CHAPTER 12: ARMS AND MUNITIONS
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Introduction

The Castle Hill excavations produced approximately 300 weaponry-related artifacts associated with hunting and defense of the Russian settlement. These munitions, gun parts, and firearm accoutrements constitute a sizable collection, although constituting a small part of the overall collection. They are categorized as gunflints (n = 135); lead shot (n = 52); lead sprue (n = 19); iron shot, including cannonballs, grape shot and/or canister shot (n = 49); gun parts (n = 23); a single powder can lid; and a single saber blade fragment. Additionally, the collection includes a variety of spent cartridge casings (n = 38) from disturbed deposits which post-date Russian occupation of the site. Some of these probably relate to the early U.S. occupation of Sitka following the transfer.

Weaponry was an important component of New Arkhangel's material culture, particularly in light of the tenuous relationship between the Russians and Tlingit. S.I. Yanovskii, acting Chief Manager at Sitka during 1818-1820, published an order:

> Every commander should inspect his guns as often as possible; they should be clean; the powder should be dry and flints and all supplies should be in readiness; it should be impressed upon those who are assigned to the various posts that they should have their guns in good working order and know their posts...
>
> The fort is strongly guarded. Everyone depends on our guards. Inspectors and guards alike should be on the alert all the time [Khlebnikov 1994:184-185].

When Litke visited Sitka in 1826, he noted "one of the towers along the fortress walls houses the arsenal, with enough firearms and hand arms for over a thousand men, kept in good order (Litke 1987:58)." For the same year, Khlebnikov calculated the capital worth of the arsenal at 140,600 rubles, excluding artillery on ships and at outposts. He itemized the main articles of the arsenal as follows: "49 cast iron cannons and carronades; 15 falconets; 28 copper [brass?] cannons of various calibers; 43 various muskets; 1,368 various military rifles; 34 hunting rifles; 53 carbines; 291 pistols; 205 rifles; 95 carbines, sabers, cutlass, shot, canisters and various artillery shells; and powder" (Khlebnikov 1994:174). Khlebnikov also described several rare weapons from the main office:

> ... two Persian carbines, one of which is worth 450 rubles; one saber inlaid with precious stones worth 560 rubles; two Persian *yatagans* made of silver, 210 rubles; one Dalmatian saber, 112 rubles; one set of Persian pistols made of silver, 300 rubles, and one rifle with gold inlay, 150 rubles [Khlebnikov 1994:175].

Khlebnikov wrote that most of the soldiers' weapons were of French or English manufacture and of high quality (ibid). Powder and ammunition for the guns as well as signal flares for the ships were manufactured in Sitka. Information on sources or manufacturers of the common small arms is rare. The earliest Russian expeditions to Alaska were generally supplied with smoothbore flintlock muskets manufactured in Tula, near Moscow, or Tobol'sk (Townsend 1983; Crowell 1997:187-188). By 1826 the small arms arsenal at Sitka included a much broader array of weapons.

Some information is available on the types and sources of Russian artillery pieces that remained in Sitka during the mid-20th century. A document prepared by Donald Clark (n.d.), apparently for Sitka National Historical Park around 1965, indicates that 18 cannons were on display in Sitka and others were in private collections. Clark cited documentation that 150 cannons were transferred to the U.S. at the time of the Alaska Purchase in 1867. While the fate of these is largely unknown, some were eventually used as dead-man pilings or placed in private collections (George Hall, personal communication) and others may have been used as anchors in the channel at Sitka (Clark n.d.). A number of Russian cannons and carronades remain in Sitka, and are displayed around Castle Hill and other public areas (Figure 12.1). These are believed to be naval guns removed from ships for coastal defense.

Figure 12.1. Russian cannon on top of Castle Hill prior to 1998 renovation.

The Castle Hill Assemblage

Iron shot:

Iron shot in the Castle Hill assemblage includes spherical solid shot used in cannons and carronades, as well as smaller grape shot and canister shot. No hollow explosive projectiles were recovered, although Clark (n.d.) reported examples at Sheldon Jackson Museum. The majority of the Castle Hill specimens are attributed to grape or canister shot, and a lesser number to lightweight swivel guns. Measurements of the Castle Hill specimens are regarded approximate due to corrosion and the presence of rust encrustation on some specimens at the time of measurement.

Only three larger cannonballs were recovered (Table 12.1; Figure 12.2). The largest (98-8207), weighing 13.3 lbs. (diameter = 4.8 in.), might have been intended for use in a naval gun of the twelve-to-eighteen pounder class. It was recovered from the base of a large postmold near the top of the hill where it was apparently used as a post prop. Pottery sherds from this feature

Table 12.1. Dimensions and weights for Castle Hill iron shot.

Accession	Cat. No.	Unit	Diam. (mm)	Wt. (gr.)
UA97.094	45411	N97 / E130	27	78
UA97.094	45675	N98 /E132	16	15
UA97.094	06337	N104.56 / E131.89	50	460
UA97.094	06380	N103 / E133	41	236
UA97.094	45668	N103 / E133	30	79
UA97.094	00010	N84.07 / E121.7	23	47
UA97.094	09805	N100 / E131	24	50
UA97.094	33757	N98 / E130	25	63
UA97.094	24838	N101 / E128	24	48
UA97.094	45368	N101 / E131	24	43
UA97.094	06373	N100.5 / E134.13	43	292
UA98.052	01360	N109 / E136	15	16
UA98.052	08054	N97 / E134	23	31
UA98.052	08630	Upper Trail	111	4532
UA98.052	10182	N97 / E136	23	34
UA98.052	02969	N96 / E133	23	32
UA98.052	00018	N102 / E140	23	39
UA98.052	07040	N94 / E136	24	42
UA98.052	01304	N97 / E139	23	46
UA98.052	06860	N98 / E137	23	
UA98.052	01354	N106 / E140	23	46
UA98.052	05831	N101 / E141	16	10
UA98.052	05053	N96 / E136	32	122
UA98.052	00973	N103 / E141	23	43
UA98.052	03496	N96 / E137	31	89
UA98.052	08207	Feature 98-UT-3	122	6032
UA98.052	02205	N108 / E135	91	1571
UA98.052	08839	N115.02 / E136.08	49	430
UA98.052	07976	N97.3 / E135.87	49	444
UA98.052	08605	N100 / E141	31	
UA98.052	08619	Upper trail	45	
UA98.052	07892	N97 / E135	41	236
UA98.052	00865	N102 / E140.9	38	200
UA98.052	04066	N93 / E136	37	191
UA98.052	05443	N96 / E135	35	148
UA98.052	00742	N98.05 / E137.42	24	46
UA98.052	09604	N98 / E139	31	110
UA98.052	03351	N98 / E135	23	44
UA98.052	07059	N94 / E136	34	138
UA98.052	05980	N102 / E141	33	124
UA98.052	04046	N93 / E136	33	125
UA98.052	07060	N94 / E136	36	138
UA98.052	04040	N93 / E138	35	133
UA98.052	07711	N106 / E138	29	84
UA98.052	00017	N96 / E131 (Balk)	29	75
UA98.052	05057	N96.56 / E136.37	26	68
UA98.052	07069	N94 / E136	26	70
UA98.052	03277	N98 / E135	32	117
UA98.052	08232	N98 / E136	36	163

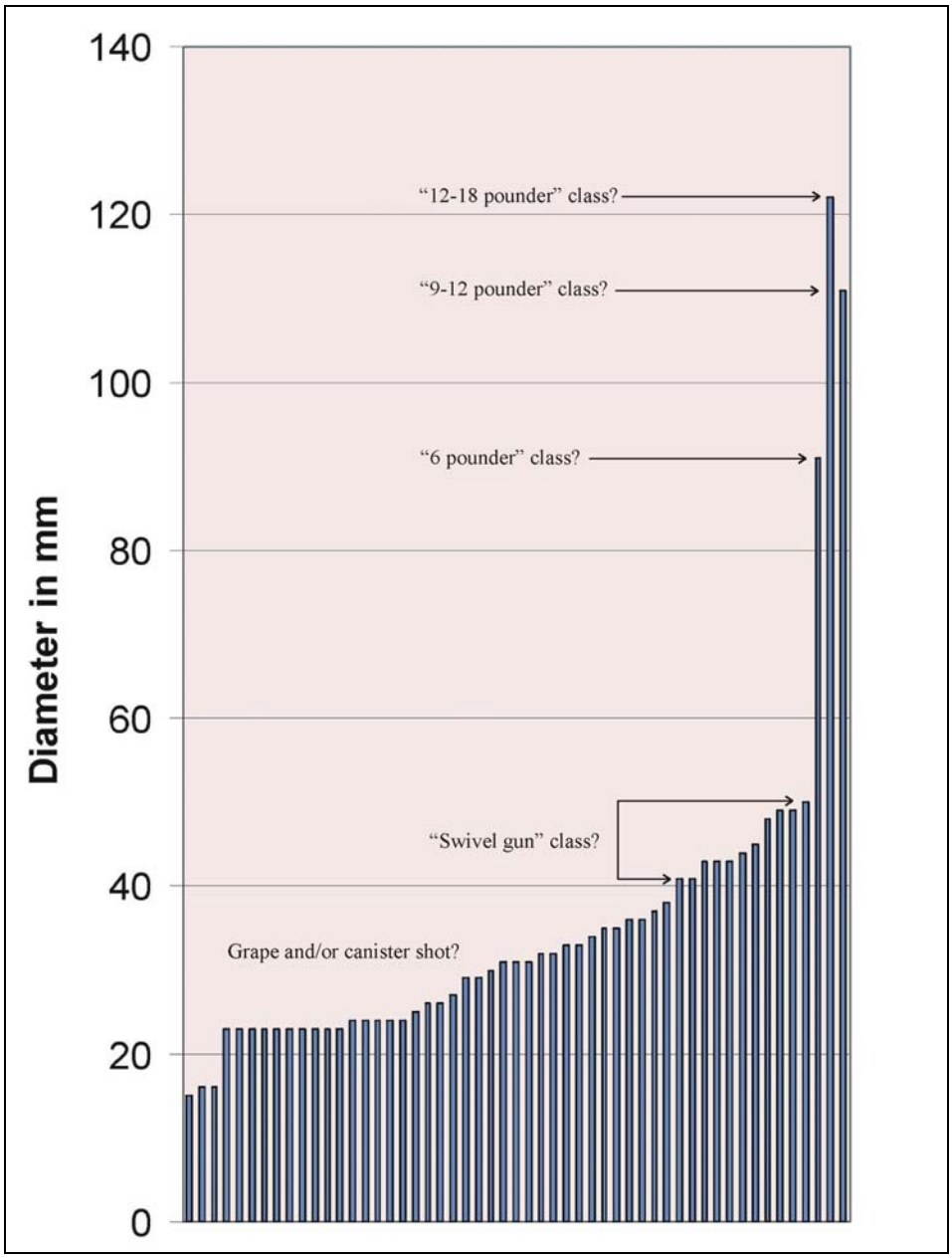

Figure 12.2. Distribution of Castle Hill iron shot by diameter.

(Feature 98-UT-3) produced a mean ceramic date of 1825 and a *terminus post quem* ceramic date of 1838. Another large projectile (98-8630), weighing 10 lbs. (diameter = 4.4 in.), might have been intended for use in a naval gun of the nine-to-twelve pounder class. It was recovered from the surface during construction monitoring on the slopes of the hill. The third largest specimen (98-2205) consists of half of a solid shot that was broken hemispherically. The specimen served as a prop in the base of a postmold associated with Building 3, a probable workshop (mean ceramic date = 1822). The fragment weighs 3.46 lbs. The complete weight, by extension, was approximately 6.9 lbs. (diameter = 3.6 in.). It probably was intended for use in a six-pounder class naval gun.

The remaining projectiles in the collection (n = 46) range from 0.59-1.97 in. (15-50 mm) in diameter. The largest of these (n = 7; 1.57-1.97 in.) probably were intended for use in swivel guns. The others are probably grape and/or canister shot. Measurements of the Castle Hill specimens were compared against British standards for naval ordnance, which may vary from Russian standards. This may account for our inability to precisely match the Castle Hill specimens against bore diameters for British ordnance. Because many grape and canister shot are contained within a single charge, size variation between the shot is inconsequential.

Lead Shot:

The Castle Hill lead shot (n = 52), with the exception of two modern conical specimens from disturbed levels, is comprised of roundballs ranging in size from .068 - 0.956 in. (1.7 – 24 mm). The smallest is a single bird shot, eight are within the general size limits of buckshot, 23 are within the .36 to .58 caliber range, 12 are within the .60 caliber range, and 7 are in the .77 to .80 caliber range. Figure 12.3 attempts to estimate projectile/bore caliber from corresponding weights. Weight-caliber correlations were obtained from the 2002 Dixie Gunworks catalog and from Donald Spires (personal communication), an archaeologist with an extensive collection and knowledge of black-powder firearms. While tabulation by weight overcomes diameter distortion due to projectile deformation, it should be regarded approximate due to differences in lead alloy and corrosion. Considerable variability may be found in the ball diameters used in a weapon of a particular bore size, depending on windage (i.e., the difference between the bore and ball diameters). Due to the buildup of powder deposits on the walls of the bore, balls considerably smaller than the bore were shot (Hamilton 1987:125). The thickness of the patch material placed around a ball also determines usable size. For example, some of the rifled revolvers didn't use patches at all (Donald Spires, personal communication). The term "caliber" in Figure 12.3 follows modern usage (e.g., .32 caliber = a bore with a diameter of .32 in.). There is no correlation between modern usage of the term caliber and the 18th century French *calibre* (Hamilton 1987:125).

The majority of the Castle Hill specimens are of large caliber, which would be expected of the smoothbore military muskets in use during the late 18th and early 19th centuries. For example, the British colonial "Brown Bess" musket had a bore diameter of approximately .75 caliber. These type muskets, which fired round balls approaching the diameter of quarters, were very slow to load, highly inaccurate, and prone to frequent misfires (Canadian War Museum). Almost a century later, Sydney Skertchly (1879:4) conducted an experiment by firing a flintlock pistol 100 times, beginning with a new flint. He found that the pistol fired 36 times, flashed without setting off the charge 25 times, and missed fire 39 times. The early Russian firearms were also viewed as inaccurate and unreliable. As late as the 1840s, Zagoskin (1967:132) wrote "the natives themselves recognize that they have nothing to fear from our weapons, as they can seize them." Despite these misgivings, flintlock technology existed for almost 300 years without change. BLM archaeologist Charles Adkins (personal communication), experienced in the use of flintlocks, attributes the perceived unreliability to problems of teaching soldiers with no mechanical background to operate complex machinery under stress.

The largest number of Castle Hill roundballs (n = 12) fall within the general size range of .69 caliber, a popular musket size throughout the late eighteenth and nineteenth centuries. The standard arm of American military troops during the late 18th and early 19th centuries was the .69 caliber Springfield musket. Many Civil War era weapons also used .69 caliber roundballs. The French Tulle hunting gun, a popular trade musket throughout the 18th and early 19th centuries,

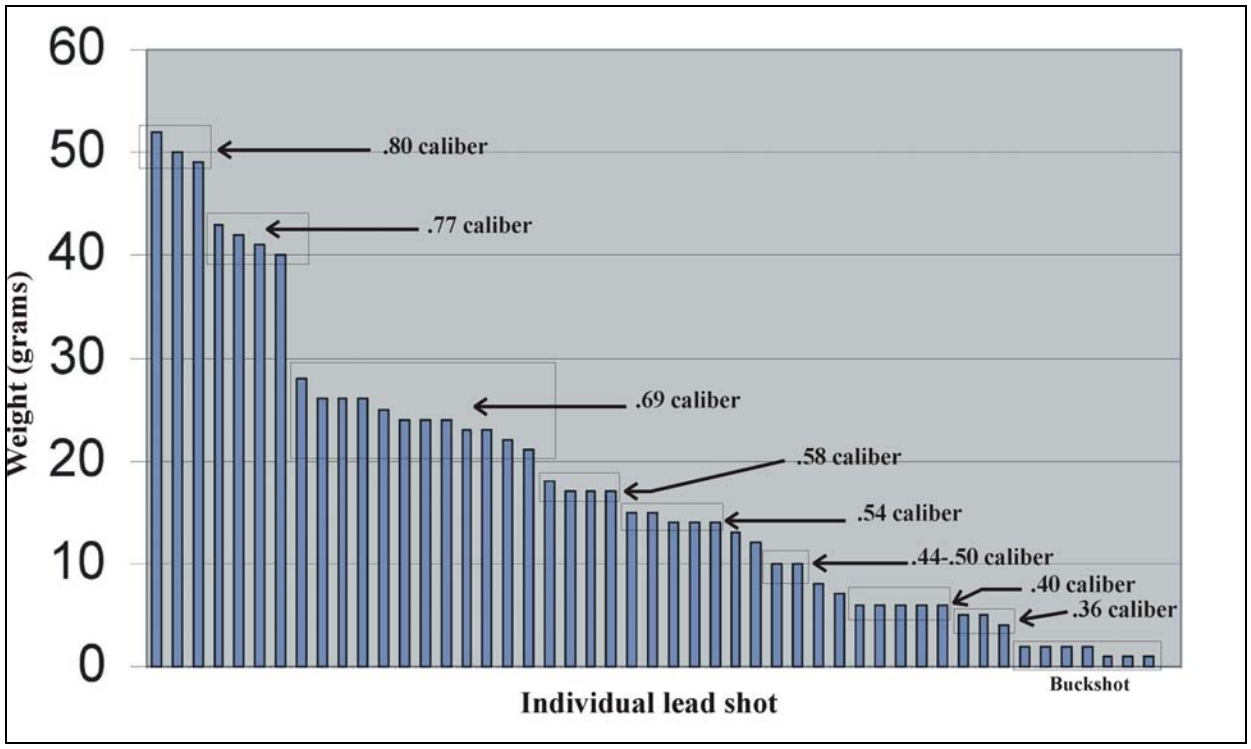

Figure 12.3. Distribution of Castle Hill lead shot by weight and approximate caliber.

was characterized by a .61-.62 in. bore and may account for a few Castle Hill specimens in the .58-.61 caliber range. The broad range of intermediate calibers (i.e., .36,.40, .44-.50, and .58) in the Castle Hill collection might suggest diversification of the arsenal and acquisition from new markets as the large, smoothbore muskets were replaced over time with more efficient weapons. Without detailed stratigraphic analysis, however, this is speculative.

Few of the Castle Hill roundballs, based on deformation, appear to actually have been fired from a weapon. The condition of several specimens suggests they were discarded prior to use due to unsatisfactory mold results. Indicators include balls with misaligned hemispheres, untrimmed sprue, and cavities opposite the sprue. The latter characteristic is produced as a result of "cold molds," prior to the mold being heated by subsequent uses of hot lead. Other specimens are encircled by phalanges due to incomplete mold closure. These observations suggest that bullet making was a daily activity in the workshop area, reinforced by the recovery of sprue (lead trimmed from the pour holes of the molds) from both gang molds (multiple shot) and single-shot molds (Figure 12.4). A database with lead shot measurements is included in Appendix 4.2.

Gunflints:

The Castle Hill assemblage includes 135 whole and fragmentary gunflints, of which 90 were complete enough to record attributes. It is possible that some of the fragmentary specimens excluded from the attribute database were strike-a-lights – used with a "flint-and-steel" for producing sparks. There is no archaeological evidence for the use of percussion firearms in

Figure 12.4. Lead sprue from the Castle Hill workshop area.

Castle Hill's early 19th century workshop deposits, although the technology was available. As early as 1826, Baron von Kittlitz made note of the percussion musket that he used in Sitka:

> The swampy spots in the bushes made hunting especially difficult at the time because we were using rather obsolete muzzle-loaders. To be sure, Dr. Mertens had left me one – since I needed one more here than any place else – but it did not help me much at all, because many of the *detonating caps* were spoiled and the gun itself soon needed repairs – something that could not be done on board ship [in Litke 1987:136, italics added].

The lack of evidence for percussion technology in the deposits might be due to a general lack of preservation of copper caps, but is more likely a product of general firearms usage. Despite the reference by von Kittlitz to "obsolete muzzle-loaders," the percussion technology was still relatively rare in the first quarter of the 19th century. While company employees of higher status may have had access to these newer or re-fitted weapons, standard issue for the troops and laborers more likely consisted of smooth-bore military flintlocks. This is born out by both the large number of gunflints from the workshop deposits and by the preponderance of large caliber balls in the lead shot assemblage. The Sitka arsenal may have been gradually upgraded and/or re-fitted as percussion technology became more widespread on a global basis. In the United States, for example, many of the previously issued military flintlock muskets were re-fitted with percussion locks during the mid-19th century. Illustrations by the Japanese drifter, Jerokichi, depict both flintlock and percussion lock muskets in the Russian arsenal at Okhotsk in 1841 (Plummer 1991:64-65), perhaps indicating a transitional period that extended into Russian America. By 1879, the gunflint trade was greatly reduced in Britain, but was due more from lack of labor than from lack of demand (Skertchly 1879:4). In more remote areas of the world, flintlock usage continued into the 20th century.

Attributes of the Castle Hill gunflints (n = 90) are reported in Appendix 4.2 (database files). Gunflints are comprised of two basic types: those made from flakes struck from prepared blade cores and those made from spalls struck from nodules or cores (Hamilton 1987:138). The former, which are prismatic in appearance, were first made by the French in the late 17th century. Although carefully guarded by the French, the British discovered this manufacturing technology around 1780, probably from a French prisoner (Hamilton 1987:141). British and French gunflints are typically distinguished on the basis of color and length/width attributes, although the separation may not be as simple as once believed (e.g., Hamilton 1987:146; Emery 1987:148-153). French gunflints were typically struck from a glossy translucent yellowish "honey" flint, whereas British gunflints were struck from a non-glossy flint of dark gray to solid black color (Hamilton and Emery 1988:13). French gunflints are generally longer from side-to-side (parallel to prism) than from edge-to-edge, but evolved into an almost square shape by the beginning of the 19th century (ibid). British gunflints are generally shorter side-to-side than from edge-to-edge (ibid). They were retouched or replaced as necessary to consistently spark when contacting the frizzen. Recurring modification during the life of a flint sometimes reversed the original axis. For this reason, Castle Hill gunflints were classified on the basis of material type.

The Castle Hill gunflints for which attributes were recorded (n = 90) may be broken down into British (82%), French (14%), and indeterminate (4%) (Figures 12.5 and 12.6). Almost all are prismatic. There is no good evidence for the use of local materials in the collection. While the Castle Hill assemblage includes a preponderance of finished gunflints, several examples of unmodified British flint nodules were recovered. These are distinguished by the characteristic dark flint covered by a chalky cortex. It is conceivable that these small specimens were fortuitously included in containers of gunflints shipped from England. The manufacture of prismatic gunflints required specialized skill probably not available in Sitka.

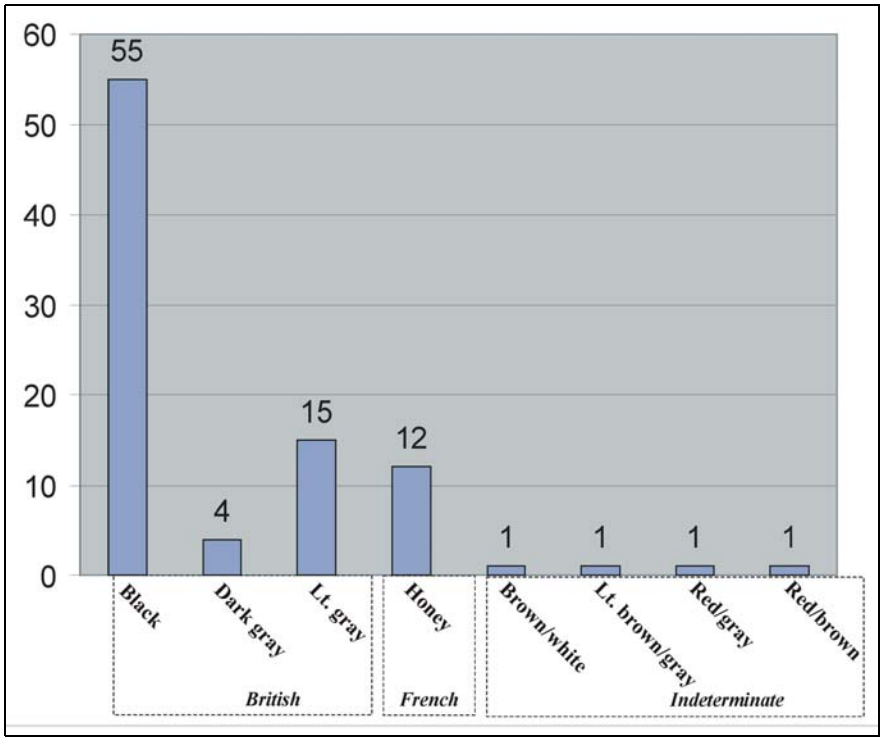

Figure 12.5. Distribution and inferred origin of Castle Hill gunflints based on raw material type.

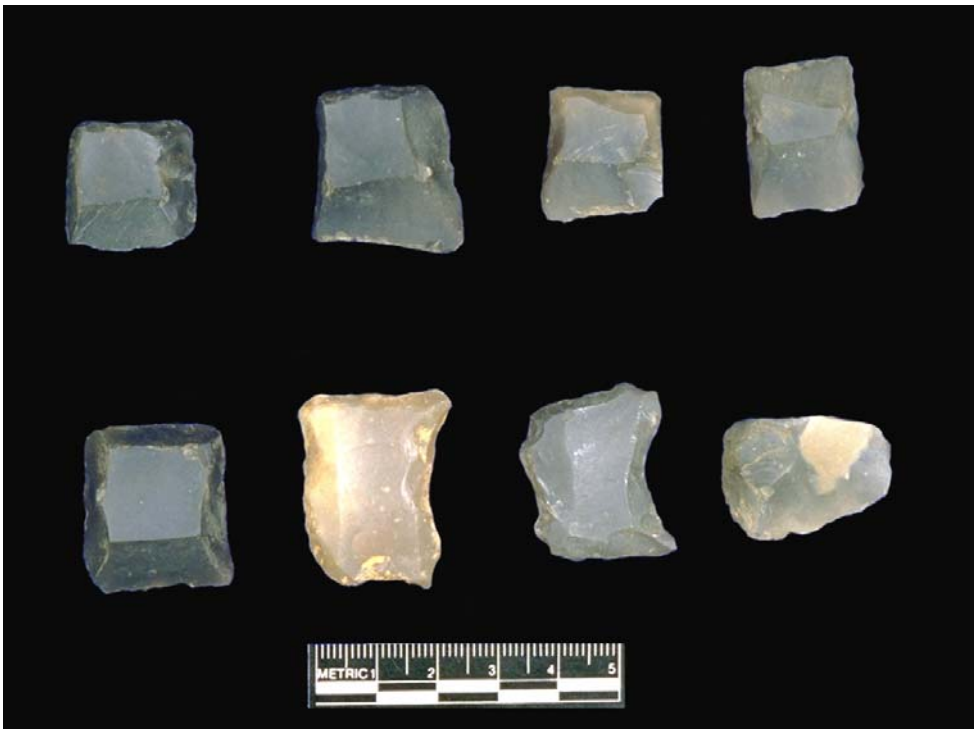

Figure 12.6. Examples of Castle Hill gunflints. Second from the left, bottom, is French honey-colored flint; others are British.

Gun Parts and Accoutrements:

Twenty-four miscellaneous gun parts and accoutrements were recovered from the workshop area (Table 12.2, Appendix 4.2). These include a bullet mold handle (n = 1), cockscrew (n = 1), frizzen (n = 1), powder can cap (n = 1), ramrod ferrules (n = 8), sideplates (n = 3), sling swivel (n = 1), trigger guards (n = 5), and worms (n = 3). All except the bullet mold handle and one of the ramrod ferrules, from the sheet midden, can be associated with the dated buildings.

The excavation of Building 1, with a mean ceramic date of 1827, produced the cockscrew, a sideplate, and four of the ramrod ferrules. All are of copper or copper alloy. This building is believed to have been quarters for the shopworkers (Chapter 6), although evidence suggests that the building was used for work activities as well. Chief Manager F.P. Wrangell, writing to the main office in June 1832 regarding necessary work, states:

> 12. In the gunsmith's [trade]. Examine and repair the company guns requiring repair and keep them clean.
>
> 13. In the house builder's [trade]. Completely finish the new workshops and move out of the old ones, with the condition that the artisans no longer live in the shops, the new ones [Wrangell, in Arndt and Pierce 2001:96].

The sideplate from Building 1 is mostly complete with no discernable markings. The cockscrew, indicative of flintlock maintenance or repair, is the screw that closes the jaws on the flint. Ramrod ferrules are the cylindrical guides that hold the wooden ramrods in place on the under-

Table 12.2. Gun parts and accoutrements from the Castle Hill workshop area.

Accession #	Catalog #	Stratum	Context	Material	Description
UA97.094	17752	II a	midden	Copper	Ramrod Ferrule
UA97.094	10897	I	Surface	Iron	Worm
UA97.094	009	Indet.	Indet.	Iron	Sling Swivel
UA98.052	1296	II b	Bldg. 4	Copper	Ramrod Ferrule
UA98.052	692	I and II	Surface/midden	Copper	Trigger Guard
UA98.052	140	I	Surface	Copper	Sideplate
UA98.052	4985	II b	Bldg. 4	Copper	Trigger Guard
UA98.052	141	I	Surface	Copper	Trigger Guard
UA98.052	1383	II c	Bldg. 3	Copper	Trigger Guard
UA98.052	1984	I	Surface	Lead	Sprue
UA98.052	1297	II b	Bldg. 4	Copper	Ramrod Ferrule
UA98.052	5786	II e	Bldg. 1	Copper	Ramrod Ferrule
UA98.052	2876	I	Surface	Copper	Ramrod Ferrule
UA98.052	9182	II e	Bldg. 1	Copper	Ramrod Ferrule
UA98.052	346	II e	Bldg. 1	Copper	Ramrod Ferrule
UA98.052	9136	II e	Bldg. 1	Copper	Ramrod Ferrule
UA98.052	854	II c	Bldg. 3	Copper	Sideplate
UA98.052	9163	I	Surface	Copper	Trigger Guard
UA98.052	970	I	Surface	Lead	Sprue
UA98.052	9181	II e	Bldg. 1	Copper	Sideplate
UA98.052	4334	II a	midden	Iron	Bulletmold Handle
UA98.052	1362	I	Surface	Iron	Worm
UA98.052	7138	I	Surface	Iron	Worm
UA98.052	2532	I	Surface	Iron	Frizzen
UA98.052	9297	II e	Bldg. 1	Copper	Cockscrew
UA98.052	4984	II b	Bldg. 4	Lead	Powder Can Lid
UA98.052	3367	I	Surface	Lead	Sprue

side of the stock (Lenk 1965:8-9). Some ferrules appear to have been cast, while others were constructed of sheet copper (Figure 12.7). Each firearm had several such guides, which would have required routine maintenance due to constant use of the ramrod for loading and cleaning. These items indicate that gun repair was an activity associated with Building 1. A single saber blade segment with a longitudinal "blood groove" (Figure 12.8) was recovered 15 cm below the Building 1 floor deposit and relates to pre-1827 activities. Buildings stood in this vicinity as early as 1805.

The excavation of Building 3, with a mean ceramic date of 1822, produced a sideplate fragment and the tang (rear) end of a trigger guard. This building is believed to have been a metalworkers' shop (Chapter 6). The gun parts, which are incomplete, might have been removed and discarded during the re-fitting of weapons.

The excavation of Building 4, with a mean ceramic date of 1835, produced two ramrod ferrules, the finial (forward) portion of a trigger guard, and a powder can cap. This building, represented by few structural remains, probably stood until at least the mid-19th century. It may have been the building depicted as a bath house on the 1867 transfer map (DeArmond 1981:72-73, Bldg. 9). The building ruins are difficult to interpret due to extensive disturbance by 20th century gardening and trail construction. It is possible that some artifacts were originally

Figure 12.7. Examples of ramrod ferrules (guides) from the Castle Hill workshop area.

Figure 12.8. Iron saber blade segment from below the floor of Building 1, workshop area.

associated with the earlier workshops, but were disturbed by construction of Building 4 or subsequent activities. The cast lead powder can screw cap bears the markings "CPW" over "SC" (Figure 12.9), and is somewhat similar to one recovered at Kolmakovskiy Redoubt (Oswalt 1980:50-51). The Kolmakovskiy specimen was marked "C.P.W.S.F. CAL," and believed to be an abbreviation for the California Powder Works. The California Powder Works, in Santa Cruz ("SC") was founded in December 1861 to manufacture gunpowder for use in the Civil War (Museum of the City of San Francisco 2002).

The bullet mold handle and a ramrod ferrule were recovered from the sheet midden associated with Buildings 1, 2, and 3. Ceramic dating suggests that the midden (Stratum IIa) dates from 1805-1840. The remaining gun parts in the collection, from either Stratum I or the surface collection, cannot be assigned to a specific context due to disturbance. They include

Figure 12.9. Cast lead powder can cap from California Powder Works, Santa Cruz.

three worms (implements used for extracting shot), a ramrod ferrule, a sling swivel, a frizzen (the part of a flintlock mechanism struck by the flint to produce a spark), a mostly complete trigger guard, the mid-section of a trigger guard, the finial portion of a trigger guard, and a complete sideplate. Examples are depicted in Figure 12.10. The sideplate bears the stamped markings "L_O" (exterior surface) and "__P" (interior surface) (Figure 12.11). It is reminiscent of components of the sturdy but plain French Tulle hunting gun, although in brass rather than iron (Hamilton 1987:31, 47).

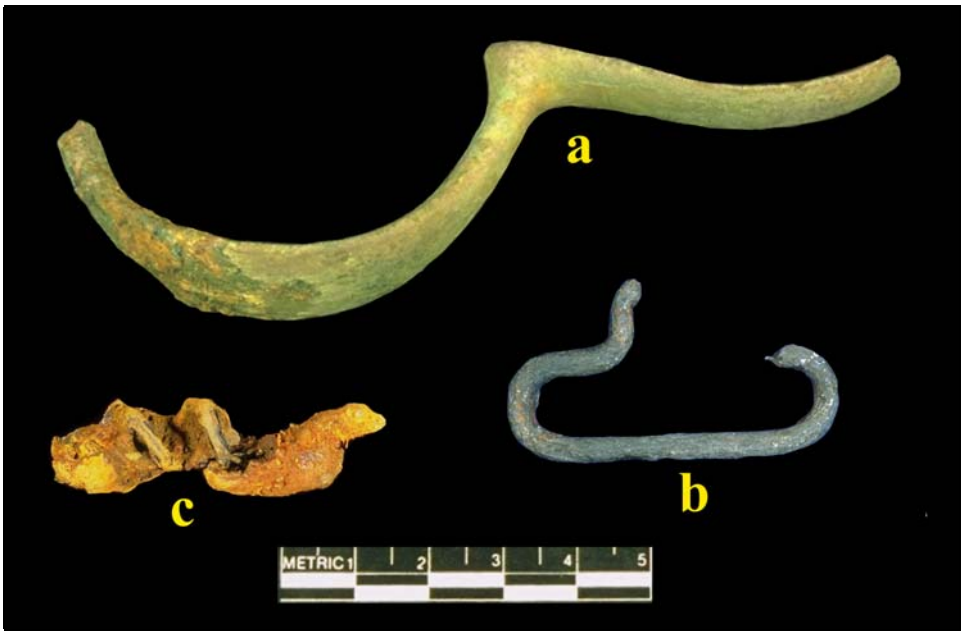

Figure 12.10. Trigger guard (a), sling swivel (b), and worm (c).

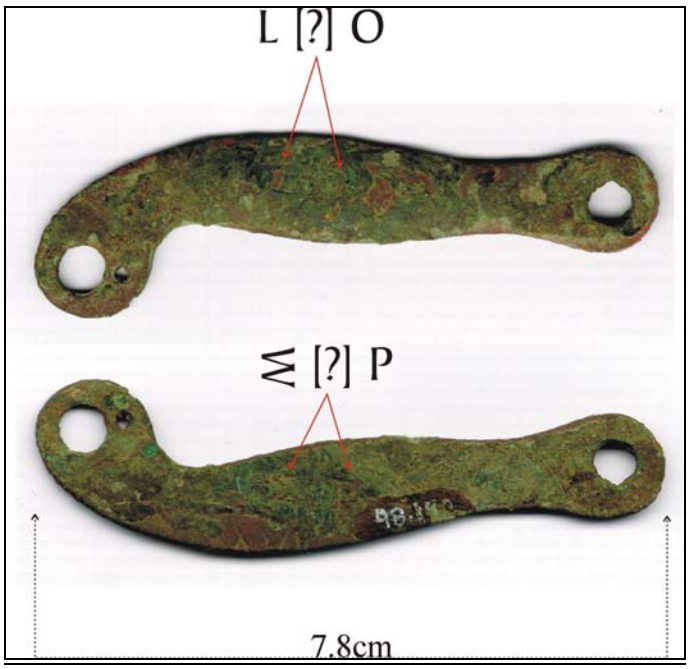

Figure 12.11. Sideplate with stamped markings.

Cartridges:

Excavations produced 38 cartridge casings and shot shells from upper disturbed deposits in the workshop area (Table 12.3). While most are modern, the assemblage spans the period from the earliest American military occupation to the present. Archaeologist Donald Spires, from a cursory examination of the data, observed:

> All marked UMC date from the later 1800s to around 1940. The military use of the 30 U.S. (30/40 Krag) dates from c. 1892-1903. The 6 mm UMC is the Lee (.236) Navy cartridge, in use from c. 1885–1910. No factory ammunition has been produced for this caliber since 1935. The 50/70 was standard military issue from 1867 to 1873, but may have lasted for several more years in Alaska until the modified MZ trapdoor Springfields could be replaced with the newly made 1873 45/70 caliber. The 45/70 dates from 1873 to the early 1900s for military usage, with civilian usage until present. The 38 long (Colt) dates from 1875 to present, or from 1865 to present if a 38 long RF, with a centerfire version being developed in the early 1870s. The 44 SWR (Smith and Wesson Russian) was developed around 1867-68 for the S&W Model 3 revolver. The Czar equipped his troops with this model [after 1870]. While a Russian military caliber, it was common on the western frontier with both civilians and the military [Spires 2002; also, see Barnes 1993].

In all likelihood, none of the cartridges would have been available in Sitka until after the 1867 transfer ceremony. Several specimens, such as the 50/70, 45/70, and 44 SWR probably relate to the American military presence in Sitka from 1867-1877. Although the popular .22 rimfire cartridge was developed in the 1850s, the recovered examples are attributed to modern usage based on style and markings.

Table 12.3. Cartridges from the Castle Hill workshop area, post-RAC levels.

Accession #	Catalog #	Unit	Level	Description
UA97.094	45838	shovel test 2	level 1	12 gauge UMC shotshell
UA97.094	40111	test trench 3	unknown	41 mag R P dud round
UA97.094	20634	N92 / E125	base of sod	.22 caliber rimfire
UA97.094	45677	N98 / E132	0-20 cm. BS	12 gauge shotshell
UA97.094	45539	shovel test 3	level 1	5.56 mm.dud blank
UA97.094	19987	N99 / E131	20 cm. BD	30 US UMC unfired
UA97.094	46201	N94 / E131	50.5cm.BD	45 / 70
UA97.094	45350	N105 / E138	0-20cm. BS	44 SWR partial
UA97.094	45582	N118 / E130.5	0-10cm.BD	6mm. US(A) UMC
UA97.094	42725	N96 / E125	30-45cm.BD	50 / 70
UA97.094	297	N129 / E108	85cm. BD	indeterminate
UA97.094	21914	N92 / E124	0-45cm. BD	50 / 70
UA97.094	20634	N92 / E125	0-40cm. BD	.22 caliber rimfire
UA97.094	5430	N101 / E134	unknown	45 / 70
UA98.052	10149	N97 / E136	level 4	12 gauge UMC shotshell
UA98.052	5597	N103 / E136	level 4	12 gauge UMC shotshell
UA98.052	5017	N108 / E136	level 1	12 gauge UMC shotshell
UA98.052	7513	N107 / E137	level 1	38 S&W SP. WRA
UA98.052	6978	N94 / E136	level 1	.22 caliber rimfire
UA98.052	1968	N106 / E140	level 2	.22 magnum rimfire
UA98.052	6480	N95.75 / E136.88	67 cm. BD	45 / 70
UA98.052	5022	N108 / E136	level 1	44 SWR partial
UA98.052	10017	Upper Trail	Surface	44 SWR UMC
UA98.052	694	N106 / E139	level 3	.22 caliber rimfire
UA98.052	5023	N108 / E136	level 1	38 LONG WRA co.
UA98.052	1010	N107 / E138	level 1	38 LONG WRA co.
UA98.052	1351	N106 / E140	level 3	(2) .22 caliber rimfire
UA98.052	6391	N95 / E133	level 1	5.56mm. Lo82 blank
UA98.052	5200	N104 / E134	level 2	44 SWR
UA98.052	1929	slope above bench	Surface	50 / 70
UA98.052	1116	N106 / E134	level 4	45 / 70
UA98.052	7912	N97 / E135	level 3	45 / 70
UA98.052	7521	N107 / E137	level 1	.22 magnum rimfire
UA98.052	2487	N108 / E137	level 1	44 SWR
UA98.052	270	N99 / E134	level 4	indeterminate
UA98.052	5751	N100 / E141	level 1	indeterminate WRA co.
UA98.052	517	N106 / E135	level 4	44 S&W
UA98.052	3524	N96 / E137	level 3	38 UMC

Conclusions

The arms and ordnance from Castle Hill document patterns of use and disposal consistent with interpretations of other material classes. Of the four buildings identified in the workshop area, two are interpreted as metalshops (Buildings 2 and 3) and one as a combination workshop and barracks (Building 1). The fourth structure (Building 4), considerably later that the others, was too disturbed to draw a conclusion based on archaeological evidence. The gun parts, some in broken condition, associated with Building 1 and 3 floor deposits suggest that small arms, probably solely flintlock, repair was one of several activities conducted within or around these structures. Gun parts were

notably absent from deposits associated with Building 2, which slightly predates Buildings 1 and 3. This building, which housed a forge, may have been too small and hot for prolonged activities such as gun repair. Khlebnikov, in his report for July and August, 1830, wrote of the specialized trades at New Arkhangel:

> Metalworkers in two shops. One worker is responsible for cleaning and repairing firearms from the arsenal; the other for repairing instruments in port and performing work on ships; for building, repairing locks, etc. Due to the large amount of work, it is seldom impossible to perform any new work [Khlebnikov, in Pierce 1994:140].

It is likely that Khlebnikov was describing Building 1 or 3 with regard to gunsmithing. The presence of gangmold sprue, lead spatter, and defective/discarded lead shot suggests that the workers were also manufacturing ammunition in the workshop area. Gun parts in the most recent structure (Building 4) may be the result of disturbance of earlier deposits, although a post-1861 powder can top is clearly within the range of use for Building 4.

Artillery ordnance, comprised of solid spherical iron shot, was more dispersed across the site. These items, mostly from disturbed context, are probably the products of day-to-day maintenance of the batteries. The sizes of recovered specimens are consistent with the use of Naval artillery that included swivel guns, six-pounders, 9-12 pounders, and 12-18 pounders. Interestingly, some of the larger projectiles were secondarily used as post supports for early 19th century structures. Spent cartridge casings in the collection are virtually all from disturbed context, and span the range of American use of the site after 1867.