially scavenged structure that burned to the ground in 1969 when an intense forest fire swept through the area. Evidence for this fire was found in the quantity of burnt logs which charred up to 1 cm into the wood, abundant charcoal, charred floorboards, and melted bottle glass and window pane fragments recovered during the excavation. Owing to a lack of time at this site, and to the presence of large piles of (probable) old bulldozer spoil partially covering some of the foundation, the southern sill log and adjacent excavation units were not excavated (Figure B.7). However, complete exposure of the eastern and northern sill and wall logs enabled us to estimate the internal dimensions of this structure at 5.83 x 6.4 m, providing a potential floor area of 37.31 m^2.

Tofty 1 sill logs and wall logs: The excavations uncovered the complete *in situ* sill and first wall logs of the northern wall, and the complete *in situ* eastern sill log. It is interesting that the first wall log of the northern wall did not completely span from corner to corner, attesting to the practice of laying logs side-by-side on top of the sills when dealing with shorter-than-needed logs. In addition, most of the complete *in situ* sill and

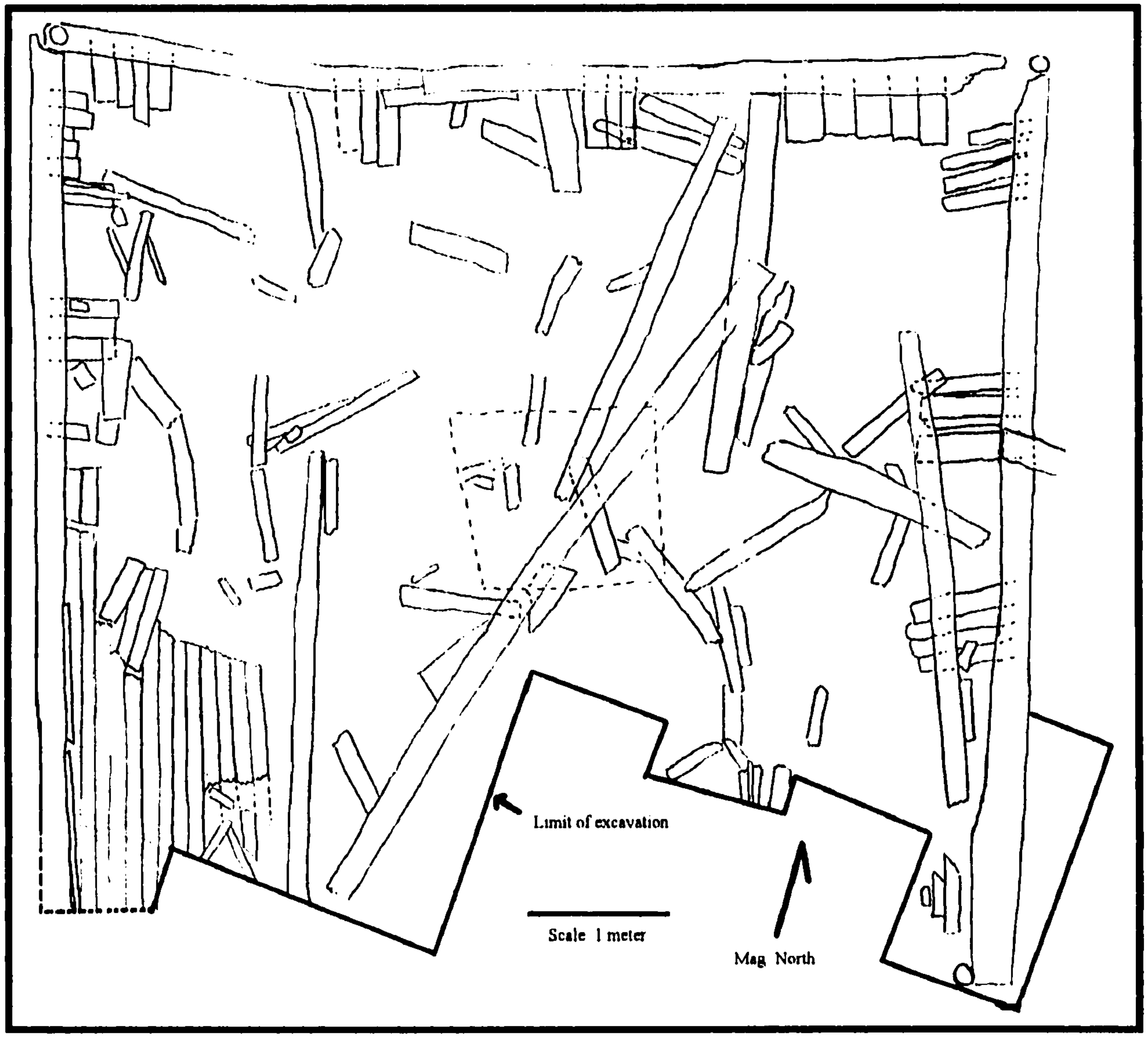

Figure B.7 Tofty Feature 1, excavated foundation's remaining structural elements.

first wall logs of the western wall were uncovered, excepting an estimated 20-25 cm of its southern-most section which was covered over with bulldozer spoil. As above, none of the southern sill or wall logs were unearthed, nor were they apparent in the exposed southeastern corner of the foundation. Again, portions of the uncovered sill pads, and sill and wall logs were partially scorched and charred by fire, a condition that pertains to much of the wood exposed inside this feature. When found, uncharred wood was highly deteriorated, making determination of the presence of bark indeterminable. Although the southern part of the eastern sill appears much broader in diameter at its southern end (Figure B.7), this was due to crushing of the log from above, possibly by a large wheeled or treaded vehicle associated with the spoil piles.

Tofty 1 groups of sill bearing pads: A peculiar aspect of this foundation relative to others excavated at Coldfoot and Wiseman, is the preponderance of groups of sill bearing pads that are evenly spaced out along and perpendicularly placed beneath all three exposed sill logs. These groups consist of three, four, and five logs, projecting from beneath the sill logs. In only one case did a lone log perform this function, located underneath the western sill. These pad logs were extremely variable in size, ranging between 8-22 cm in diameter. In at least a few cases could it be determined that the ends of the sills were chopped with an axe.

While such pads at one end of a foundation log might indicate a leveling exercise, pads situated all along such sills from one corner to the other possibly reflects an attempt to prevent the sinking of the foundation resulting from melting permafrost. In order to evaluate this hypothesis, test pits were dug within the foundation but were halted by permafrost occurring variably 30-65 cm below surface, with the exposed sediments consisting solely of silts and clayey silts. Test pits outside the foundation confirmed this same basic profile, with no gravel or sandy layers, all terminating at permafrost 25-30 cm below present ground surface.

Tofty 1 subterranean cold storage box: The foundation contained a complete subterranean cold cellar box in its center, (Figure B.7, dashed box). The preservation of the wooden walls and floor of this box was excellent, likely owing to its water-saturated condition from being buried in permafrost, as well as its construction from 1" thick boards. All four walls of the box were "bowing" inward at their centers into the box, and in the case of the longer north and south axis walls, had cracked through the boards completely. Along with some interesting artifacts, the box was filled with all manner of charred and decomposing fragments of floor planks and wall/ceiling logs. Upon removal of all contents, the original dimensions and construction techniques of the box could be determined. The longer north and south wall axes were aligned with the long axes of the surrounding foundation, and measured ca. 1.6 m, while the shorter axis walls measured 1.2 m, and slightly varied in height along each wall 38.1 to 44.45 cm, owing to slightly different board widths. Vertical dimensional lumber supports were present in all four corners, measuring 2" x 3 ½", 1 ¾" x 3 ¾", 1 7/8" x 3 ¾", the fourth corner post being unmeasurable. The north wall was constructed or three horizontal boards (3", 6", 8 ½" wide), the east wall by two boards (7 ½" and 8" wide), the west wall by two boards (6" and 9" wide), and the south also by two boards, only one of which could be measured (8" wide). The intact floor of the box spanned between the eastern and western walls, and consisted of five boards measuring between 8" and 10 ¾" wide. All boards used in the box construction were 1" thick, with no tongue-and-grooving.

Tofty 1 floor boards and chopped wood chips: Besides a few broken and scattered fragments of floor boards, a large contiguous floor board section was unearthed in the southwest corner of the foundation. This floor section was highly warped because of the melting of permafrost and concomitant settling or "sinking" of sediments beneath the boards. Thirteen standardized dimensional milled tongue-and-groove boards, all 4" wide and 2 5/8" thick, were oriented with the short axis of the structure. Along with the tongue-and-groove attribute, some of them had regular wire nails driven through at an angle where the two boards touched side-by-side, in order to further bind them. As expected , surface area of much of this floor section was charred (see hashing, Figure B.7). However, other areas were not, mainly those sections lower in elevation due to warping. It seems that warping and partial in-filling of this corner from the associated berm occurred prior to the 1969 fire, as the lower and sediment-covered poertions of this floor board section were shielded from the fire.

Many axe-chopped wood chips were noted immediately beneath the boards, after their removal. Such flat wood chips, some as large as 10-15 cm long, were found scattered throughout many other excavation units in this foundation, and may relate to the original construction of the building prior to the laying down of its floor. No artifacts were found beneath the in situ floor board section.

Tofty 1 lack of floor joists: Contrary to all other excavated features at Coldfoot and Wiseman, no floor joist system was encountered beneath the *in situ* floor boards in the southwestern corner of this foundation, and no charred or uncharred sections of wood conforming to the dimensions of these pieces were found inside the foundation, as approximated from excavated foundations in Coldfoot and Wiseman. While the floor joists may have been removed prior to the fire by wood scavengers, the ca. 3 m length *in situ* floor board section is large enough that there should have been joists found beneath it had they been used in floor construction.

Tofty 1 corner post construction: This structure was also the only one excavated that was clearly of cornerpost construction. Three corners were exposed during excavation, and at all three the bases of vertical logs were found, 10-12 cm in diameter. As such, in the northeast and northwest exposed corners the sill logs and first wall logs did not overlap. The northwest corner was unique in that the eastern sill log exhibited a notch chopped out of its end to partially receive the north sill log (see Figure B.7 details). On top of and at the end of the northern sill in this corner was placed the vertical corner post. A large vertical curved sheet of corrugated sheet metal was still in place in the berm enveloping this outer corner. The north and east sill logs approached but did not quite touch the vertical post in the northeast corner. Piles of nails were found in the northwest and northeast corners, many of them quite large (>5") and all within a 30 cm arc of the confluence of each corner. While many nails are to be expected from a partially standing wooden structure which had burnt down (wire nails formed the largest class of artifacts excavated from this structure, nearly 50% of the total), the number of nails, particularly large nails, were unusually dense in these two corners. For example, 57 nails larger than 5" were uncovered in these tightly circumscribed areas, whereas only 96 more were found throughout the rest of the foundation. Such numbers may attest to the practice of driving spikes through the wall logs and into these corner posts, which have since largely burned away or otherwise removed.

Tofty 1 insulating earthen berms: Earthen berms were piled up against the western wall (30-40 cm high), the north wall (50-60 cm high), and along the northern one-third of the eastern (maximum 25-30 cm high), gradually declining in elevation until disappearing at ground surface. Owing to the mounded bulldozer spoil piles covering the southern sill log, it it was impossible to determine the height or even the original presence of a southern berm. As was typical for the Coldfoot berms described above, the Tofty berms declined quickly at ca. 45° angle until melding with the outer ground surface.

Tofty 1 window placement: While small numbers of window glass were found in over half of the units excavated, two definite concentrations are evident. One occurs just inside of the northern sill log, slightly off-center to the eastward. The other group of glass is located in the middle part of the east sill log. This latter group is particularly abundant, with many large partially melted and melted-together fragments piled up in near vertical positions along both the inner and outer sides of the sill. It appears as if an *in situ* window pane(s) had broken up during the 1969 fire, with fragments falling down on either side of the wall.

Tofty 1 sheet metal used in construction: A final noteworthy architectural characteristic is the presence large sheets of corrugated sheet metal located on top of the berms and around the outside of the foundation, and protruding out of places in the berms. The use of corrugated sheet metal throughout the Western mining scene is well documented, and was prevalent owing to its strength, durability, availability in standard sizes, relatively low cost, and above all its re-usability (Francaviglia 1991:125). The fact that corrugated sheet metal was found around Tofty, with only two possible fragments in the entire Upper Koyukuk excavations found in the excavated Wiseman foundation, likely has more to do with expense of transport than to actual availability.

WISEMAN FEATURE 1

Wiseman 1 dimensions, subterranean cellar, and basic outline: Prior to excavation, the Wiseman foundation was delimited by well defined earthen berms outlining the foundation, which initial measurements put at ca. 8 x 10 m, with long axis oriented slightly west of magnetic north. Along with the berms, a large ca. 4 x 4 m depression ca. 1.0-1.5 m deep (unexcavated) in the northern part of the foundation indicated the presence of a large subterranean cold cellar. Centered east-west, the northern edge of this cellar depression was ca. 1 m from the inner edge of the northern berm, so that its southern edge was ca. 3 m from the southern berm. Standing water and potentially hazardous contemporary material such as paint cans precluded any attempt to excavate the cellar. With only seven scheduled excavation days allowed for this feature, we concentrated our efforts in the southern part of the feature which represented the largest contiguous block of excavation units. While oral data from the present land owners indicate that this structure burned down, no evidence of a fire emerged during excavation. The building was apparently scavenged for wood down to the foundation as was true for most of the Coldfoot foundations discussed above.

Results of the excavation indicate that this feature consists of two rooms: a larger main habitation room, and a "shed" adjoining along the western wall side of this room (Figure B.8). If this is correct, then the main habitation room for this structure would have measured 5.85 x ca. 10 m, with a floor area of 58.5 m^2. If the "shed" idea is incorrect and only one large room is present in this feature, then the floor area would be 7.57 x ca. 10 m, with a floor area of 75.7 m^2. Details of the adjoining shed and the "bench"-like feature are discussed in more detail, below.

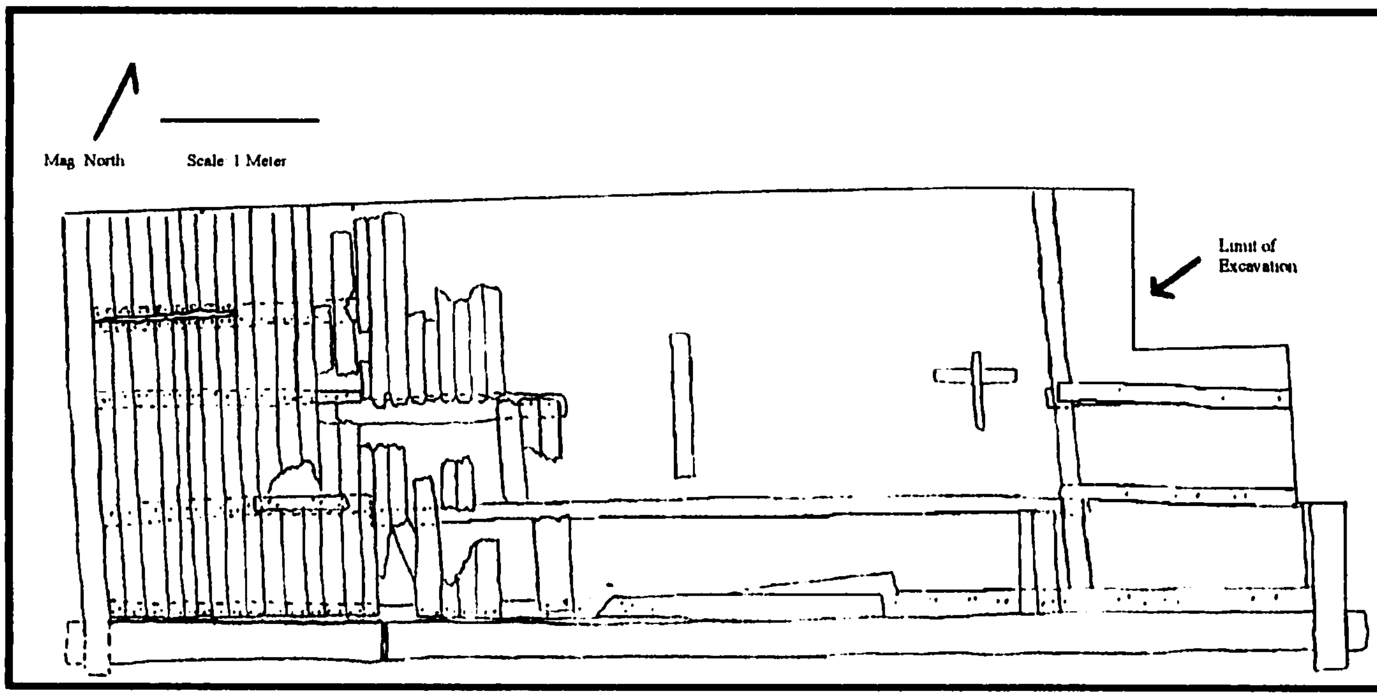

Figure B.8 Wiseman Feature 1, excavated foundation's remaining structural elements.

Wiseman 1 sill logs, and corner notching: Twenty-three square meters of the contiguous southern block was excavated (Figure B.8), plus 1 m^2 excavation unit located three meters north of this block and along the western sill log (not illustrated). The excavations uncovered the entire south sill log, as well as the southern portions of the east and west sill logs. The southern sill appears to have been laid first, with a saddle notch cut (chopped?) out of its upper/dorsal surfaces at each end, and into which the western and eastern sills were laid. In addition, the southern sill is comprised of two separate log sections, with the western smaller section slightly overlapping the other (see Figure B.8, details).

Wiseman 1 floor joists and joist pads: The *in situ* joist system exposed during excavation was unique to those excavated in Coldfoot and Tofty, in that its eastern portion was triple-tiered, or three log layers in depth. This obviously represents an attempt to keep the floor levels, counteracting a lower-elevation ground surface in this particular area. More evidence of joist tiering to keep the floor level is observed in two lengths of "floor boards" positioned one on top of the other, and nailed onto the middle portion of the southern-most joist (Figure B.8). These boards run perpendicular to the orientation of all *in situ* floor boards in the excavation (see below), and were likely placed here to keep the floor level in this part of the foundation.

A clear break in the joist system occurs ca. 2 m west from the west sill log. This break coincides with the break in the southern sill, mentioned above. Three joists approach westward from the east and terminate at this point, while four joists approach eastward and terminate at this same location. In fact, six of the joists approach and abut (see Figure B.8 details). These do not represent broken joists, as they clearly have different widths, and each is sawn through at the end. This "break" in the joist system is discussed below, when explaining the likelihood of an adjoining shed structure separate from the main habitation room.

In situ solitary joist pads in the central portion of the excavation indicate that some of the joists also were removed by wood scavengers, along with most of the floor boards in the central and eastern part of the excavated area. All remaining joists and joists pads were sawn flat on at least the upper surfaces, probably to better accommodate and secure overlying structural elements. Nails were found projecting from the tops of several of the joists, often in pairs, indicating that floor boards were at an advanced stage of deterioration when they were removed.

Wiseman 1 original ground surface and basic stratigraphy: Many of the lower-most joists and joist pads were found laying directly upon Level 3, a dark 2-4 cm organic loam that contrasted sharply with the overlying and underlying silts and fine sands (Level 2). Level 3 is interpreted as the original forest floor upon which this structure was built. It was sterile except for one piece of window glass, located within its upper-most 1-2 cm. Most artifacts in the central and eastern parts of the excavation were located directly at the transition from the Level 2 silts and the Level 3 organic loam.

Wiseman 1 insulating earthen berms: Distinct earthen berms were located all around the foundation, in a manner identical to all others discussed above. However, two gaps were evident in these berms, the southern-most two meters along the east wall, and the eastern-most three meters along the north wall. It is likely one or both of these represent access to doorways. Heights of these berms above outside-foundation ground surface are 30-42 cm (north berm), 40 cm (east berm), 40-54 cm (south berm), and 35 cm (west berm).

Wiseman 1 metal sheets used in construction: One hand-sheared side panel from a five-gallon fuel can with nail holes, seven sheared off five gallon fuel can top panels without nail holes, and two possible fragments of corrugated sheeting. The top panels by themselves do not imply use of fuel paneling in structural covering, only that such fuel cans were being manipulated and re-used. For instance, they may just as likely represent remnants of homemade buckets. On the other hand, their presence alongside a fuel can side panel with nail holes adds weight to their interpretation as byproducts of the manufacture of homemade roofing or wall shingles.

Unique to Wiseman 1's sill logs, relative to all others excavated in Coldfoot and Tofty, is the presence of strips of sheet metal "flashing" nailed to the outside edge of the exposed west sill log. These overlapping strips covered the outer southern-most 2.5 meters of this sill log. This flashing consisted of eight hand-sheared sections of rectangular sheet metal, the widths and lengths of each piece variable between 5.4-8.2 cm wide and 14.3-71.7 cm long. Other identical sheared sheet metal sections with nail holes were located among the refuse inside of the foundation.

Wiseman 1 floor boards: Numerous complete and fragmentary in situ floor boards were uncovered, predominantly in the western portions of the excavation. A complete uninterrupted set of floor boards covers the western two meters of the excavation, corresponding directly with breaks in the joist system and with the south sill log, mentioned above. *In situ* fragments of floor boards continued eastward for an additional 1.0-1.25 m. The floor boards west of the joist and sill break were very uniform, all were sawn, none exhibited tongue-and-grooves, all were either 12 or 13 cm wide, and were 1.5 cm thick.. As can be seen in Figure B.8, this section consists of 20 *in situ* boards, four of which spanned the entire exposed three meters of excavation, and 16 that abutted up to each other, eight to a side. Two additional near-complete floor boards complete those laid onto the western, small joist system. All floor boards were nailed to these underlying joists, themselves uniformly 10-11 cm in diameter and flattened on top by means of sawing. The fragmentary *in situ* floor boards that continued eastward of the break in the joist and sill system are less uniform in dimensions, ranging 10-14 cm wide, and 1-1.5 cm thick.. The three joists that underlie these fragments too are less variable, measuring 11, 16, and 17 cm in width. Following removal of the floor boards, only a single fragment of window glass was found beneath them.

Wiseman 1 adjoining shed room: Based upon the above data, I propose that a shed-like structure adjoined the western side of the structure, corresponding to the complete floor board section in the western two meters of the excavation, and to the break in the south sill log and floor joist system, mentioned above. Such side adjoining structures accompany many of the contemporary buildings in Wiseman today, and are a common feature of many such structures from turn-of-the-century Alaska as shown in historic photographs from that era. Such side features may have served as storage areas as well as work areas. That the two joist and floor boards areas on either side of the joist and sill breaks were at least constructed at different times is also supported by the change in variability in dimensions from one side of the break to the other, as outlined above. If the floor boards on either side of the break had all been laid down at the same time for the same room, one would not expect all of the joists to coincidentally stop where the south sill log "breaks," nor expect uniform floor boards to be laid down together up to that break, with variably-sized boards on the other side. Window glass clusters also support this scenario, as outlined next.

Wiseman 1 window placement: In all excavated Coldfoot and Tofty foundations, groupings of window glass overlapped and adjoined sill logs. In Wiseman 1, however, the only significant group of window glass is found "inside" the foundation, deriving from two adjoining excavation units on either side of the joist break, beginning one meter north of the southern sill. These fragments, of course, had fallen on top of the floor boards sections in these units. Assuming such fragments can be correlated with window location (as above), then a window would have been located ca. 1.5 m directly northward from the southern sill, directly above the break in the joist system. This could only be if there had once been a wall at this location, as suggested above.

Wiseman 1 "bench"-like feature: Also unique to this foundation relative to all others excavated is a wooden pole and log feature located immediately outside of the foundation, adjacent and parallel to the west end of the south foundation sill log. On the last day of excavation in Wiseman in 1995, a 2.5 m section of the thick insulating earthen berm adjoining this area of the southern sill was removed, in order to investigate a peculiar "hole" in it. This effort exposed part of a "bench," "porch," or "table"-like feature. This feature continued into unexcavated berms on either side of the exposed portion. In the section exposed by excavation, this feature was supported by two vertical stout logs ca.

16 cm diameter, sawn through on their tops, and placed about two meters apart. These "pilings" supported a 12 cm diameter horizontal log placed across and on top of them. Height of the two support logs or pilings was at least 45 cm high. The bases of the poles from the southern sill log were estimated at ca. 1.25-1.5 meters each, both equidistant from the sill. Forty-two thin poles were laid out side-by-side, perpendicular to and on top of the vertically-laid log, each 47-48 cm long and 3.5-6.5 cm in diameter, all complete and sawn through at both ends. One end of these 42 poles were all aligned with and only slightly overlapping the vertically laid log, and all of the other ends projected downward at a steep 60° angle towards the southern sill log. Whether these thin poles were intended to be in this position or not, i.e., supported by another vertically laid pole since scavenged or else unexcavated, is presently unknown. The "open" gap created by the ground surface and the vertical pole suspended by the two pilings was covered by vertical sections of flat wood, positioned side-by-side, the tops of which were nailed into the vertical log. These flat sections, 15-17 cm wide, correspond to the lengthwise sections sawn off the outer edges of larger logs. Such sections were used in some of the Coldfoot foundations (above) as floor joist pads. The sections used in this Wiseman feature were all oriented so that their rounded sides all faced "outward," or south. The downward ends of the 42 thin poles all lay directly upon a 2-3 cm thick loam horizon, likely corresponding to the old ground surface, and the Level 3 loam recorded inside the foundation. The empty space or gap created underneath the thin poles was apparently used as storage space, as a couple of lards cans, one inside the other, and an enamelware cooking pot were still upright and *in situ* hidden away beneath the poles. Again, only part of this feature was exposed on the last working day in Wiseman, with more of it continuing into the berm on either side.

APPENDIX C
DESCRIPTIONS OF OTHER NON-STRUCTURAL FEATURES EXCAVATED IN COLDFOOT AND TOFTY

Included below for comparison purposes with similar features elsewhere are brief descriptions of the non-structural features excavated during the 1994 and 1995 seasons at Coldfoot and Tofty. The "bench"-like feature excavated adjacent to the Wiseman Feature 1 foundation is described in detail in Appendix B, with that foundation's description. The reader is referred again to Figure 2.2 (Coldfoot site map; Chapter 2) and Figure 2.3 (Tofty site map, Chapter 2), maps of Coldfoot and Tofty which illustrate the relationships between the features described below and other natural and cultural features in these abandoned town sites.

COLDFOOT FEATURE 3

Coldfoot 3 is a natural oval-shaped depression, measuring ca. 5 x 3 m, and ca. 50 deep at its central lowest point. Artifacts in this feature were found on top of and throughout the upper vegetation root mat layer, which varied in thickness from ca.5 cm along the upper edges of the depression to ca. 20-25 cm thick in the central and lowest part of the depression. Below the root mat was a gravel and cobble rich loam layer of variable thickness (up to 10 cm thick) in which artifacts were found. Below this was a sterile silty fine sand. Artifacts were noted directly on top of the fine sand, but none within it. The feature was completely excavated. No grid was established; the contents were removed as one unit.

COLDFOOT FEATURE 6

Coldfoot 6 is an intentionally-dug pit filled with artifactual debris, directly associated with and ca. 1-2 m immediately west of foundation Coldfoot Feature 4. The pit was rectangular in outline with rounded corners (actual? erosion?), but upon excavation measured 230 x 120 cm, with its long axis parallel to Coldfoot 4. Prior to excavation, the inside of the pit measured ca. 20-30 cm below the surrounding ground surface, and had sloping though steep sides eroding into it. The matrix of the fill consisted of a silty fine sand, in which were found numerous artifacts. Also found within the matrix were pockets of thoroughly burned wood ash, within which were noted numerous wire nails as if from burned wood. Permafrost prevented the immediate removal of all contents, and three days were required to excavate the slowly thawing fill and artifacts. Materials were labeled as Levels 1 to 3, corresponding to the day, and depth, from which it was excavated. Base of the excavation was reached when the silt and fine sand matrix (with encompassed artifacts) reached a sterile gravel and water-worn cobble layer. This depth varied from 64 cm below ground surface at the northern end of this pit, to 75 cm deep at its southern end. The sides were vertical. The exposed (and slumping) side profiles of the excavated feature consisted of this same gavel-cobble material, indicate that the pit had been dug ca. 50-61 cm into this thick natural level. The source for the silty fine sand in which the artifacts were incorporated was likely one or more flood events from the Koyukuk River, which was situated immediately west of this feature. As mentioned in Appendix B, Coldfoot Feature 4, this cultural pit dug deep into the water worn gravel and cobble levels that underlay the upper silts and fine sands throughout the town site. These gravel and cobbles are the likely source for the culturally-laid gravel and cobble pad within the Coldfoot 4 foundation.

COLDFOOT FEATURE 10

Coldfoot 10 is a culturally-dug pit filled predominantly with tin cans, which account for 77% (n=640) of the total fill. The pit is rectangular in shape, measuring 224 x 100 cm, and when fully excavated 65 cm in depth. Many of the cans and artifacts associated with this feature were piled up around the edges of the pit. This, and the lack of a surficial vegetation layer over the fill, indicates not-too-distant past looting activity. Only ca. 10-30 cm of silt and artifacts underlay an upper layer of mostly tin cans. Like Coldfoot 6 above, the silt and artifacts bottomed out at a sterile gravel and water-worn cobble layer with coarse sand. The pit was dug about 15-20 cm into this underlying cobbly layer, indicating that the overlying silts and fine sands were appreciably thicker in this area of the site, away from the river, than next to the river (as indicated by Coldfoot 6's profile). A test pit into the bottom of this feature reveals an additional 50-60 cm of varying layers of coarse sand, gravel, and cobbles.

COLDFOOT FEATURE 11

Initially only a circular depression ca. 1.5 m diameter and 20-25 cm deep, Coldfoot 11 was sectioned in half (north to south), and excavation removed only its western half. I hoped that this feature would be an outhouse depression, and that by digging half of it we would exposed a vertical profile wall from which to take samples of fill. We were correct. Figure C.1 illustrates the post-excavation east wall profile of this feature. Immediately below the surface loamy vegetation layer (Level 1) was found a layer of bottles at the interface with Level 2 (in the north portion of the feature) and Level 3 (in the south portion. Piled bottles continued into the upper portion of the fill of Level 3, which conformed to the outline of this culturally-dug outhouse hole. The northern and western walls of this cultural hole were essentially vertical, whereas the southern side sloped downward (Figure C.1).

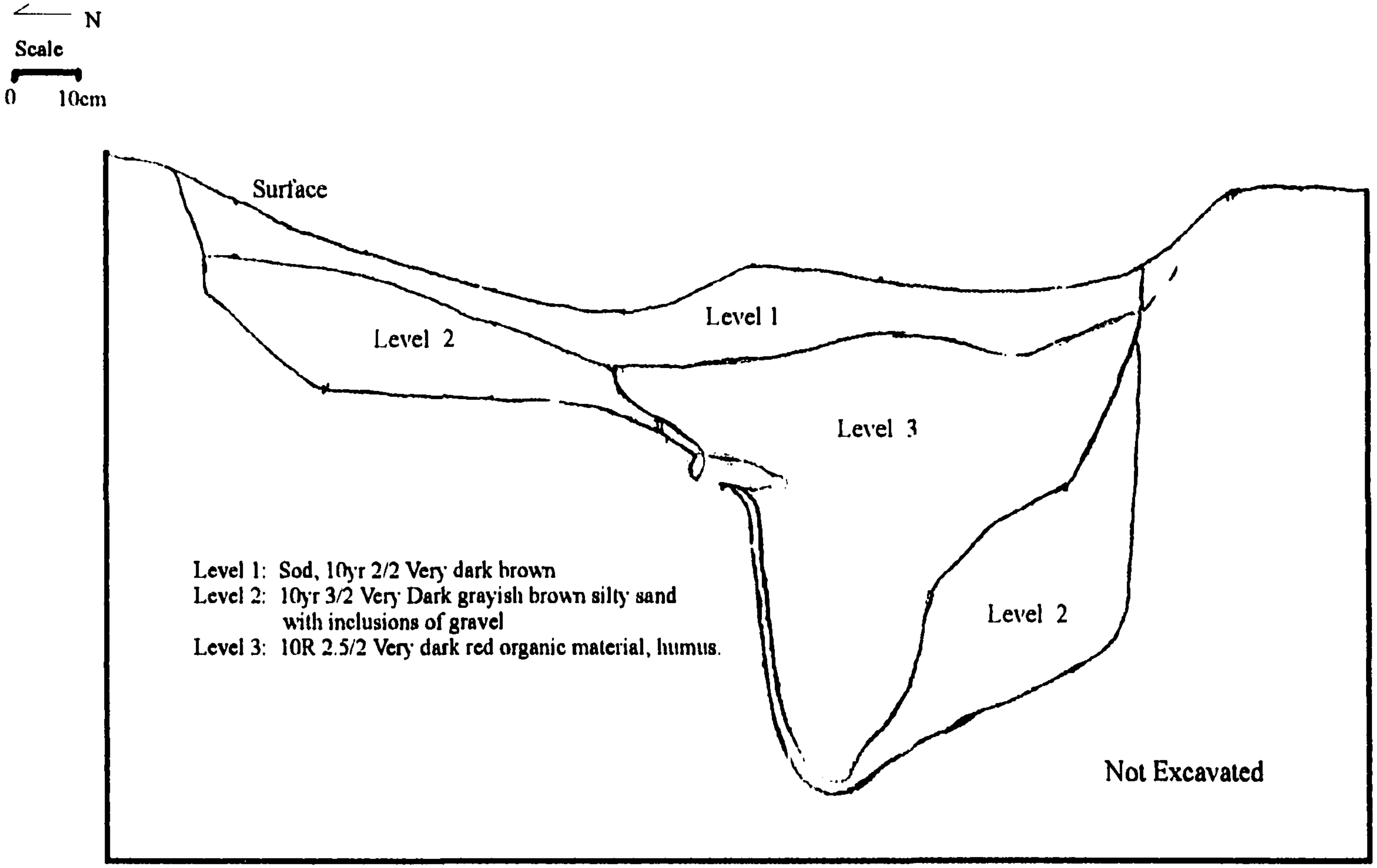

Figure C.1 Coldfoot Feature 11, east wall privy profile.

Artifacts were noted throughout the Level 3 outhouse fill, with a pile of wire nails were discovered at the base. From top to bottom, Level 3 measured 66 cm in depth. From the east wall profile, samples of fill were taken every 10 cm, for a total of seven samples. These samples were supplied to Dr. Vaughn Bryant, of the University of Texas A&M Pollen Laboratory, for analysis, who provided it to a student, Dawn Marshall, for analysis. Marshall's data and analysis are provided in Appendix A. Although little pollen was found, macrofloral remains that were identified include different varieties of berries indigenous to the Upper Koyukuk, along with those from several extrinsic species including grapes, chili peppers, and mustard (Appendix A, Table A.1). Other items found in the samples included charcoal, pieces of newsprint, glass fragments, fish vertebrae, and unidentified fragments of bones.

COLDFOOT FEATURE 16

Coldfoot 16 was a culturally-dug pit, rectangular in outline, which measured when fully excavated 168 x 94 cm, and 36 cm in depth below ground surface. As above, no grid was established over features of this nature. A small amount of refuse was excavated from within the fill, which consisted of 23 cm of fine-medium sand underneath the upper forest vegetative loam. Like Coldfoot 6 and Coldfoot 10 discussed above, it had vertical walls, but unlike those other features this pit was not dug into underlying gravels and cobbles. The sandy fill in which the artifacts were incorporated continues unaltered at least an additional 50 cm, although sterile of artifacts. This lack of an underlying gravel-cobble matrix in this particular area of the site is explained by its increased elevation south of the ravine, relative to the area immediately north of the ravine (see Figure 2.2, Coldfoot site map). Other test pits in this vicinity outside of foundation Coldfoot 5 confirm at least a meter of fine sand layers in this area.

TOFTY FEATURE 1-2

On the final afternoon at the Tofty town site, one of the exploratory test pits into Level 3 inside of the Tofty foundation (see Appendix B, Tofty Feature 1) happened upon a section of horizontal wooden poles. In the remaining hours at the site, all effort was put into exposing an intriguing cultural feature which apparently predated the construction of the overlying foundation. Owing to a lack of excavation time, more precise information than that presented below is not available.

The feature consisted of dozens of wooden tree poles piled upon each other, altogether forming a near-straight line (excepting one "bend"; see below). The bark-stripped poles were ca. 4-11 cm diameter, with some having been sawn straight through at their ends, and others chopped down with an axe or hatchet. They varied in length ca. 2.0-2.5 m, with ends that generally did not fall in line with each other. The poles formed a mass ca. 75 cm wide and at least 50 cm in depth, though the poles appeared to continue into the underlying permafrost which halted the excavation of the feature. At one place along this pile of poles did a horizontal bend and change in direction occur, a slight bend of only ca. 20°. Only at this one bend do the ends of poles line up, such that the mass of poles might continue on straight in either direction away from the bend. Directly at the bend were at least two shorter poles underneath and perpendicular to all of the others atop them. A few nails indicated that some of the longer poles may have been nailed to these two shorter poles.

Neither end of the mass of poles was unearthed, for the feature continued northeastward underneath the northern sill log, and southwestward underneath the western sill log. Test pits placed outside of the foundation in line with these extensions hit shallow permafrost within 20-30 cm. Thus it was not determined how far the pole feature extended in either direction. The exposed portion of this wooden pole feature inside the foundation confines measured ca. 6.5 m.

That the pole feature predated the foundation was apparent from the stratigraphy.

All artifacts associated with the overlying excavated foundation were found within the uppermost forest root and loam layer (Level 1). Directly underlying Level 1 throughout the interior of the foundation was a sterile silt layer (Level 2, 6-13 cm thick), which in turn was underlain by an organic-rich, dark loam layer (Level 3, 3-4 cm thick). Tests variously placed throughout the foundation through Level 2 and into Level 3 indicate a sparse amount of cultural refuse within Level 3. A large undifferentiated silty clay layer (Level 4) underlay Level 3, which continued on further into permafrost. The top of the pole feature was co-eval with Level 3 for its length, continuing into Level 4. The only artifacts actually found within Level 4 were those found directly among and touching the pole feature. Stratigraphically, then, the pole feature is contemporaneous with Level 3, and separated by a sterile (flood?) silt layer (Level 2) from both the foundation sill logs (laying on and in Level 2 sterile silt) and all foundation-related artifacts in Level 1. Owing to the contemporary nature of Level 3 and the pole feature, the few artifacts found among the wooden poles are placed within the Tofty "Level 3" column in Appendix E.

The function of the pole feature is presently unknown. Suggestions include:
(1) A boardwalk for walking on. The site area is certainly prone to flooding episodes, as indicated by the stratigraphy, and the old town site might have required such features to move between structures during spring break up and other flooding episodes. However, why strip the poles of bark?
(2) Some type of a upright wall or fence structure that has since collapsed in place or fallen over. However, the lack of shorter vertical poles that would have held up or otherwise secured the longer horizontal poles lends suspicion to this idea. Also, the fact that the poles's ends do not line up sequentially along the length of the feature (except at the bend) would have made awkward securing the posts vertically.

APPENDIX D
"SPRAGUE" CLASSIFICATION SCHEME USED IN THIS STUDY (ADAPTED FROM SPRAGUE 1981)

All artifacts excavated from Coldfoot, Tofty. and Wiseman in 1994 and 1995 were catalogued using an adapted version of the "Sprague typology" (Sprague 1981). The basic outline and major artifact classes of this classification scheme were developed for use in the downtown Fairbanks "Barnette Street" archaeological project (c.f., Bowers and Gannon 1997). As more than 100,000 artifacts from the Barnette project had been catalogued using Sprague as a guide, it was felt advisable to continue this use with other interior Alaskan gold mining settlements dating to the turn of the twentieth century. Of course, modifications were made when necessary to the pre-existing Barnette classification. Table D.1, below, provides additional explanatory information not provided in the artifact inventory presented in Appendix E.

Table D.1 Classification scheme used in this study (adapted from Sprague 1981).

1. PERSONAL ITEMS
    - A. clothing
        - 1. hardware
            - a. buttons
            - b. snaps
            - c. (space empty)
            - d. garter
            - e. suspender
            - f. buckles
            - g. (space empty)
            - h. zipper
            - i. rivet
            - j. hinged clasp
            - k. cuff link
        - 2. textile/cloth/leather
            - a. shirt
            - b. suspender strap
        - 3. belt
        - 4. glove
        - 5. mitten

1 A 6. labels

B. footwear

1. shoes
2. boots
3. metal footwear hardware (incl. boots & shoes hooks, eyes, grommets)
    a. shoe nails
    b. heel stiffeners
    c. heel plates

C. adornment

1. rings
2. pins
3. chains
4. beads
5. pendants

D. body ritual and grooming

1. dental care
    a. toothbrush
    b. toothpaste and powder
    c. mouthwash
2. hair care
    a. combs
    b. brushes
    c. scissors
    d. razors
    e. shaving mugs
    f. curling irons
    g. shampoo
    h. shaving accessories
    i. bobby pins
    j. hair pin
3. perfumes, toilet waters
    a. talc
    b. perfume
4. mirror (personal &/or handheld)
5. makeup

E. medical and health

1. patent & pharmacy medicines
    a. tins
    b. bottles & jars
        1. stoppers
    c. tubes
2. syringe

I E 3. thermometer
4. eyeglasses
5. hotwater bottle & accessories
6. protective eyewear
F. birth control
G. indulgences
1.candy/gum
2. smoking
a. tobacco tins
b. pipes
c. cigarettes
3. snuff & chewing tobacco
a. tins
b. plug stamps
4. alcohol (includes cans & bottles; includes approp. corks, caps, etc.)
a. beer
b. wine
c. distilled
d. assorted corks, caps, & other closeable & non-recloseable stoppers known to function
H. pastimes & recreation
1. writing utensils
a. pencil
1. eraser
2. shaft
3. ferrule
4. pencil lead
b. pen
c. ink well
d. ink bottle
e. paint brush
f. chalk
2. musical instrument
a. harmonica
3. toys
a. marble
b. doll
c. crayon
d. child's ceramic tea set
4. audio playback
a. record
b. record player

1 H 4 c. music box
5. games
a. poker chips
5 b. dice
c. playing card
I. ritual personal
1. religious medallions
2. crucifix
3. rosary beads
J. pocket tools & accessories
1. purse/wallet
2. whetstone
3. pocketknife
4. watch
a. chain
b. band
1. buckle
K. infant care
L. luggage
M. storage (e.g., trunks)
N. money
N 1. coins
2. currency tokens

2. DOMESTIC ITEMS
A. furnishings
1. carpet
2. linoleum
3. wallpaper & architecturally-used contact paper (ID ea. as such)
4. tile
5. furniture & parts
a. spring
6. time keeping devices (non-wrist or pocket)
a. gears
b. face
c. hardware
7. curtain related
8. table cloth
9. venetian blind holders
10. shelf
11. (space empty)
12. wall/bureau mirror

2 A 13. furnishing tacks (furniture; upholstery; carpet)

B. housewares & appliances

1. culinary (food preparation)
    a. food waste
        1. food bones
        2. food shells (e.g., peanut; walnut; egg; mollusks)
        3. pits/seeds
    b. storage
        1. burlap sacks
    c. kitchen appliances
        1. grinder
            a. spice grinder
        2. shaker (e.g., salt and pepper)
    d. food, condiment & beverage containers (NON-ALCOHOLIC)
        1. beverage (again, non-alcoholic; includes both cans and bottles)
            a. soda-pop
            b. water
        2. condiments (includes both cans and bottles)
            a. mustard
            b. ketchup
            c. worcestershire
            d. spices
        3. food
            a. canning/Mason jars
            b. coffee
            c. tea
            d. baking powder
            e. cooking oil
            f. unid. fruit/vegetable
            g. crystallized egg
            h. butter
            i. starch
            j. condensed milk
            k. lard
            l. meat/fish/bacon
            m. maple syrup
            n. evaporated milk
            o. corn syrup
    e. cooking pots & pans
        1. skillet
        2. bread pan

2 B 1 e 3. coffee pot
4. cook pot
5. pot lid
6. rectangular pan
7. circular pan
8. tea pot/kettle

f. cooking utensils
1. knives
2. spatula
3. measuring cup
4. ladle
5. skimmer
6. strainer
7. big stirring/cooking spoon

g. bottle & can openers
1. turn key
a. turn key strip
2. church key
3. corkscrew/folding corkscrew
4. butterfly clasp
5. crown cap opener

h. closers (bottles & jars; place here if by context the function -- e.g., beer, wine patent/prescription-- is unknown)
1. stoppers
2. caps (e.g., Hutchinson's; crown)
3. seals

2. gustatory (food eating)
a. food
1. plates
2. bowls
3. saucers
4. (space empty)
5. table utensils (including unid. handles)
a. knife
b. fork
c. spoon

b. beverage
1. drinking glasses (includes stemmed, & shot glasses)
2. swizzle sticks
3. pitcher
4. cups (ceramic; enamelware)

3. portable illumination

2 B 3 a. batteries
b. flashlight & accessories
c. lantern (kerosine or gas; distinguish if can)
1. associated parts
2. chimney glass
d. candle
e. lamp
f. matchstick
4. portable waste disposal & sanitation
a. wash basin
5. portable heating/cooking
a. portable stove/heater
b. fuel cans (e.g., 5 gal. square; 1-2 gal. rect.)
6. domestic ritual
7. household pastimes (e.g., flower pot)
8. home education, information, business
a. reading material
b. magazine
c. book
d. newspaper
9. non-kitchen appliances
a. electrical plug
b. receptacle
C. cleaning and maintenance (2C includes "buckets")
1. cleaning
a. scrub brush
2. household maintenance (e.g., glue, oil can)
a. thumb tack
3. laundry
a. hangers
b. cloths pins
c. iron
4. sewing
a. thimbles
b. needles
c. pins
1. straight
2. safety
d. bodkin/awl
5. pest control
a. fly swatter
b. mouse trap

2 C 5 b 1. spring
- 6. scraps for general household maintenance (e.g., cloths patches)

3. ARCHITECTURE
- A. structures
- B. construction
  - 1. materials (includes structural dimensional lumber)
    - a. window
      - 1. glass panes
      - 2. glazier points
      - 3. caulking
      - 4. wire window mesh/screen
    - b. interior
      - 1. plaster
      - 2. oil cloth
    - c. exterior roofing & walls
      - 1. sheet metal
        - a. flat metal (not fuel cans; see 3B1c2b below)
        - b. corrugated
      - 2. shingles
        - a. wood
        - b. metal (includes "unwrapped" cans & stove pipes)
      - 3. tar paper & building paper
        - a. fastener (e.g., tarpaper tack)
    - d. miscellaneous
      - 1. paint
    - e. foundation
      - 1. metal flashing
  - 2. hardware
    - a. fasteners
      - 1. nails
        - a. regular wire
        - b. finishing
        - c. roofing
        - d. machine cut
        - e. hand-wrought
      - 2. screws
        - a. metal
        - b. wood
      - 3. cotter pin
      - 4. hooks and eyes
      - 5. brass fitting

3 B 2 a 6. staples
7. rivet
8. nuts & bolts
9. rod
10. (space empty)
11. washer
12. grommet
13. metal strapping
14. locking pin
15. small truss plate

b. hinges
1. hinge pin
2. hinge ball

c. nailers for wooden boxes (metal strapping/3B2a13 with nails driven through)

d. braces/brackets/flanges

e. metal stock (i.e., rods and bars)

f. door fixtures
1. locks
a. lock key
2. knob handles
3. strike plates

g. cabinet fixtures (in a general sense)
1. latch hardware (includes cabinet keys if this function is known)
2. knobs

C. plumbing
1. pipes
2. drain
3. spigot
4. valves
5. fittings/couplings
a. spring coupling

D. fixed illumination & power
1. wire
a. braided
b. solid
2. fuses
3. sockets
a. Edison key socket
b. keyless socket
4. light bulbs

3 D 5. insulators
- a. large, for main pole
- b. small, for inside house
  - 1. porcelain tubes
  - 2. porcelain insulators
  - 3. porcelain cleats
    - a. one wire
    - b. two wire
    - c. three wire

E. telephone
- 1. telephone batteries

F. fixed heating, cooling, atmospheric conditioning
- 1. stoves/furnaces
- 2. steam pipe
- 3. stove pipe & accessories
- 4. stove floor bracings

G. wiring fixtures

H. private communication
- 1. door bell

4. PERSONAL AND DOMESTIC TRANSPORTATION

A. vehicles
- 1. horse/dog accouterments
  - a. horseshoe
  - b. horseshoe nails
  - c. horse/dog harness parts
    - 1. harness keep ring
    - 2. swivel snap
    - 3. buckles
    - 4. other hardware
- 2. vehicle accessories
  - a. chains (if not attached to a known accessory, move to 8C3)
  - b. fixtures/accessories
  - c. wagon pin
  - d. wheel
  - e. sled parts

B. maintenance
- 1. bailing wire
- 2. pine tar (in small cans; i.e., for horse galls)

C. ritual

5. COMMERCE AND INDUSTRY

5 A. agriculture
B. hunting
    1. guns
        a. associated hardware
    2. ammunition
        a. cap
        b. cartridge
        c. live round
        d. lead shot
        e. primer cap
        f. shotgun shell
        g. shotgun wadding
        h. bullet
C. fishing
    1. hooks
    2. sinkers
    3. lures
    4. rods
    5. ice pick
D. gathering
    1. berry brush
E. trapping
F. logging
G. mining
    1. steam point
    2. high pressure hose
H. construction
    1. tools
        a. hammer
        b. drills
        c. wrenches
        d. pliers
        e. shovels
        f. plumb bob
        g. files
        h. drill bits
        i. screwdrivers
        j. saw blades
        k. trowels
        l. paint brush
        m. knife
        n. chisel

5 H 1 o. whetstone (larger ones; smaller handheld in Personal)
p. soldering iron
q. ax head
r. plane
s. pick ax
t. wire/cable cutter

I. manufacturing
1. handicraft
2. industrial

J. commercial services
1. advertising signs
2. storage
a. barrel hoops
b. staves
3. entertainment
4. beverages
5. record keeping
a. receipts
b. ledgers
c. binders, clipboards
d. paper clips

6. GROUP SERVICES
A. banking/monetary system
1. bank drafts
2. miners poke
3. scale accessories
B. public administration
1. taxation
2. stamp
3. international customs

7. GROUP RITUAL

8. UNKNOWN/UNCLASSIFIED
A. glass fragments, unidentifiable to function
1. bottles
2. other (non-bottle, non-window glass)
3. melted and unidentifiable to function (IF function known, place there instead)
4. unknown thin clear glass (either 3B2c2 or 2B2b1, but do not know which)

8 B. sheet metal fragments
C. miscellaneous metal
1. wire, functionally unknown (see 2C3a, 4B1)
a. cable
2. cans, <u>unidentifiable to function</u> (e.g., cans one cannot even label 2B1d3 or 2B5b)
a. cans
b. can lids/ends
c. bails
3. hardware (functionally unknown; multiple functions common; context does not help)
a. chain
b. iron ring
c. threaded keep ring
d. D-ring
e. gear
f. clasp
g. cable clamp
h. spring
i. padlock
j. functionally unknown pipes (and couplings, fittings, caps, etc.)
4. metal lids (unknown function; NOT can lids)
D. engine parts (if in a setting where the function would be unknown)
1. spark plugs
2. gasket
3. muffler
E. plastic, functionally unknown
F. paper, functionally unknown
G. wood & charcoal fragments
H. coal
I. faunal remains, not known to be food remains
J. OTHER, completely unidentified material
K. ceramic, functionally unknown
L. textiles, functionally unknown (if oil or building cloth, move to Construction Material)
1. woven
2. felt
3. rubberized
M. unidentified synthetic viscous liquid
1. oil
N. leather, functionally unknown
O. cordage

8 O 1. twine

P. foil, functionally unknown

Q. cork, functionally unknown

R. rubber, functionally unknown

S. lithic, functionally unknown

T. ivory, functionally unknown

APPENDIX E

COLDFOOT, TOFTY, AND WISEMAN ARTIFACT INVENTORY

CATALOGUED ARTIFACTS NOT IN APPENDIX E

More than 19,000 artifacts were collected and inventoried during the 1994 and 1995 field seasons at Coldfoot, Tofty, and Wiseman. Most of these were excavated from the thirteen cultural features described in Appendices B and C, which included foundations, trash pits, privy hole, the "bench" feature adjacent to Wiseman Feature 1, and the "pole" feature stratigraphically below Tofty Feature 1. All of these artifacts are presented numerically by classification code, and by feature and sub-feature localities in Table E.1. The difference between the total in this table (18,749) and the 19,000 artifacts referred to above stems from the non-systematic collection or field recording of artifacts from other features not presented in Appendices B and C. These other features include:

(1) a refuse scatter ca. 25-30 m from the Wiseman 1 foundation. Materials, primarily bottles and tin cans, were gathered from this feature for inclusion into a growing bottle and can typology. This refuse feature contained material spanning from the date of the Wiseman 1 foundation through to the present, as the feature has continued to attract attention as a refuse disposal site to the present day;

(2) a contemporary looter's pile of bottle glass associated next to Coldfoot Feature 25 (a trash-filled ravine) was systematically catalogued, with a number of bases and lips maintained for type collection, and the rest disposed of after sorting, weighing, and cataloguing in the field; and

(3) artifacts associated with a refuse pit (Coldfoot Feature 17) eroding out of the Koyukuk River cut bank. Items collected from this feature include unique items, complete items, and bottle bases.

UNDERSTANDING ARTIFACT "TOTALS" IN TABLE E.1

An important point regarding Table E.1 is that, excepting a few completely unidentifiable materials artifacts presented in artifact class 8J (Unknown Artifacts, Unidentifiable Material), there are no "miscellaneous" or "other" categories in the adapted Sprague classification system presented in Appendix D. Artifacts that do not fit perfectly into a artifact class listed in the classification system in Appendix D are placed into the appropriate preceding higher-order artifact class in the classification hierarchy. For instance, any "Tools" (code 5H1: Commerce and Industry, Construction, Tools) that are not found listed in this class (5H1a: hammer, to 5H1t: wire cutter), were given the 5H1 "higher order" code, not a "miscellaneous" or "other tools" category. Likewise, some unique hardware fasteners (code 3B2a: Architecture, Construction, Hardware, Fasteners) that did not fit into the list provided below this class (e.g., 3B2a1: nails, to 3B2a15: truss plate), were simply listed as 3B2a; i.e., there is no "other fasteners" category.

Numbers provided in some of "higher-order" classes (e.g., as above, 5H1 and 3B2a) also represent complete items of that class, and the classification breakdown listed below it corresponds to pieces or components of that class. For instance, numbers of complete "Pencils" (code 1H1a: Personal, Pastimes & Recreation, Writing Utensils, Pencils) were provided with the 1H1a code, but fragments of pencils were given appropriate class codes listed below this class (e.g., 1H1a1: eraser; 1H1a2: shaft; 1H1a3: ferrule; 1H1a4: lead).

"Higher-order" classes that do not have any artifact numbers listed in the columns next to them thus do not serve either of these two needs described above ("miscellaneous/ other", and "Complete Items"), and the classification breakdowns listed beneath them are assumed to contain all artifacts within that class.

Table E.1 does not contain any totals or sub-totals tabulations within the eight major groups of artifact classes (i.e., "Personal," "Domestic," "Architecture," "Transportation," "Commerce & Industry," "Group Services," "Group Ritual," and "Unknown/Unclassified"). Only after each of these eight major classes of artifacts is there a "sub-total" for that major group. There is provided a grand total of artifacts at the very bottom of the table per feature column, as well as row totals per artifact class across the features.

For the most part, the numbers presented in Table E.1 correspond to fragments or to complete artifacts. In a few cases, however, where broken and conjoinable items were found directly associated with each other, clearly representing a single broken artifact, a single artifact count is provided. The presentation of raw numerical frequencies was maintained even for glass bottle artifact classes (excepting Coldfoot Feature 3, where some of the body sherd information was lost prior to recording; see below). It is recognized, however, that bottles and jars are by their nature very breakable items, and may thus easily "inflate" artifact counts well beyond their apparent frequency. As there were very few jars and jar fragments, they were separated from the bottle glass first. This was easily accomplished as the shape and attributes of this artifact class were typically distinct from that of bottles.

Next, all bottles and associated fragments per feature were separated by distinct color (36 recognized colors in this study, and in Bowers and Gannon 1997). These were then sorted into complete and fragmentary body, base, and lip pieces. From these, Minimum Number of "Individuals" were computed based upon these three areas of the bottle, which are presented in Table E.2. All applicable bottle attributes were used in determining these MNIs, including varying surface texture, basal attributes (e.g., cup and/or post molds; presence or degree of kickup; diameter; etc.), lip attributes (e.g., type of lip; position of side seams relative to top of lip; etc.), and body attributes (e.g., degree of curvature to indicate diameter/size of bottle). Most of the glass bottle recovered from the excavations conforms to a type of bottle prevalent in many other turn-of-the-century Alaskan mining sites, which most likely contained beer, which contain the following characteristics: ca. 29 cm tall, ca. 7.8-8.0 cm basal diameter, and typically tinted light blue, aquamarine, light green, or dark brown/ amber. Bottle glass conforming to this bottle type was easy to recognize, as fragments not conforming to these attributes were few and easy to distinguish. Complete bottles of this type at Coldfoot, Tofty and other Alaskan mining sites investigated by myself indicate a variable weight for otherwise nearly identical bottles. The weight difference between otherwise identical looking bottles may be dozens of grams. Using a rough average of complete examples of this typical beer bottle type as a guide, weight of like-glass (i.e., color, curvature) was also used as a proxy to determine bottle MNI, along with estimates based upon lips and bases. In cases where there was a large enough sample of bottle glass, these weight MNIs conformed well with basal and lip MNIs. Table E.2 lists the results of these efforts, providing MNIs per feature, per color, per function, per part of bottle body.

RE-USE AND CHANGING ARTIFACT FUNCTION

Table E.1 provides a listing of all artifacts by the classification code system presented in Table D.1 in Appendix D, which in most cases corresponds to a functional category, as opposed to a descriptive classification system. In cases where an artifact was re-used or otherwise manipulated to perform a function different from the one originally intended, the last recognizable function of an artifact is the code for that item provided in Table E.1.

SEPARATE COMPONENTS AND SUB-FEATURES PRESENTED IN TABLE E.1

I decided to present as much specific information as possible in Table E.1. Thus, data from many of the excavated features are divided into separate components, sub-features, or temporally-significant stratigraphic units, as was determined in the field. For example, Coldfoot Feature 1, a structural foundation, is divided into six analytical units in Table E.1, whereas its associated refuse pit Coldfoot Feature 3 has only one. The analytical divisions of the excavated features, as presented in Table E.1, are outlined briefly below. More detail of these analytical units are provided in Appendices B and C.

Coldfoot Feature 1, foundation: (1) artifacts from the cellar box ("CF1 box"), (2) the arctic entryway ("CF1 entry"), (3) a dense concentration of bones labeled "Feature 1-3" located within one area of the berm ("CF1 F.1-3"), and (4) (5) two test pits outside of the foundation ("CF1 TP2," "CF1 TP3") were presented separately from (6) the rest of the Coldfoot 1 foundation ("CF1 other"). No meaningful "earlier" or "later" stratigraphic components were noted for this feature. Note: only the few artifacts found within the "Feature 1-3" bone bed are listed in this appendix. Bone counts per element per species from thus sub-feature have not presently been tabulated.

Coldfoot Feature 3, refuse scatter in a natural depression: this feature was completely excavated, and all artifacts listed together ("CF3 all"). The broken bottle glass in artifact classes 1E1b (medicine bottles and jars), 1G4a-c (alcohol containers, all bottles in this feature), 2B1d2 (condiment containers), and 8A1 (functionally unknown bottles) are presented in terms of Minimum Number of Individuals (MNIs) in this feature, based upon minimum numbers of bases and lips, by color. Unfortunately, bottles body sherds from these categories were disposed of from this feature prior to their counting and weighing, whereas bases and lips were separated and kept. NOTE: *All other features in Table E.1 for these four artifact classes are presented in terms of actual numbers of artifacts, not minimum number of bottles.* Table E.2 is presented separately, and provides all bottle and jar data in terms of minimum numbers of bottles or jars.

Coldfoot Feature 4, foundation: artifacts from (1) the small cellar box ("CF4 box") and (2) the looter's spoil pile ("CF4 spoil") are separated out from (3) the rest of the foundation ("CF4 other").

Coldfoot Feature 5, foundation: artifacts are divided into (1) those below the intact wooden floor, designated as Level 4 in the field ("CF5 L4"), and (2) all those found in the fill layers on top of and above the floor, which includes those few artifacts found while excavating the berm at the southwest corner of this feature ("CF5 fill").

Coldfoot Feature 6, refuse in an intentionally dug pit: this feature was completely excavated, and all artifacts listed together ("CF6 all").

Coldfoot Feature 7, foundation: (1) the entire assemblage of this foundation is listed together ("CF7 found"), with (2) only a test pit placed outside of the foundation listed separately ("CF7 TP1").

Coldfoot Feature 10, refuse in an intentionally dug pit: this feature was completely excavated, and all artifacts listed together ("CF10 all").

Coldfoot Feature 11, refuse associated with the privy pit: this feature was half excavated, and (1) all artifacts found within the privy fill, from top to bottom, are listed together ("CF11 fill"). However, (2) the few artifacts that were found in the upper moss level within the larger surficial depression surrounding the actual privy hole, as well as those collection from a 1.5 m radius around this depression, were listed separately ("CF11 surface").

Coldfoot Feature 14, foundation: (1) artifacts found directly on top of the cellar floor, underneath the collapsed floor board and joist section, were listed separately ("CF14 cellar"), as well as (2) a few items from a test pit placed outside of the foundation ("CF14 TP1"). (3) All of the remaining artifacts from this excavated from this foundation were are together ("CF14 other").

Coldfoot Feature 16, refuse in an intentionally dug pit: this feature was completely excavated, and all artifacts listed together ("CF16 all").

Tofty Feature 1, foundation: (1) artifacts from within the subterranean storage box ("T1 box") and (2) (3) (4) (5) four test pits placed outside of the foundation ("T1 TP1" to "TP4") are listed separately, along with (6) artifacts from the stratigraphically distinct Level 3 unearthed while excavating around the "pole feature" plus those from scattered tests in the foundation dug through the mostly sterile Level 2 ("T1 L3"). (7) All other artifacts excavated from this foundation, as well as those few collected from directly on top of the berm outlining the foundation are listed together ("T1 L 1-2").

Wiseman Feature 1, foundation: (1) besides all artifacts excavated from within this foundation ("W1 found"), artifacts were listed separately from (2) on top of the earthen berm surrounding the feature ("Surface around W1"), (3) the "bench"-like feature immediately adjacent and south of the feature ("W1 bench"), as well as (4) from a systematic and extensive metal detector survey done around the foundation ("Metal det. around W1").

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
1 PERSONAL ITEMS																	
A. clothing																	
1 hardware	1											1		2			
a. buttons	35	1					7	7			1	19	17	17			
b. snaps	1											2	2	1			
c. (space empty)																	
d. garter																	
e. suspender	4	1					4						1				
f. buckles	1	2															
g. (space empty)																	
h. zipper																	
i. rivet	9						1					2	1				
j. hinged clasp																	
k. cuff link	1											4		1			
2 textile/cloth/leather	4							1									
a. shirt																	
b. suspender strap	4											1					
3 belt	1																
4 glove							2										
5 mitten	1																
6 labels																	
B. footwear																	
1 shoes	1																
2 boots	3						11						6	1			
3 footwear hardware	30						1	2			2	15	1	4			
a. shoe nails																	
b. heel stiffeners																	
c. heel plates	1																
C. adornment																	
1 rings	1																

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
2 pins														3			
3 chains																	
4 beads	185	1										57		40			
5 pendants	1																
D. body ritual & grooming																	
1 dental care																	
a. toothbrush	1																
b. toothpaste & powder	2																
c. mouthwash																	
2 hair care																	
a. combs	8						2						1	3			
b. brushes																	
c. scissors																	
d. razors																	
e. shaving mugs																	
f. curling irons																	
g. shampoo																	
h. shaving accessories	1																
i. bobby pins			1					1						1			
j. hair pin														3			
3 perfumes, toilet waters																	
a. talc																	
b. perfume																	
4 mirror (personal, handheld)	1																
5 makeup																	
E. medical and health																	
1 patent/pharmacy medicine	1																
a. tins												1					
b. bottles & jars	1	3					1				1		1	1			
1 stoppers							1										

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
c. tubes			1				4										
2 syringe																	
3 thermometer																	
4 eyeglasses																	
5 hotwater bottle																	
6 protective eyewear	1											2					
F. birth control																	
G. indulgences																	
1 candy/gum																	
2 smoking																	
a. tobacco tins	15						41	3				1	3				
b. pipes	2											1					
c. cigarettes																	
3 snuff & chewing tobacco																	
a. tins	4						18	2					7	1			
b. plug stamps	5	1					5					9		2			
4 alcohol							1										
a. beer	312	19	6				13						69	7			47
b. wine	10	1															
c. distilled							1									1	
d. alcohol stopper/closure	8	1				1		2									
H. pastimes & recreation		1												1			
1 writing utensils																	
a. pencil	1											3		3			
1 eraser																	
2 shaft																	
3 ferrule												1					
4 pencil lead												6					
b. pen																	
c. ink well											1						

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
d. ink bottle																	
e. paint brush							1										
f. chalk	1													9			
2 musical instrument																	
a. harmonica													1				
3 toys																	
a. marble	3												1	3			
b. doll													1				
c. crayon																	
d. child's ceramic tea set																	
4 audio playback																	
a. record	3														2		
b. record player																	
c. music box																	
5 games																	
a. poker chips	16							3						1	47		
b. dice																	
c. playing card																	
I. ritual personal																	
1 religious medallions																	
2 crucifix																	
3 rosary beads																	
J. pocket tools & accessories	1						1										
1 purse/wallet																	
2 whetstone																	
3 pocketknife	1												1				
4 watch	1														1		
a. chain													1				
b. band																	
1 buckle																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
K. infant care																	
L. luggage																	
M. storage (e.g., trunks)																	
N. money																	
1 coins	4											3		1			
2 currency tokens	2																
"Personal" sub-total:	689	31	8	0	0	1	115	21	0	0	5	128	114	105	50	1	47
2 DOMESTIC ITEMS																	
A. furnishings	1																
1 carpet																	
2 linoleum																	
3 wallpaper, contact paper																	
4 tile																	
5 furniture & parts	1											1	40				
a. spring																	
6 time keeping devices																	
a. gears	1							1		1			1				
b. face								1					1				
c. hardware							1	3					3	1			
7 curtain related	1																
8 table cloth																	
9 venetian blind holders																	
10 shelf																	
11 (space empty)																	
12 wall/bureau mirror																	
13 furnishing tacks	2											5	1				
B. housewares & appliances																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
1 culinary (food prep.)																	
a. food waste																	
1 food bones	282	2	2				166	20			64	49	10	8			
2 food shells	8							2				4	2	1			
3 pits/seeds	29	1					4	5				66		5			
b. storage																	
1 burlap sacks																	
c. kitchen appliances																	
1 grinder																	
a. spice grinder																	
2 shaker																	
d. food, condiment & beverage containers																	
1 beverage			1										1				
a. soda-pop																	
b. water																	
2 condiments													4				1
a. mustard																	
b. ketchup	8						1										
c. worchester	2		1				1										
d. spices																	
3 food (cans, except a)	19						103	8			2		72	3		1	
a. canning jars							35										
b. coffee	20		2				5				1		1			3	
b/l coffee or butter							1	4			1	1					
c. tea																	
d. baking powder	3						8				1		2				
e. cooking oil	1												1				
f. fruit/vegetable																1	
g. crystallized egg							1						3				

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
h. butter	10		5				1	1			4	1	10				
i. starch													3				
j. condensed milk	3						34	1		1			17			1	1
j/n cond./evap'd milk	6											1					1
k. lard							1				2		5	1			
l. meat/fish/bacon							34				1		20				1
m. maple syrup											1						
n. evaporated milk							30	1					28			3	
o. corn syrup								1									
e. cooking pots & pans																	
1 skillet																	
2 bread pan	1																
3 coffee pot																	
4 cook pot																	
5 pot lid								2									
6 rectangular pan														1			
7 circular pan	1																
8 tea pot/kettle																	
f. cooking utensils	1																
1 knives								1				1		1			
2 spatula																	
3 measuring cup																	
4 ladle																	
5 skimmer																	
6 strainer																	
7 big cooking spoon																	
g. bottle & can openers															1		
1 turn key	25						10					22	3	1			
a. turn key strip	5						7					1		5			
2 church key																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
3 corkscrew																	
4 butterfly clasp																	
5 crown cap opener																	
h. closers																	
1 stoppers																	
2 caps	4	1										1	1	1			
3 seals	3																
2 gustatory (food eating)																	
a. food	5	19					5										2
1 plates							1						1				
2 bowls																	
3 saucers																	
4 (space empty)																	
5 table utensils														1			
a. knife	1											1					
b. fork	1																
c. spoon	1						1				2	2					
b. beverage	1																
1 drinking glasses	1												1				10
2 swizzle sticks	2																
3 pitcher																	
4 cups	1						15										
3 portable illumination																	
a. batteries	2						1				1			1			
b. flashlight & accessories																	
c. lantern																	
1 associated parts	1						2										
2 chimney glass	4						19										
d. candle	1												3				
e. lamp	1																

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
f. matchstick																	
4 portable waste disposal & sanitation																	
a. wash basin							2										
5 portable heating/cooking												1					
a. portable stove/heater												1					
b. fuel cans	1		3				2	1			1		22				
6 domestic ritual																	
7 household pastimes																	
8 home education, information, business																	
a. reading material																	
b. magazine																	
c. book																	
d. newspaper													20				
9 non-kitchen appliances																	
a. electrical plug																	
b. receptacle																	
C. cleaning and maintenance																	
1 cleaning																	
a. scrub brush																	
2 household maintenance	1											1					
a. thumb tack																	
3 laundry																	
a. hangers	1																
b. cloths pins							3										
c. iron																	
4 sewing								1									3
a. thimbles																	
b. needles																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
c. pins																	
1 straight													1	1			
2 safety	4	1									4			2			1
d. bodkin/awl	1																
5 pest control																	
a. fly swatter																	
b. mouse trap																	
1 spring											1						
6 scraps																	
"Domestic" sub-total:	467	24	14	0	0	0	494	53	0	2	86	159	277	33	1	9	20
3 ARCHITECTURE																	
A. structures																	
B. construction																	
1 materials	1								1								
a. window																	
1 glass panes	177	71	1				355	12			42	33	30	95			19
2 glazier points																	
3 caulking	2	7										2		2			
4 wire window screen																	
b. interior																	
1 plaster																	
2 oil cloth	4							4			31						
c. exterior roofing & walls																	
1 sheet metal																	
a. flat metal	2													1			
b. corrugated																	
2 shingles																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
a. wood																	
b. metal	4												14				
3 tar & building paper	589																
a. fastener																	
d. miscellaneous																	
1 paint			1														
e. foundation																	
1 metal flashing																	
2 hardware																	
a. fasteners	2						4							1			
1 nails	239																
a. regular wire	380	30	14				113	94			146	526	185	347			42
b. finishing	1	1						1					1				
c. roofing							2							1			
d. machine cut	16	1	1								1	10	1	1			1
e. hand-wrought																	
2 screws	3													1			
a. metal	1						1										
b. wood	12						1					2		2			
3 cotter pin																	
4 hooks and eyes	6						1					2					
5 brass fitting																	
6 staples							1					2	2				
7 rivet														2			
8 nuts & bolts	18	1					3				1	2	1	5			
9 rod																	
10 (space empty)																	
11 washer	13							2						3			
12 grommet	1							7	1		1		1	1			
13 metal strapping												2					

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
14 locking pin	4																
15 small truss plate																	
b. hinges	2										1		2	3			
1 hinge pin	2		1														
2 hinge ball																	
c. nailers	34		2				19	3			1	18	37	14			
d. braces/brackets/flanges	3						1	2					1				
e. metal stock	8	2	1				4							1			
f. door fixtures	1							1									
1 locks																	
a. lock key								1				1					
2 knob handles											1						
3 strike plates																	
g. cabinet fixtures																	
1 latch hardware	1											1					
2 knobs												1					
C. plumbing																	
1 pipes																	
2 drain																	
3 spigot																	
4 valves																	
5 fittings/couplings																	
a. spring coupling																	
D. fixed illumination & power																	
1 wire																	
a. braided																	
b. solid																	
2 fuses																	
3 sockets																	
a. Edison key socket																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 bcx	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
b. keyless socket																	
4 light bulbs																	
5 insulators																	
a. large, for main pole																	
b. small, for inside house																	
1 porcelain tubes																	
2 porcelain insulators																	
3 porcelain cleats																	
a. one wire																	
b. two wire																	
c. three wire																	
E. telephone																	
1 telephone batteries																	
F. fixed heating, cooling, atmospheric conditioning																	
1 stoves/furnaces	3	1		2			5						1				
2 steam pipe																	
3 stove pipe & accessories	4						3	5				3	21				
4 stove floor bracings																	
G. wiring fixtures																	
H. private communication																	
1 door bell																	
"Architecture" sub-total:	1533	114	21	2	0	0	513	132	2	0	225	605	297	480	0	0	62
4 PERSONAL AND DOMESTIC TRANSPORTATION																	
A. vehicles																	
1 horse/dog accouterments							1										

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
a. horseshoe																	
b. horseshoe nails	2											1					
c. horse/dog harness parts	37						3					2	1	1			
1 harness keep ring	2							1				1		1			
2 swivel snap																	
3 buckles	3	1					1										
4 other hardware	13						4				1	7					
2 vehicle accessories																	
a. chains																	
b. fixtures/accessories																	
c. wagon pin																	
d. wheel																	
e. sled parts	2																
B. maintenance																	
1 bailing wire	2						10				1	2		1			
2 pine tar	1																
C. ritual																	
"Transportation" sub-total:	62	1	0	0	0	0	19	1	0	0	2	13	1	3	0	0	0
5 COMMERCE AND INDUSTRY																	
A. agriculture																	
B. hunting	1						1				1	1					
1 guns																	
a. associated hardware												1					
2 ammunition																	
a. cap																	
b. cartridge	78	2	1				7	1		2		31	22	7			
c. live round	13	1									2	16		2			

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
d. lead shot	1											3					
e. primer cap	4											11		4			
f. shotgun shell											1	4					
g. shotgun wadding												9					
h. bullet	3											3		2			
C. fishing																	
1 hooks												1					
2 sinkers																	
3 lures	1						1					1					
4 rods																	
5 ice pick																	
D. gathering																	
1 berry brush	1																
E. trapping																	
F. logging																	
G. mining																	
1 steam point																	
2 high pressure hose																	
H. construction																	
1 tools																	
a. hammer																	
b. drills																	
c. wrenches																	
d. pliers																	
e. shovels																	
f. plumb bob																	
g. files	2	1	1				1	1				2					
h. drill bits	1																
i. screwdrivers																	
j. saw blades	3							1				1					

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
k. trowels	1																
l. paint brush	1																
m. knife																	
n. chisel								1									
o. whetstone							1	1									
p. soldering iron								1									
q. ax head													1				
r. plane														1			
s. pick ax																	
t. wire/cable cutter																	
I. manufacturing																	
1 handicraft	8											2	1	1			
2 industrial																	
J. commercial services																	
1 advertising signs							1										
2 storage																	
a. barrel hoops							1						1				
b. staves																	
3 entertainment																	
4 beverages																	
5 record keeping																	
a. receipts																	
b. ledgers														1			
c. binders, clipboards																	
d. paper clips														1			
"Commerce & Industry" sub-total:	118	4	2	0	0	0	13	6	0	2	4	86	25	19	0	0	0
6 GROUP SERVICES																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
A. banking/monetary system																	
1 bank drafts																	
2 miners poke																	
3 scale accessories																	
B. public administration																	
1 taxation																	
2 stamp																	
3 international customs																	
7 GROUP RITUAL																	
8 UNKNOWN/UNCLASSIFIED																	
A. glass fragments														3			
1 bottles	95	5					3	2			1	3	11	1		1	4
2 other	30	2					9				2	3	1	3			2
3 melted and unid.	3													1			
4 unid. thin clear glass	74	25	2				1					2		20			1
B. sheet metal fragments	103	2	4	6	2		36	39			22	97	13	12			
C. miscellaneous metal	5							5			2	15	2	2			
1 wire	18	1	2				6	1			2	11	9	4			
a. cable	3																
2 cans (unk. function)																	
a. cans	49						24	3		1	7	1	41	3			1
b. can lids/ends	27						21	3		1	2	2	2	2			
c. bails			1				2						1				
3 hardware	19	2					2				3	8	2				
a. chain	5																
b. iron ring	1																
c. threaded keep ring																	
d. D-ring																	

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
e. gear																	
f. clasp																	
g. cable clamp							1										
h. spring																	
i. padlock							1										
j. unknown pipes								1									
4 metal lids (not cans)	4													1			
D. engine parts																	
1 spark plugs																	
2 gasket																	
3 muffler																	
E. plastic	2											1	1				
F. paper	3							1				1	1	11			
G. wood & charcoal frags	77						5	1									
H. coal																	
I. faunal remains (non-food)											1						
J. OTHER	1							1				3					
K. ceramic	5	7									1		1				
L. textiles	2							2									
1 woven	8						4	19			1		17	1			1
2 felt	1											2					
3 rubberized													11				
M. synthetic viscous liquid	2																
1 oil																	
N. leather	33	1					26	1				44		3			
O. cordage	1																
1 twine																	
P. foil	29						17	2				8		3			
Q. cork																	
R. rubber	11						3					1	5	3			

Table E.1 Artifact inventory.

	CF1 other	CF1 entry	CF1 box	CF1 TP2	CF1 TP3	CF1 F.1-3	CF3 all	CF4 other	CF4 box	CF4 spoil	CF5 fill	CF5 L4	CF6 all	CF7 found.	CF7 TP1	CF11 surface	CF11 fill
S. lithic	8		1			1	1										
T. ivory																	
"Other/Unidentified" sub-total:	619	45	10	6	2	1	162	81	0	2	44	202	118	73	0	1	9
TOTAL ARTIFACTS:	3488	219	55	8	2	2	1316	294	2	6	366	1193	832	713	51	11	138

Note: CF1 Fea.1-3 the food bones' (2B1a1) total not computed. Only associated artifacts in table.

Note: CF3 bottle glass counts (alcohol, medicine, condiments, 8A1, etc.) are MNI totals, not glass fragments totals.

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
1 PERSONAL ITEMS															
A. clothing															
1 hardware		3				1									
a. buttons		33				30							32		
b. snaps		1				1									
c. (space empty)															
d. garter															
e. suspender		9				1							1		
f. buckles		1													
g. (space empty)															
h. zipper													2		
i. rivet		1				12							2		
j. hinged clasp		3											2		
k. cuff link		1											1		
2 textile/cloth/leather						1		1					3		
a. shirt													3		
b. suspender strap															
3 belt								7							
4 glove															
5 mitten															
6 labels															
B. footwear															
1 shoes					1								2		
2 boots													5		1
3 footwear hardware		4				1							2	1	
a. shoe nails													100		
b. heel stiffeners															
c. heel plates															
C. adornment		1													
1 rings															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
2 pins		2													
3 chains		1													
4 beads	12	494				2							1263		
5 pendants															
D. body ritual & grooming															
1 dental care															
a. toothbrush		1													
b. toothpaste & powder	1														
c. mouthwash															
2 hair care															
a. combs		2													
b. brushes															
c. scissors															
d. razors															
e. shaving mugs															
f. curling irons															
g. shampoo															
h. shaving accessories															
i. bobby pins		4				2									
j. hair pin		1													
3 perfumes, toilet waters															
a. talc															
b. perfume															
4 mirror (personal, handheld)															
5 makeup															
E. medical and health															
1 patent/pharmacy medicine										1					
a. tins		1											1		
b. bottles & jars		1			6										
1 stoppers															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
c. tubes		1											2		
2 syringe													1		
3 thermometer															
4 eyeglasses															
5 hotwater bottle															
6 protective eyewear		3													
F. birth control															
G. indulgences															
1 candy/gum															
2 smoking															
a. tobacco tins	4	4		1	16	15									
b. pipes		1											1		
c. cigarettes						1									
3 snuff & chewing tobacco															
a. tins		1			5	2							1		
b. plug stamps		4													
4 alcohol						2							27		
a. beer		10		12	67	69	4						44		2
b. wine															
c. distilled						14			1		8		1		1
d. alcohol stopper/closure		1			1	2							5		
H. pastimes & recreation															
1 writing utensils													1		
a. pencil	1	8				1									
1 eraser															
2 shaft		2													
3 ferrule															
4 pencil lead		1													
b. pen															
c. ink well															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
d. ink bottle															
e. paint brush													6		
f. chalk		1											1		
2 musical instrument															
a. harmonica		3													
3 toys		2											2		
a. marble		4													
b. doll		7													
c. crayon		9													
d. child's ceramic tea set		1													
4 audio playback															
a. record						1							1		
b. record player															
c. music box															
5 games													1		
a. poker chips	1	3													
b. dice															
c. playing card															
I. ritual personal															
1 religious medallions															
2 crucifix															
3 rosary beads															
J. pocket tools & accessories															
1 purse/wallet															
2 whetstone															
3 pocketknife						1									
4 watch		4											1		
a. chain		1													
b. band															
1 buckle															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
K. infant care															
L. luggage															
M. storage (e.g., trunks)														1	
N. money															
1 coins															
2 currency tokens													2		
"Personal" sub-total:	19	635	0	13	96	159	4	8	1	1	8	0	1516	2	4
2 DOMESTIC ITEMS															
A. furnishings													8		
1 carpet													5		
2 linoleum															
3 wallpaper, contact paper															
4 tile															
5 furniture & parts	1					29		1	2				2		
a. spring		3				1									
6 time keeping devices															
a. gears	2	2													
b. face															
c. hardware	2	1													
7 curtain related													1		
8 table cloth															
9 venetian blind holders													6		
10 shelf													1		
11 (space empty)															
12 wall/bureau mirror		1				4									
13 furnishing tacks		9				12							11		
B. housewares & appliances															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
1 culinary (food prep.)															
a. food waste															
1 food bones	9	12		2	3	23	4						123	7	
2 food shells		2			1								11		
3 pits/seeds		3				1							2		
b. storage															
1 burlap sacks															
c. kitchen appliances															
1 grinder		1											4		
a. spice grinder															
2 shaker															1
d. food, condiment & beverage containers						1									
1 beverage						2							1		
a. soda-pop						6		1							
b. water															
2 condiments													1		
a. mustard															
b. ketchup					13								4		1
c. worchester															
d. spices															
3 food (cans, except a)		2		8	236	1							12		
a. canning jars													26		
b. coffee	1	2			2								3		
b/l coffee or butter															
c. tea		1													
d. baking powder				1									3		
e. cooking oil				1	2										
f. fruit/vegetable					10										
g. crystallized egg				3	6										

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
h. butter	2	3		5	12								2		
i. starch		1			2										
j. condensed milk				2	50										
j/n cond./evap'd milk				1		3							1		
k. lard		1			2									2	
l. meat/fish/bacon				2	38		1						1		
m. maple syrup															
n. evaporated milk	1	1		3	131		1								
o. corn syrup					1										
e. cooking pots & pans															
1 skillet															1
2 bread pan															
3 coffee pot														1	
4 cook pot		1			2									1	
5 pot lid													4		1
6 rectangular pan															
7 circular pan															
8 tea pot/kettle															1
f. cooking utensils															
1 knives													1		
2 spatula															
3 measuring cup															
4 ladle															
5 skimmer															
6 strainer													1		
7 big cooking spoon												1			
g. bottle & can openers													1		
1 turn key		1			1	1	1						1		
a. turn key strip		1			2										
2 church key						2							1		

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
3 corkscrew						1							1		
4 butterfly clasp															
5 crown cap opener						1							1		
h. closers															
1 stoppers						2							1		
2 caps		1				3							2		
3 seals															
2 gustatory (food eating)		1													
a. food					40										
1 plates				1		2							1	5	1
2 bowls		1			1	42	1								
3 saucers															
4 (space empty)															
5 table utensils															
a. knife		1											1		
b. fork													2		
c. spoon						2							2	1	
b. beverage															
1 drinking glasses		1			4	1							1		
2 swizzle sticks															
3 pitcher															
4 cups					2								17		
3 portable illumination															
a. batteries						1							3		
b. flashlight & accessories															
c. lantern						1									
1 associated parts		6											1		
2 chimney glass													5		
d. candle		1													
e. lamp															1

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
f. matchstick		1													
4 portable waste disposal & sanitation															
a. wash basin													97	1	3
5 portable heating/cooking															
a. portable stove/heater													2		
b. fuel cans	1	6			1	1							8		
6 domestic ritual															
7 household pastimes															
8 home education, information, business													3		
a. reading material													1		
b. magazine															
c. book													1		
d. newspaper	1												4		
9 non-kitchen appliances															
a. electrical plug															
b. receptacle															
C. cleaning and maintenance															
1 cleaning		1													
a. scrub brush													1		
2 household maintenance		1											1		
a. thumb tack						3									
3 laundry								1							1
a. hangers	1					7							1		
b. cloths pins															
c. iron															
4 sewing		2													
a. thimbles															
b. needles		1													

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
c. pins															
1 straight		1													
2 safety		8											3		
d. bodkin/awl													1		
5 pest control															
a. fly swatter															
b. mouse trap															
1 spring						1							1		
6 scraps															
"Domestic" sub-total:	21	81	0	29	562	154	8	3	2	0	0	1	399	18	11
3 ARCHITECTURE															
A. structures															
B. construction															
1 materials						3							5		
a. window															
1 glass panes	2	75			1	483		5		5			392		
2 glazier points															
3 caulking		1				12							74		
4 wire window screen					10	1				1			3		
b. interior															
1 plaster															
2 oil cloth		9											7		
c. exterior roofing & walls															
1 sheet metal															
a. flat metal						1									
b. corrugated													2		
2 shingles															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
a. wood															
b. metal		2											1		
3 tar & building paper	1	17				8		30					5		
a. fastener						5									
d. miscellaneous															
1 paint		1				1							4		
e. foundation															
1 metal flashing													21		
2 hardware													1		
a. fasteners						1									
1 nails		1													
a. regular wire	13	231			11	1121	6	41		1			807		
b. finishing		4				28							2		
c. roofing						28									
d. machine cut		3			1								18		
e. hand-wrought															
2 screws															
a. metal													4		
b. wood		1				2							4		
3 cotter pin		4													
4 hooks and eyes	2	1				1							20		
5 brass fitting		1													
6 staples													7		
7 rivet													2		
8 nuts & bolts		1				5							118		
9 rod															
10 (space empty)															
11 washer		2				3							14		
12 grommet		8				1							3		
13 metal strapping		3											7		

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
14 locking pin													3		
15 small truss plate															
b. hinges		3				3							12		
1 hinge pin						2							5		
2 hinge ball															
c. nailers		12			10	11	2						5		
d. braces/brackets/flanges		2				1							7		
e. metal stock			1										3		
f. door fixtures		1				1							5		
1 locks		1											1		
a. lock key													1		
2 knob handles													2		
3 strike plates					1	1									
g. cabinet fixtures						1									
1 latch hardware		1											4		
2 knobs													5		
C. plumbing													1		
1 pipes															
2 drain															
3 spigot															
4 valves															
5 fittings/couplings															
a. spring coupling															
D. fixed illumination & power															
1 wire															
a. braided															
b. solid															
2 fuses															
3 sockets															
a. Edison key socket															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
b. keyless socket															
4 light bulbs															
5 insulators															
a. large, for main pole															
b. small, for inside house															
1 porcelain tubes															
2 porcelain insulators															
3 porcelain cleats															
a. one wire															
b. two wire															
c. three wire															
E. telephone															
1 telephone batteries						1									
F. fixed heating, cooling, atmospheric conditioning															
1 stoves/furnaces													23		2
2 steam pipe															
3 stove pipe & accessories		1				1							4		3
4 stove floor bracings															
G. wiring fixtures								1							
H. private communication															
1 door bell															
"Architecture" sub-total:	18	386	1	0	34	1726	8	77	0	7	0	0	1602	0	5
4 PERSONAL AND DOMESTIC TRANSPORTATION															
A. vehicles															
1 horse/dog accouterments													1		

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
a. horseshoe															
b. horseshoe nails		1				2							96		
c. horse/dog harness parts	5	6		3	1	5							27		2
1 harness keep ring		1				1							19		
2 swivel snap															
3 buckles					1								7		
4 other hardware		1		1									8		2
2 vehicle accessories															
a. chains															
b. fixtures/accessories													4		
c. wagon pin															1
d. wheel													1		
e. sled parts						1							15		4
B. maintenance													1		
1 bailing wire	1					3							5		
2 pine tar													6		
C. ritual															
"Transportation" sub-total:	6	9	0	4	2	12	0	0	0	0	0	0	190	0	9
5 COMMERCE AND INDUSTRY															
A. agriculture													1		1
B. hunting	1									1					
1 guns		1						1							
a. associated hardware						1		1					1		
2 ammunition															
a. cap															
b. cartridge	3	32			1	4							3		
c. live round	4	23								1			3		

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
d. lead shot	105	99											128		
e. primer cap															
f. shotgun shell	4	2													
g. shotgun wadding	4														
h. bullet															
C. fishing															
1 hooks		1													
2 sinkers															
3 lures		1											1		
4 rods															
5 ice pick															
D. gathering															
1 berry brush															
E. trapping		1											1		
F. logging															
G. mining													1		1
1 steam point															
2 high pressure hose															
H. construction													1		
1 tools		1				1							1		
a. hammer															
b. drills															
c. wrenches													1		
d. pliers															
e. shovels															
f. plumb bob															
g. files		2											7		
h. drill bits													1		
i. screwdrivers															
j. saw blades													5		

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
k. trowels															
l. paint brush													4		
m. knife															
n. chisel													1		
o. whetstone													1		
p. soldering iron															
q. ax head															
r. plane															
s. pick ax															1
t. wire/cable cutter															
I. manufacturing															
1 handicraft		1											2		1
2 industrial															
J. commercial services															
1 advertising signs															
2 storage								1					12		
a. barrel hoops					1	1							4		
b. staves		1											1		
3 entertainment															
4 beverages															
5 record keeping															
a. receipts															
b. ledgers															
c. binders, clipboards															
d. paper clips															
"Commerce & Industry" sub-total:	121	165	0	0	2	7	0	3	0	2	0	0	180	0	4
6 GROUP SERVICES															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
A. banking/monetary system															
1 bank drafts															
2 miners poke															
3 scale accessories															
B. public administration															
1 taxation															
2 stamp															
3 international customs															
7 GROUP RITUAL															
8 UNKNOWN/UNCLASSIFIED															
A. glass fragments															
1 bottles		18			1	31							15		
2 other		15				10							8		
3 melted and unid.		1				33									
4 unid. thin clear glass	4	82			2	5	1						13		
B. sheet metal fragments		19		2	3	120	4	2					638		1
C. miscellaneous metal						4	3						94		1
1 wire	2	5				14	4	1		1			24		
a. cable													1		
2 cans (unk. function)															
a. cans		2	1		123	31	1						21		
b. can lids/ends	1	1			8	15	1						9		
c. bails				1	1	1									
3 hardware		16		2		7		1					17		
a. chain															
b. iron ring		1				3							2		
c. threaded keep ring															
d. D-ring															

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
e. gear		1													
f. clasp		1											1		
g. cable clamp													2		
h. spring						1									
i. padlock															
j. unknown pipes		1									1		7		2
4 metal lids (not cans)															
D. engine parts															
1 spark plugs															
2 gasket															
3 muffler															
E. plastic													2		
F. paper		20				1							13		
G. wood & charcoal frags		2						1					3		
H. coal						3									
I. faunal remains (non-food)	1														
J. OTHER		2				1							14		
K. ceramic		5				3							4		
L. textiles													1		
1 woven		15				1							18		
2 felt		1				1							1		
3 rubberized		1				3							4		
M. synthetic viscous liquid															
1 oil															
N. leather		7				2							7		
O. cordage															
1 twine															
P. foil	2	17		1	1	1							6		
Q. cork															
R. rubber						2							3		

Table E.1 Artifact inventory.

	CF14 cellar	CF14 other	CF14 TP1	CF16 all	CF10 all	T1 L1-2	T1 L3	T1 box	T1 TP1	T1 TP2	T1 TP3	T1 TP4	W1 found	W1 bench	surface around W1
S. lithic		2				21							2		
T. ivory	1														
"Other/Unidentified" sub-total:	11	235	1	6	139	314	14	5	0	1	1	0	930	0	4
TOTAL ARTIFACTS:	196	1511	2	52	835	2372	34	96	3	11	9	1	4817	20	37

Note: CF1 Fea.1-3 the food bones' (2

Note: CF3 bottle glass counts (alcoh

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
1 PERSONAL ITEMS		0
A. clothing		0
1 hardware		8
a. buttons		199
b. snaps		8
c. (space empty)		
d. garter		0
e. suspender		21
f. buckles		4
g. (space empty)		
h. zipper		2
i. rivet		28
j. hinged clasp		5
k. cuff link		8
2 textile/cloth/leather		10
a. shirt		3
b. suspender strap		5
3 belt		8
4 glove		2
5 mitten		1
6 labels		0
B. footwear		0
1 shoes		4
2 boots		27
3 footwear hardware		63
a. shoe nails		100
b. heel stiffeners		0
c. heel plates		1
C. adornment		1
1 rings		1

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
2 pins		5
3 chains		1
4 beads		2054
5 pendants		1
D. body ritual & grooming		0
1 dental care		0
a. toothbrush		2
b. toothpaste & powder		3
c. mouthwash		0
2 hair care		0
a. combs		16
b. brushes		0
c. scissors		0
d. razors		0
e. shaving mugs		0
f. curling irons		0
g. shampoo		0
h. shaving accessories		1
i. bobby pins		9
j. hair pin		4
3 perfumes, toilet waters		0
a. talc		0
b. perfume		0
4 mirror (personal, handheld)		1
5 makeup		0
E. medical and health		0
1 patent/pharmacy medicine		2
a. tins		3
b. bottles & jars		15
1 stoppers		1

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
c. tubes	1	8
2 syringe		1
3 thermometer		0
4 eyeglasses		0
5 hotwater bottle		0
6 protective eyewear		6
F. birth control		0
G. indulgences		0
1 candy/gum		0
2 smoking		0
a. tobacco tins	1	103
b. pipes		5
c. cigarettes		1
3 snuff & chewing tobacco		0
a. tins		41
b. plug stamps		26
4 alcohol		30
a. beer	1	681
b. wine		11
c. distilled		27
d. alcohol stopper/closure		21
H. pastimes & recreation		2
1 writing utensils		1
a. pencil		17
1 eraser		0
2 shaft		2
3 ferrule		1
4 pencil lead		7
b. pen		0
c. ink well		1

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
d. ink bottle		0
e. paint brush		7
f. chalk		12
2 musical instrument		0
a. harmonica		4
3 toys		4
a. marble		11
b. doll		8
c. crayon		9
d. child's ceramic tea set		1
4 audio playback		0
a. record		7
b. record player		0
c. music box		0
5 games		1
a. poker chips		71
b. dice		0
c. playing card		0
I. ritual personal		0
1 religious medallions		0
2 crucifix		0
3 rosary beads		0
J. pocket tools & accessories		2
1 purse/wallet		0
2 whetstone		0
3 pocketknife	1	3
4 watch		7
a. chain		2
b. band		0
1 buckle		0

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
K. infant care		0
L. luggage		0
M. storage (e.g., trunks)		1
N. money		0
1 coins		8
2 currency tokens		4
"Personal" sub-total:	4	3785
2 DOMESTIC ITEMS		0
A. furnishings		9
1 carpet		5
2 linoleum		0
3 wallpaper, contact paper		0
4 tile		0
5 furniture & parts		77
a. spring		4
6 time keeping devices		0
a. gears		8
b. face		2
c. hardware		11
7 curtain related		2
8 table cloth		0
9 venetian blind holders		6
10 shelf		1
11 (space empty)		
12 wall/bureau mirror		5
13 furnishing tacks		40
B. housewares & appliances		0

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
1 culinary (food prep.)		0
a. food waste		0
1 food bones	1	786
2 food shells		31
3 pits/seeds		116
b. storage		0
1 burlap sacks		0
c. kitchen appliances		0
1 grinder		5
a. spice grinder		0
2 shaker		1
d. food, condiment &		0
beverage containers		1
1 beverage		5
a. soda-pop		7
b. water		0
2 condiments		6
a. mustard		0
b. ketchup		27
c. worchester		4
d. spices		0
3 food (cans, except a)		467
a. canning jars		61
b. coffee		40
b/l coffee or butter		7
c. tea		1
d. baking powder		18
e. cooking oil		5
f. fruit/vegetable		11
g. crystallized egg		13

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
h. butter		56
i. starch		6
j. condensed milk		110
j/n cond./evap'd milk		13
k. lard		14
l. meat/fish/bacon		98
m. maple syrup		1
n. evaporated milk		199
o. corn syrup		2
e. cooking pots & pans		0
1 skillet		1
2 bread pan		1
3 coffee pot		1
4 cook pot	1	4
5 pot lid		7
6 rectangular pan		1
7 circular pan		1
8 tea pot/kettle		1
f. cooking utensils		1
1 knives		4
2 spatula		0
3 measuring cup		0
4 ladle		0
5 skimmer		0
6 strainer		1
7 big cooking spoon	1	1
g. bottle & can openers		2
1 turn key		66
a. turn key strip		21
2 church key		3

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
3 corkscrew		2
4 butterfly clasp		0
5 crown cap opener		2
h. closers		0
1 stoppers		3
2 caps		14
3 seals		3
2 gustatory (food eating)		1
a. food		71
1 plates		12
2 bowls		45
3 saucers		0
4 (space empty)		
5 table utensils		1
a. knife		4
b. fork		3
c. spoon		11
b. beverage		1
1 drinking glasses		19
2 swizzle sticks		2
3 pitcher		0
4 cups		35
3 portable illumination		0
a. batteries		9
b. flashlight & accessories		0
c. iantem		1
1 associated parts		10
2 chimney glass		28
d. candle		5
e. lamp		2

Table E.1 Artifact Inventory.

	metal det. around W1	TOTALS
f. matchstick		1
4 portable waste disposal		0
& sanitation		0
a. wash basin		103
5 portable heating/cooking		1
a. portable stove/heater		3
b. fuel cans	3	47
6 domestic ritual		0
7 household pastimes		0
8 home education,		0
information, business		3
a. reading material		1
b. magazine		0
c. book		1
d. newspaper		25
9 non-kitchen appliances		0
a. electrical plug		0
b. receptacle		0
C. cleaning and maintenance		0
1 cleaning		1
a. scrub brush		1
2 household maintenance		4
a. thumb tack		3
3 laundry		2
a. hangers		10
b. cloths pins		3
c. iron		0
4 sewing		6
a. thimbles		0
b. needles		1

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
c. pins		0
1 straight		3
2 safety		23
d. bodkin/awl		2
5 pest control		0
a. fly swatter		0
b. mouse trap		0
1 spring		3
6 scraps		0
"Domestic" sub-total:	6	2934
3 ARCHITECTURE		0
A. structures		0
B. construction		0
1 materials		10
a. window		0
1 glass panes	1	1798
2 glazier points		0
3 caulking		100
4 wire window screen		15
b. interior		0
1 plaster		0
2 oil cloth		55
c. exterior roofing & walls		0
1 sheet metal		0
a. flat metal		4
b. corrugated		2
2 shingles		0

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
a. wood		0
b. metal		21
3 tar & building paper		650
a. fastener		5
d. miscellaneous		0
1 paint		7
e. foundation		0
1 metal flashing	1	21
2 hardware		1
a. fasteners		8
1 nails		240
a. regular wire	1	4108
b. finishing		38
c. roofing		31
d. machine cut		54
e. hand-wrought		0
2 screws		4
a. metal		6
b. wood		24
3 cotter pin		4
4 hooks and eyes		33
5 brass fitting		1
6 staples		12
7 rivet		4
8 nuts & bolts		155
9 rod		0
10 (space empty)		
11 washer		37
12 grommet		24
13 metal strapping	1	12

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
14 locking pin		7
15 small truss plate		0
b. hinges		26
1 hinge pin		10
2 hinge ball		0
c. nailers		168
d. braces/brackets/flanges	1	17
e. metal stock	1	20
f. door fixtures		9
1 locks		2
a. lock key		3
2 knob handles		3
3 strike plates		2
g. cabinet fixtures		1
1 latch hardware		7
2 knobs		6
C. plumbing		1
1 pipes		0
2 drain		0
3 spigot		0
4 valves		0
5 fittings/couplings		0
a. spring coupling		0
D. fixed illumination & power		0
1 wire		0
a. braided		0
b. solid		0
2 fuses		0
3 sockets		0
a. Edison key socket		0

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
b. keyless socket		0
4 light bulbs		0
5 insulators		0
a. large, for main pole		0
b. small, for inside house		0
1 porcelain tubes		0
2 porcelain insulators		0
3 porcelain cleats		0
a. one wire		0
b. two wire		0
c. three wire		0
E. telephone		0
1 telephone batteries		1
F. fixed heating, cooling,		0
atmospheric conditioning		0
1 stoves/furnaces		37
2 steam pipe		0
3 stove pipe & accessories		45
4 stove floor bracings		0
G. wiring fixtures		1
H. private communication		0
1 door bell		0
"Architecture" sub-total:	6	7856
4 PERSONAL AND		0
DOMESTIC TRANSPORTATION		0
A. vehicles		0
1 horse/dog accouterments	2	2

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
a. horseshoe		0
b. horseshoe nails		102
c. horse/dog harness parts		93
1 harness keep ring		26
2 swivel snap		0
3 buckles		13
4 other hardware		37
2 vehicle accessories		0
a. chains		0
b. fixtures/accessories	1	4
c. wagon pin		1
d. wheel		1
e. sled parts	4	22
B. maintenance		1
1 bailing wire		25
2 pine tar		7
C. ritual		0
"Transportation" sub-total:	7	341
5 COMMERCE AND INDUSTRY		0
A. agriculture		2
B. hunting		6
1 guns		2
a. associated hardware		4
2 ammunition		0
a. cap		0
b. cartridge		194
c. live round		65

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
d. lead shot		336
e. primer cap		19
f. shotgun shell		11
g. shotgun wadding		13
h. bullet		8
C. fishing		0
1 hooks		2
2 sinkers		0
3 lures		5
4 rods		0
5 ice pick		0
D. gathering		0
1 berry brush		1
E. trapping		2
F. logging		0
G. mining		2
1 steam point		0
2 high pressure hose		0
H. construction		1
1 tools		3
a. hammer		0
b. drills		0
c. wrenches		1
d. pliers		0
e. shovels		0
f. plumb bob		0
g. files	1	17
h. drill bits		2
i. screwdrivers		0
j. saw blades		10

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
k. trowels		1
l. paint brush		5
m. knife		0
n. chisel		2
o. whetstone		3
p. soldering iron		1
q. ax head		1
r. plane		1
s. pick ax		1
t. wire/cable cutter		0
I. manufacturing		0
1 handicraft		16
2 industrial		0
J. commercial services		0
1 advertising signs		1
2 storage		13
a. barrel hoops	4	8
b. staves		2
3 entertainment		0
4 beverages		0
5 record keeping		0
a. receipts		0
b. ledgers		1
c. binders, clipboards		0
d. paper clips		1
"Commerce & Industry" sub-total:	5	768
6 GROUP SERVICES		0

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
A. banking/monetary system		0
1 bank drafts		0
2 miners poke		0
3 scale accessories		0
B. public administration		0
1 taxation		0
2 stamp		0
3 international customs		0
7 GROUP RITUAL		0
8 UNKNOWN/UNCLASSIFIED		0
A. glass fragments		3
1 bottles		191
2 other		85
3 melted and unid.		38
4 unid. thin clear glass		232
B. sheet metal fragments	4	1125
C. miscellaneous metal	3	133
1 wire	8	105
a. cable		4
2 cans (unk. function)		0
a. cans	11	309
b. can lids/ends		95
c. bails		7
3 hardware	1	79
a. chain		5
b. iron ring		7
c. threaded keep ring	1	0
d. D-ring		0

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
e. gear		1
f. clasp		2
g. cable clamp		3
h. spring		1
i. padlock		1
j. unknown pipes		12
4 metal lids (not cans)		5
D. engine parts		0
1 spark piugs		0
2 gasket		0
3 muffler		0
E. plastic		6
F. paper		51
G. wood & charcoal frags		89
H. coal		3
I. faunal remains (non-food)		2
J. OTHER		22
K. ceramic		26
L. textiles		5
1 woven		85
2 felt		6
3 rubberized		19
M. synthetic viscous liquid		2
1 oil		0
N. leather	1	124
O. cordage		1
1 twine		0
P. foil		87
Q. cork		0
R. rubber		28

Table E.1 Artifact inventory.

	metal det. around W1	TOTALS
S. lithic		36
T. ivory		1
"Other/Unidentified" sub-total:	29	3065
TOTAL ARTIFACTS:	57	18749

Note: CF1 Fea.1-3 the food bones' (2

Note: CF3 bottle glass counts (alcoh

Table E.2 Minimum number of individual bottles and jars, from Coldfoot, Tofty, and Wiseman. See function and color KEYS, below.

		bases MNI	lips MNi	weight MNI	=	MNI
Coldfoot Feature 1						
1E1b	color 1	0	0	1	=	1
1E1c	color 1	1	1	1	=	1
1G4a	color 6	1	1	1	=	1
1G4a	color 7	2	2	2	=	1
1G4a	color 21 & 22	1	1	1 (2?)	=	1
1G4a	color 22	1	1	1	=	1
1G4a	color 32	2	4	2	=	4
1G4a	color 31	1	1	1	=	1
1G4b	color 11	1	0	1	=	1
2B1d2b	color 39	2	2	2	=	2
2B1d2c	color 4	2	2	2	=	2
8A1	color 1	0	0	1	=	1
8A1	color 4	2	0	1	=	2
8A1	color 10	0	1	1	=	1
8A1	color 14	0	0	1	=	1
8A1	color 17	0	0	1	=	1
8A1/8A2	color 2	1	0	1	=	1

Coldfoot Feature 4						
8A1	color 1	0	0	1	=	1
8A1	color 11	0	1	1	=	1

Coldfoot Feature 5						
1E1b	color 1	1	1	1	=	1
8A1	color 1	0	0	1	=	1
8A1	color 32	0	0	1	=	1

		bases MNI	lips MNi	weight MNI	=	MNI
Coldfoot Feature 3						
1E1b	color 21 & 22	1	1	1	=	1
1G4	color 14	1	0	1	=	1
1G4a	color 21 & 22	7	5	?*	=	7
1G4a	color 31	1	1	?*	=	1
1G4a	color 32	5	5	?*	=	5
1G4c	color 13	0	0	1	=	1
2B1d2b	color 1	1	0	1	=	1
2B1d2c	color 21 & 22	1	1	1	=	1
8A1	color 4	3	1	?*	=	3
8A1/8A2	color 2	1	0	1	=	1

* Body fragments disposed of prior to weighing.

Coldfoot Feature 6						
1E1b	color 2	1	1	1	=	1
1G4a	color 4	0	1	1 (2?)	=	1
1G4a	color 22	7	7	8	=	8
1G4a	color 32	2	1	2	=	2
8A1	color 2	1	1	1	=	1
8A1	color 6	1	0	1	=	1

Coldfoot Feature 7						
1G4a	color 21	0	0	1	=	1
8A1	color 31	0	0	1	=	1

Table 2.2 Minimum Number of Individual Bottles and Jars, Coldfoot, Tofty, and Wiseman. See function and color KEYS, below (continued).

		bases MNI	lips MNI	weight MNI	=	MNI
Coldfoot Feature 14						
1E1b	color 1	0	0	1	=	1
1G4a	color 21	0	0	1	=	1
8A1	color 4	0	0	1	=	1
8A1	color 32	2	1	1	=	2
Coldfoot Feature 11						
1G4a	color 6	1	1	1	=	1
1G4a	color 9	3	3	3	=	3
1G4a	color 22	0	1	1	=	1
1G4a	color 32	2	1	2	=	2
1G4c	color 31	1	0	1	=	1
8A1	color 4	0	0	1	=	1
8A1	color 10	0	1	1	=	1

Tofty Feature 1						
2B1d1a	color 6	2	2	2	=	2
1G4	color 1	1	0	1	=	1
1G4a	color 6	2	2	2	=	2
1G4a*	color 7	1	1	1	=	1
1G4a*	color 21 & 22	1	0	1	=	1
1G4a	color 32	1	1	1	=	1
1G4c	color 1	2	2	3	=	3
1G4a	color 39	0	1	1	=	1
8A1	color 1	0	0	1	=	1
8A1	color 2	1	0	1	=	1
8A1	color 4	0	0	1	=	1
8A1	color 9	0	0	1	=	1
8A1	color 32	0	1	1	=	1

*Associated with "pole" feature below foundation.

		bases MNI	lips MNI	weight MNI	=	MNI
Coldfoot Feature 10						
1G4a	color 4	2	0	1	=	2
1G4a	color 7	0	1	1	=	1
1G4a	color 21 & 22	2	2	2	=	2
1G4a	color 32	0	0	1	=	1
2B1d2b	color 1	1	0	1	=	1
2B1d2b	color 2	1	0	1	=	1
8A1	color 6	0	0	1	=	1

Wiseman Feature 1						
2B1d2	color 1	1	1	1	=	1
2B1d2b*	color 1	1	1	1	=	1
2B1d3a	color 2	1	1	1	=	1
2B1d3a	color 22	1	1	1	=	1
1G4	color 6	1	1	1?	=	1
1G4c	color 1	1	1	1	=	1
1G4a	color 31	1	1	1	=	1
1G4a	color 32	7	9	7	=	9
1G4c*	color 1	2	2	2	=	2
1G4a*	color 22	1	1	1	=	1
1G4a*	color 32	2	2	2	=	2
1G4c*	color 32	1	1	1	=	1
1G4c*	color 39	1	1	1	=	1
8A1	color 1	1	0	1	=	1

*From associated trash scatter ca. 25 m west of foundation.

Table 2.2 Minimum Number of Individual Bottles and Jars, Coldfoot, Tofty, and Wiseman. See function and color KEYS, below (continued).

		bases MNI	lips MNI	weight MNI	=	MNI
Coldfoot Feature 16						
1G4a	color 22	0	0	1	=	1
1G4a	color 32	0	1	1	=	1

		bases MNI	lips MNI	weight MNI	=	MNI
Coldfoot Feature 17						
1G4a	color 22	1	1	1	=	1
1G4a	color 32	1	0	1	=	1

KEYS:

1E1b=	medicine bottle
1E1c=	medicine tube
1G4=	unidentified alcohol bottle
1G4a=	beer bottle
1G4b=	wine bottle
1G4c=	distilled alcohol bottle
2B1d1a=	beverage, soda-pop
2B1d2=	unidentified condiment
2B1d2b=	ketchup
2B1d2c=	worchester sauce
2B1d3a=	canning jar
8A1=	unidentified bottle
8A1/8A2=	(here:) unidentified bottle or jar

color 1 =clear
color 2 =clear, manganese
color 4 =very light green
color 6 =clear medium green
color 7 =clear bluish green
color 9 =clr very lt. yellow green)
color 10 =very light green
color 11 =light green
color 13 =olive green
color 14 =dark green
color 17 =lime green
color 21 & 22 =lt.-aqua blue
color 22 =medium blue/aqua
color 31 =reddish amber
color 32 =amber
color 39 =clear, selenium

Appendix F. Manufacturers, brand names, and makers marks from Codlfoot, Tofty, and Wiseman artifacts.

ID	Maker's Mark or Brand Name	Maker, Distributor, or Parts Manfr.	Function	CF1	CF3	CF4
1	L.S. & CO.	Levi Strauss & Co., San Francisco, CA	1A1a	5	3	
2	Boss of the Road	Heynemann & Co., San Francisco, CA	1A1a			
3	Shirley President	??	1A1e			
4	L.S. CO.	Levi Strauss & Co., San Francisco, CA	1A1i	5		
5	Washburne (?)	Washburne, [?]	1A1j			
6	Dr Scholl's Foot-easer	??, U.S.A.	1B3			
7	[none]	[?], Hong Kong, British Territory	1C			
8	Hirsc...kahn\ Optic ... ..io Su..	Hirsc(h?) Kahn Optic(s?) (Stud)io, San Francisco CA	1C5	1		
9	Pepsodent	Pepsodent Co., Chicago, Toronto, London, Sydney	1D1b	2		
10	RIbbon Dental Cream	Colgate & Co., New York	1D1b			
11	Yankee Shaving Soap	American Can Co., San Francisco CA	1D2h	1		
12	Colgate's Violet Talc Powder	Colgate & Co., New York	1D3a			
13	Cashmere Bouquet	Colgate & Co., New York	1D3a			
14	Dabrooks Perfumes	Dabrook, [?]	1D3b			
15	White Vaseline	Chesebrough Manufacturing Co., New York, NY	1E1a			
16	Eno's	??, U.S.A.	1E1b			
17	(..)B & H N.Y.	[?], NY	1E1b			
18	Mentholatum	Mentholatum Co., Buffalo NY	1E1b			
19	Nuxated Iron	Diamond Glass Co., Royersford PA	1E1c	1		
20	Vaseline Petroleum Jelly	Chesebrough Mng. Co., New York, NY	1E1c			
21	Fresh Tuxedo Tobacco	American Tobacco Co., [?], VA	1G2a	1		
22	Velvet Tobacco	Liggett & Myers Tobacco Co., Durham, NC	1G2a	7	2	
23	Prince Albert Crimp Cut	R.J. Reynolds, Winston-Salem, NC	1G2a	1	3	
24	Lucky Strike	R.A. Patterson Tob Co, American Tob Co, Richmond VA	1G2a		2	1
25	Pattemson's Tuxedo	R.A. Patterson Tob Co, American Tob Co, Richmond VA	1G2a		1	1
26	Old English Curve Cut [pipe]	American Tobacco Co., [?], VA	1G2a			1
27	[none]	[?], New York NY	1G2a			
28	Egyptian Arab	(S.?) A. Khedive, Cairo, Egypte (?); The (..)urbrue(..) Manufactur(ing Co.?), New York, NY	1G2a			
29	W D C (in an inverted triangle)\ WELLINGTON	William Demuth Co., New York NY	1G2b	1		

Appendix F. Manufacturers, brand names, and makers marks from Codlfoot, Tofty, and Wiseman artifacts.

ID	Maker's Mark or Brand Name	Maker, Distributor, or Parts Manfr.	Function	CF1	CF3	CF4
30	Copenhagen	??	1G3a	1	1	
31	Edgeworth Extra High Grade Cut Plug	Larus & Bros. Co., Richmond Va	1G3a	3	4	
32	Lucky Strike Cut Plug	R.A. Patterson Tobacco Co., Richmond VA	1G3a		4	
33	J.G. Dill's Best Cut Plug	J.G. Dill Company, Richmond, VA.	1G3a		1	1
34	J.G. Dill's Best Cube Cut Plug	J.G. Dill Tobacco Co., Richmond, VA.	1G3a			
35	Westover Trademark	R.A. Patterson's Tobacco Co., Richmond VA	1G3b	2	3	
36	Arrowhead	N. & W. Tobacco Co., [?], U.S.A.	1G3b		2	
37	Battle Ax	American Tobacco Co., [?], VA	1G3b			
38	A B Co	American Bottling Co., various IL & OH	1G4a	2	1	
39	I.P.G. CO.	Illinois Pacific Glass Co. or Corp., San Francisco CA	1G4a	1		
40	AB [monogram]; Anheuser	Adolphus Busch Glass Mnfg. Co., St Louis MO (poss. Belleville IL)	1G4a	1	5	
41	A.B.G.M.Co.	Adolphus Busch Glass Mnfg. Co., St Louis MO (poss. Belleville IL)	1G4a			
42	ROOT	Root Glass Co., Terre Haute, IN	1G4a & 8A1		1	
43	S. G. CO.	(poss.) Safe Glass Co., Upland, IN	1G4a		1	
44	W F & S MILW, (prob. Pabst Blue Ribbon)	William Franzen & Son, Milwaukee, WI	1G4a & 8A1		1	
45	R & Co.	??	1G4a			
46	I. G. CO.	Illinois Glass Co., [?], IL	1G4a			
47	M.B. & G. Co.	Massillon Bottle & Glass Co., Massillon OH	1G4a			
48	S B & G Co	Streator Bottle & Glass Co., Streator IL	1G4a			
49	I	??	1G4a			
50	A	??	1G4a			
51	L	??	1G4a & 8A1			
52	20 [Owens-Illinois Symbol] #	Owens Illinois Pacific Coast Co. or Div., Oakland CA	1G4a			
53	20 [Owens-Illinois Symbol] #; & Olympia label	Owens Illinois Pacific Coast Co. or Div., Oakland CA; & Olympia Brewing Co., Tumwater, WA	1G4a			
54	Black Label Beer (label)	Carling Brewing Co., Baltimore, MD	1G4a			
55	NW[connected]	Northwestern Glass Co., Seattle, WA.	1G4a			

Appendix F. Manufacturers, brand names, and makers marks from Codlfoot, Tofty, and Wiseman artifacts.

ID	Maker's Mark or Brand Name	Maker, Distributor, or Parts Manfr.	Function	CF1	CF3	CF4
56	6 [Owens-Illinois Symbol] #	Owens-Illinois Glass Co., Charleston W. Va.	1G4a			
57	7 [Owens-Illinois Symbol] #	Owens-Illinois, Alton IL	1G4a			
58	A [underlined]	??	1G4a			
59	Ball 4	Ball Bro's Co., Muncie IN	1G4a			
60	DUBUQUE MALTING CO.	Dubuque Malting Co., Dubuque IA	1G4b			
61	G.H. Moore Old Bourbon & Rye	Jesse Moore-Hunt Co., San Francisco CA	1G4c			
62	Schenley Brandy	??	1G4c			
63	Canadian Mist	Canadian Mist Distillers Ltd., Collingwood, Ont., Canada	1G4c			
64	# [oval & diamond & I] #	Owen's Illinois Pacific Coast Co. or Div., various CA	1G4c			
65	Seagram's	Seagram Ltd., Waterloo, Ontario Canada	1G4d			
66	[none]	[?], "Choslovakia" [Czechosovakia]	1G4d			
67	No.2	H.S. Crockett Co., [?]	1H1a			
68	TheTelephone	Richter, Germany	1H2a			
69	(Monopoly?)	Parker Bros., Salem MA	(1H3?)			
70	Latticinio Core	[?], Germany	1H3a	2		
71	Bennington	[?], Germany	1H3a			
72	Cats-Eye or "Banana"(?)	(Peltier Glass Co., Ohio?)	1H3a			
73	Willson Made in USA	[?], U.S.A.	(1H5?)			
74	Indian	??	1H5a			
75	[coinage]	United States of America Government	1N1	1		
76	[coinage]	Canadian (British) Government	1N1			
77	A.B.	C.A. Klinkher & Co., San Francisco CA	1N2	2		
78	[clock face]	Waterbury Lock Co., [?]	2A6b			
79	[H with A]	Hazel-Atlas Glass Co., Wheeling, W.VA	2B1d			
80	BREAKFAST COCOA & figure of a lady holding a tray	Walter Baker Co., [?]	2B1d1	1		
81	[H with A within it]	Hazel-Atlas Glass Co., Wheeling, W.VA	2B1d1			
82	Kool-Aid	General Foods Corp., [?], U.S.A.	2B1d1			
83	Coca-Cola	Coca-Cola Corp., [?]; Owens Illinois, [?]	2B1d1a			
84	Curtice Bros.	Curtice Bros. Preservers, Rochester NY	2B1d2b		1	
85	Snider's Catsup	T.A. Snider, (poss. Cinncinnati OH) Chicago IL (to 1923)	2B1d2b			

Appendix F. Manufacturers, brand names, and makers marks from Codlfoot, Tofty, and Wiseman artifacts.

ID	Maker's Mark or Brand Name	Maker, Distributor, or Parts Manfr.	Function	CF1	CF3	CF4
		(or poss. Albion NY 1923-43)				
86	Lea & Perrins	Lea & Perrins, Worcester, England	2B1d2c	2		
87	D. Ghirardelli's Cocoa	D. Ghirardelli Co., San Francisco CA	2B1d3	1		
88	Colman's British Corn Flour	Colman, Norwich, England	2B1d3		1	
89	Presto	Boyd's, [?]	2B1d3			
90	California Home Brand	[?], CA	2B1d3			
91	Hormel; [H with A within it]	Geo. A. Hormel & Co., Austin, Minn.; & Hazel-Atlas Glass Co., Wheeling, W.VA	2B1d3			
92	Ball Perfect Mason Jar	Ball Bros. Co., Muncie IN	2B1d3a			
93	Hills Bros (Java & Mocha, & Red Can brand)	Hills Bros, San Francisco CA	2B1d3b	21	6	
94	M.J.B.	...[Ber?]nstein & Co., San Francisco, CA	2B1d3b			
95	Gold Shield	Schwabacher's Bros. & Co. Inc., Seattle WA	2B1d3b			
96	Lipton	Lipton Co., [?]	2B1d3c			
97	Royal	Royal Baking Powder Co., [?]; or Standard Brands Inc., [?] >=1929	2B1d3d	2	1	
98	The Most Perfect Made Dr. Price Cream	??	2B1d3d		1	
99	Calumet	??	2B1d3d			
100	Creme de Luxe Olive Oil	S.P. & M. (?), Pari, Italy	2B1d3e	1		
101	California Fruits	[?], California	2B1d3f			
102	LaMont's Crystallized Egg	C. Fred LaMont, St. Louis MO	2B1d3g			
103	National	National Bakers' Egg Co., St. Louis, MO.	2B1d3g			
104	Bradner's Jersey Creamery Butter	The Bradner Company, Seattle WA	2B1d3h	15	1	
105	Fancy Creamery Butter	Hills Bros., San Francisco, CA	2B1d3h			1
106	Golden State Pasteurized Butter	California Central Creameries, San Francisco, CA	2B1d3h			
107	Coldbrook Creamery	C.E. Whitney & Co., San Francisco, CA	2B1d3h			
108	Colman's No.1 Starch	Colman, Norwich, England	2B1d3i			
109	Borden's Eagle Brand	Borden's Condensed Milk Co., [?], NY	2B1d3j	3	6	1
110	CAR(...) Pure Lard	??	2B1d3k			
111	Shield Pure Lard	Armour & (Co.?), [?]	2B1d3k			

Appendix F. Manufacturers, brand names, and makers marks from Codifoot, Tofty, and Wiseman artifacts.

ID	Maker's Mark or Brand Name	Maker, Distributor, or Parts Manfr.	Function	CF1	CF3	CF4
112	Rex	??	2B1d3k			
113	??	[?], Norway	2B1d3l		3	
114	??	C. Lave(...?), France	2B1d3l		3	
115	??	[?], Uruguay	2B1d3l		1	
116	Eagle Brand	Borden's Condensed Milk Co., [?], NY	2B1d3n		4	
117	Karo	??	2B1d3o			1
118	["T" overlapping "S"]	[?], Germany	2B1e5			
119	[...]ear Steel	[...]ear Steel, Shefield, England	2B1f1			
120	American Can U.S.A.	American Can Co., San Francisco CA	2B1g2			
121	Schlitz	Joseph Slitz Brewing Co., Milwaukee WI	2B1g5			
122	[stylized "A" with eagle]	Anheuser Busch Brewing Association, St. Louis MO	2B1h1			
123	[2 hands clasping]	Frankfort, Louisville, Kentucky	2B1h2			
124	Royal Ironstone Chi(na) \ Johnso(n Bros) Eng(land)	Johnson Bros. Ltd., Staffordshire, England	2B2a			
125	VITREOUS [in a basket] \ Edwin M. Knowles \ China Co.	Edwin M. Knowles China Co, Chester or Newell W. VA	2B2a2			
126	ROGERS NICKEL SILVER	William Rogers Mfg. Co., Hartford Conn.	2B2a5c			
127	J.B. & SONS. HOTEL SILVER	John Baker & Sons, Monmouth Works, Sheffield, England	2B2a5c			
128	EVEREADY	Union Carbide & Carbon Corp., [?], U.S.A.	2B3a			
129	Quick-Lite	Coleman, [?], U.S.A.	2B3c			
130	Banner	Plume & Atwood Mfg. Co., Waterbury Conn.	2B3c1			
131	Pearl	Standard Oil Co., [?], U.S.A.	2B5b			
132	Three in One Oil	Three in One Oil Co., New York NY	2C2	1		
133	Colebrookdale Iron Co	Colebrookdale Iron Co., Pottstown PA	2C3			
134	Sargent & Co	Sargent & Co., [?]	3B2f3			
135	American	American (?), Erie, PA.	3F1	1		
136	CHI	[?], (Chicago IL?)	3F1			
137	U	Remington - UMC, Bridgeport CONN	5B2b/5B2c	37	1	1
138	H	Winchester, New Haven CONN	5B2b/5B2c	32	1	3
139	W.R.A. Co. or W.R.A. CO.	Winchester, New Haven CONN	5B2b/5B2c	14	5	
140	U.M.C.	United Metallic Cartridge Co., [?]	5B2b/5B2c	6		

Appendix F. Manufacturers, brand names, and makers marks from Codlfoot, Tofty, and Wiseman artifacts.

ID	Maker's Mark or Brand Name	Maker, Distributor, or Parts Manfr.	Function	CF1	CF3	CF4
141	REM - UMC	Remington - UMC, Bridgeport CONN	5B2b/5B2c	1		
142	P	Peters Cartridge Co, Cinncinnati OH	5B2b/5B2c	1		
143	SAVAGE	Savage, [?], Conn.	5B2b/5B2c			
144	EP	Montgomery Ward, Chicago IL	5B2b/5B2c			
145	SUPER X	Winchester, New Haven CONN	5B2b/5B2c			
146	W [No. 5 primer]	Winchester, New Haven CONN	5B2e	2		
147	W.R.A. Co. \ NEW No 4	Winchester, New Haven CONN	5B2e			
148	WINCHESTER \ No 28	Winchester, New Haven CONN	5B2f			
149	1901 \ No 12 \ LEADER	Winchester, New Haven CONN	5B2f			
150	REM - UMC \ No. 16 \ ARROW	Remington - UMC, Bridgeport CONN	5B2f			
151	REMINGTON \ UMC \ No \ 28 \ NITRO CLUB	Remington - UMC, Bridgeport CONN	5B2f			
152	WINCHESTER \ No.28 \ REPEATER	Winchester, New Haven CONN	5B2f			
153	WINCHESTER \ No. 12 \ LEADER	Winchester, New Haven CONN	5B2f			
154	ONEIDA V	Victor Trap Co., Oneida NY	5E			
155	("Manufactured by..")	Z.C. Miles & Piper Co., Seattle WA	5J1		1	
156	K	Kinghorn Btl Co, Kinghorn, Fifeshire, Scotland	8A1		1	
157	KCB	Kilner Brothers Ltd., Conisbrough, Yorkshire, England	8A1			
158	B	Buck Glass Co. Baltimore MD	8A1			
159	[...] W. [in script]	various Wightman glass co.s, Parker PA	8A2	1		
160	BISHOP & COMPANY; image of man blowing a trumpet on a horse	Bishop & Co., Los Angeles CA	8C2b		1	
TOTALS:				182	73	11

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	CF5 L4	CF5 fill	CF6	CF7	CF10	CF11	CF14	CF16	CF17	CF25	T1 non-L3	T1 L3	W1
1	L.S. & CO.	3		1								3		1
2	Boss of the Road													2
3	Shirley President							2						
4	L.S. CO.	1		1								11		1
5	Washburne (?)							1						
6	Dr Scholl's Foot-easer													2
7	[none]							1						
8	Hirsc...kahn\ Optic ... ..io Su..													
9	Pepsodent													
10	Ribbon Dental Cream							1						
11	Yankee Shaving Soap													
12	Colgate's Violet Talc Powder							1						
13	Cashmere Bouquet							1						
14	Dabrooks Perfumes							1						
15	White Vaseline							1						
16	Eno's				1									
17	(..)B & H N.Y.					1								
18	Mentholatum													1
19	Nuxated Iron													
20	Vaseline Petroleum Jelly													1
21	Fresh Tuxedo Tobacco													
22	Velvet Tobacco					10								
23	Prince Albert Crimp Cut			1										
24	Lucky Strike			1										
25	Patternson's Tuxedo			1				8						
26	Old English Curve Cut [pipe]													
27	[none]					1								
28	Egyptian Arab					1								
29	W D C (in an inverted triangle)\ WELLINGTON													

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	CF5 L4	CF5 fill	CF6	CF7	CF10	CF11	CF14	CF16	CF17	CF25	T1 non-L3	T1 L3	W1
30	Copenhagen													1
31	Edgeworth Extra High Grade Cut Plug				1			1						
32	Lucky Strike Cut Plug			3		1								
33	J.G. Dill's Best Cut Plug			1		1								
34	J.G. Dill's Best Cube Cut Plug											1		
35	Westover Trademark	6			1			3						
36	Arrowhead													
37	Battle Ax	1												
38	A B Co			5			1				3		1	
39	I.P.G. CO.													
40	AB [monogram]; Anheuser			2						2	3			
41	A.B.G.M.Co.						1				2			
42	ROOT					1					2			
43	S. G. CO.													
44	W F & S MILW, (prob. Pabst Blue Ribbon)						4				2			
45	R & Co.			1						1	2			
46	I. G. CO.										1			
47	M.B. & G. Co.										1			
48	S B & G Co										1			
49	I										1			
50	A										1			
51	L			2							1			
52	20 [Owens-Illinois Symbol] #											1		2
53	20 [Owens-Illinois Symbol] #; & Olympia label													2
54	Black Label Beer (label)													1
55	NW[connected]													1

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	CF5 L4	CF5 fill	CF6	CF7	CF10	CF11	CF14	CF16	CF17	CF25	T1 non-L3	T1 L3	W1
56	6 [Owens-Illinois Symbol] #													
57	7 [Owens-Illinois Symbol] #													
58	A [underlined]													
59	Ball 4													
60	DUBUQUE MALTING CO.										1			
61	G.H. Moore Old Bourbon & Rye						1							
62	Schenley Brandy													1
63	Canadian Mist													
64	# [oval & diamond & I] #													
65	Seagram's											1		
66	[none]													1
67	No.2	1												
68	TheTelephone			1										
69	(Monopoly?)							1						
70	Latticinio Core													
71	Bennington				2			1						
72	Cats-Eye or "Banana"(?)							1						
73	Willson Made in USA													1
74	Indian							1						
75	[coinage]	1												
76	[coinage]	2												
77	A.B.													
78	[clock face]			1										
79	[H with A]											1		
80	BREAKFAST COCOA & figure of a lady holding a tray													
81	[H with A within it]											2		
82	Kool-Aid													1
83	Coca-Cola											1		
84	Curtice Bros.													
85	Snider's Catsup					3								

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	CF5 L4	CF5 fill	CF6	CF7	CF10	CF11	CF14	CF16	CF17	CF25	T1 non-L3	T1 L3	W1
86	Lea & Perrins													
87	D. Ghirardelli's Cocoa													
88	Colman's British Corn Flour													
89	Presto													1
90	California Home Brand													1
91	Hormel; [H with A within it]													1
92	Ball Perfect Mason Jar													1
93	Hills Bros (Java & Mocha, & Red Can brand)			1		2	2	2						3
94	M.J.B.		1				1							
95	Gold Shield							1						
96	Lipton							1						
97	Royal		1	2					1	1				2
98	The Most Perfect Made Dr. Price Cream													
99	Calumet													1
100	Creme de Luxe Olive Oil													
101	California Fruits					10	1							
102	LaMont's Crystallized Egg			2		3								
103	National			1		3			1					
104	Bradner's Jersey Creamery Butter							2						
105	Fancy Creamery Butter			7		9								
106	Golden State Pasteurized Butter		1	3		2		1	1					
107	Coldbrook Creamery								2					
108	Colman's No.1 Starch			3		2		1						
109	Borden's Eagle Brand			15		31			1					
110	CAR(...) Pure Lard		1											
111	Shield Pure Lard			3										

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	CF5 L4	CF5 fill	CF6	CF7	CF10	CF11	CF14	CF16	CF17	CF25	T1 non-L3	T1 L3	W1
112	Rex				1									
113	??													
114	??													
115	??													
116	Eagle Brand			20		122								
117	Karo													
118	["T" overlapping "S"]													1
119	[...]ear Steel				1									
120	American Can U.S.A.													1
121	Schlitz													1
122	[stylized "A" with eagle]											1		
123	[2 hands clasping]													1
124	Royal Ironstone Chi(na) \ Johnso(n Bros) Eng(land)					1								
125	VITREOUS [in a basket] \ Edwin M. Knowles \ China Co.											1		
126	ROGERS NICKEL SILVER													1
127	J.B. & SONS. HOTEL SILVER													1
128	EVEREADY		1											1
129	Quick-Lite											1		
130	Banner											1		
131	Pearl					1								
132	Three in One Oil													
133	Colebrookdale Iron Co											1		
134	Sargent & Co					1								
135	American													
136	CHI													1
137	U	5	1	1	3	1		52				1		2
138	H	25		7	4			5				2		1
139	W.R.A. Co. or W.R.A. CO.	4			2			2						
140	U.M.C.	12												

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	CF5 L4	CF5 fill	CF6	CF7	CF10	CF11	CF14	CF16	CF17	CF25	T1 non-L3	T1 L3	W1
141	REM - UMC							1						
142	P	1												2
143	SAVAGE							1						
144	EP													1
145	SUPER X											1		
146	W [No. 5 primer]	2												
147	W.R.A. Co. \ NEW No 4	1			1									
148	WINCHESTER \ No 28	1						3						
149	1901 \ No 12 \ LEADER	1												
150	REM - UMC \ No. 16 \ ARROW	1												
151	REMINGTON \ UMC \ No \ 28 \ NITRO CLUB	1						1						
152	WINCHESTER \ No.28 \ REPEATER		1											
153	WINCHESTER \ No. 12 \ LEADER							2						
154	ONEIDA V													1
155	("Manufactured by..")													
156	K													
157	KCB			1										
158	B			1										
159	[...] W. [in script]													
160	BISHOP & COMPANY; image of man blowing a trumpet on a horse													
TOTALS:		69	7	88	17	207	11	100	6	4	21	30	1	44

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	W1 trash	TOTALS
1	L.S. & CO.		16
2	Boss of the Road		2
3	Shirley President		2
4	L.S. CO.		19
5	Washburne (?)		1
6	Dr Scholl's Foot-easer		2
7	[none]		1
8	Hirsc...kahn\ Optic ... ..io Su..		1
9	Pepsodent		2
10	Ribbon Dental Cream		1
11	Yankee Shaving Soap		1
12	Colgate's Violet Talc Powder		1
13	Cashmere Bouquet		1
14	Dabrooks Perfumes		1
15	White Vaseline		1
16	Eno's		1
17	(..)B & H N.Y.		1
18	Mentholatum		1
19	Nuxated Iron		1
20	Vaseline Petroleum Jelly		1
21	Fresh Tuxedo Tobacco		1
22	Velvet Tobacco		19
23	Prince Albert Crimp Cut		5
24	Lucky Strike		4
25	Pattemson's Tuxedo		11
26	Old English Curve Cut [pipe]		1
27	[none]		1
28	Egyptian Arab		1
29	W D C (in an inverted triangle)\ WELLINGTON		1

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	W1 trash	TOTALS
30	Copenhagen		3
31	Edgeworth Extra High Grade Cut Plug		9
32	Lucky Strike Cut Plug		8
33	J.G. Dill's Best Cut Plug		4
34	J.G. Dill's Best Cube Cut Plug		1
35	Westover Trademark		15
36	Arrowhead		2
37	Battle Ax		1
38	A B Co	1	14
39	I.P.G. CO.		1
40	AB [monogram]; Anheuser	2	15
41	A.B.G.M.Co.		3
42	ROOT		4
43	S. G. CO.		1
44	W F & S MILW, (prob. Pabst Blue Ribbon)	2	9
45	R & Co.		4
46	I. G. CO.		1
47	M.B. & G. Co.		1
48	S B & G Co		1
49	I		1
50	A		1
51	L		3
52	20 [Owens-Illinois Symbol] #		3
53	20 [Owens-Illinois Symbol] #; & Olympia label		2
54	Black Label Beer (label)		1
55	NW[connected]	1	2

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	W1 trash	TOTALS
56	6 [Owens-Illinois Symbol] #	2	2
57	7 [Owens-Illinois Symbol] #	1	1
58	A [underlined]	1	1
59	Bail 4	1	1
60	DUBUQUE MALTING CO.		1
61	G.H. Moore Old Bourbon & Rye		1
62	Schenley Brandy		1
63	Canadian Mist	1	1
64	# [oval & diamond & I] #	3	3
65	Seagram's		1
66	[none]		1
67	No.2		1
68	TheTelephone		1
69	(Monopoly?)		1
70	Latticinio Core		2
71	Bennington		3
72	Cats-Eye or "Banana"(?)		1
73	Willson Made in USA		1
74	Indian		1
75	[coinage]		2
76	[coinage]		2
77	A.B.		2
78	[clock face]		1
79	[H with A]		1
80	BREAKFAST COCOA & figure of a lady holding a tray		1
81	[H with A within it]		2
82	Kool-Aid		1
83	Coca-Cola		1
84	Curtice Bros.		1
85	Snider's Catsup		3

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	W1 trash	TOTALS
86	Lea & Perrins		2
87	D. Ghirardelli's Cocoa		1
88	Colman's British Corn Flour		1
89	Presto		1
90	California Home Brand		1
91	Hormel; [H with A within it]		1
92	Ball Perfect Mason Jar		1
93	Hills Bros (Java & Mocha, & Red Can brand)		37
94	M.J.B.		2
95	Gold Shield		1
96	Lipton		1
97	Royal		10
98	The Most Perfect Made		1
	Dr. Price Cream		0
99	Calumet		1
100	Creme de Luxe Olive Oil		1
101	California Fruits		11
102	LaMont's Crystallized Egg		5
103	National		5
104	Bradner's Jersey Creamery Butter		18
105	Fancy Creamery Butter		17
106	Golden State Pasteurized Butter		8
107	Coldbrook Creamery		2
108	Colman's No.1 Starch		6
109	Borden's Eagle Brand		57
110	CAR(...) Pure Lard		1
111	Shield Pure Lard		3

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	W1 trash	TOTALS
112	Rex		1
113	??		3
114	??		3
115	??		1
116	Eagle Brand		146
117	Karo		1
118	["T" overlapping "S"]		1
119	[...]ear Steel		1
120	American Can U.S.A.		1
121	Schlitz		1
122	[stylized "A" with eagle]		1
123	[2 hands clasping]		1
124	Royal Ironstone Chi(na) \ Johnso(n Bros) Eng(land)		1
125	VITREOUS [in a basket] \ Edwin M. Knowles \ China Co.		1
126	ROGERS NICKEL SILVER		1
127	J.B. & SONS. HOTEL SILVER		1
128	EVEREADY		2
129	Quick-Lite		1
130	Banner		1
131	Pearl		1
132	Three in One Oil		1
133	Colebrookdale Iron Co		1
134	Sargent & Co		1
135	American		1
136	CHI		1
137	U		105
138	H		80
139	W.R.A. Co. or W.R.A. CO.		27
140	U.M.C.		18

Appendix F. Manufacturers, brand name

ID	Maker's Mark or Brand Name	W1 trash	TOTALS
141	REM - UMC		2
142	P		4
143	SAVAGE		1
144	EP		1
145	SUPER X		1
146	W [No. 5 primer]		4
147	W.R.A. Co. \ NEW No 4		2
148	WINCHESTER \ No 28		4
149	1901 \ No 12 \ LEADER		1
150	REM - UMC \ No. 16 \ ARROW		1
151	REMINGTON \ UMC \ No \ 28 \ NITRO CLUB		2
152	WINCHESTER \ No.28 \ REPEATER		1
153	WINCHESTER \ No. 12 \ LEADER		2
154	ONEIDA V		1
155	("Manufactured by..")		1
156	K		1
157	KCB		1
158	B		1
159	[...] W. [in script]		1
160	BISHOP & COMPANY; image of man blowing a trumpet on a horse		1
TOTALS:		15	886

IMAGE EVALUATION TEST TARGET (QA-3)

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APPLIED IMAGE, Inc
1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989