construction crews were developed to assess the arguments regarding the failure of the shipyard.

Remote sensing surveys and limited subsurface testing of magnetic anomalies comprised the archaeological research. Although no specific evidence of the shipyard has been identified to date, the previously unknown location of a historic building, probably associated with the shipyard, was determined as a result of the surveys. Subsurface archaeological testing of this location, and a number of significant magnetic anomalies identified during the remote sensing surveys, is to be undertaken in the Fall of 1996.

FORT ROSS COVE:

HISTORICAL AND ARCHAEOLOGICAL RESEARCH

TO IDENTIFY THE REMAINS OF CALIFORNIA'S FIRST SHIPYARD

A Thesis

Presented to

the Faculty of the Department of History

East Carolina Univerisity

In Partial Fulfillment

of the Requirments for the Degree

Master of Arts in History

by

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August 1996

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Introduction

In 1812, the Russian-American Company (RAK), a quasi-governmental, mercantile fur trading company of the North Pacific, established its southernmost colonial outpost in the land Sir Francis Drake had named New Albion. Built on a flat coastal terrace some 70 miles north of the presidio and mission at San Francisco, the colony *Ross* (an early Russian word for Russia) was built to serve as a base of operations for hunting the valuable, fur-bearing sea mammals of the area. Ross was intended to be the agricultural base from which the company's outposts in the north could be supplied. As a quasi-governmental agency, the RAK also intended Ross to be a vehicle through which Russia could both assert claim to the territories south of the company's holdings in the northern Pacific, and facilitate trade with the Spanish in Alta California (Khlebnikov 1861:106; Bancroft 1885:79; Tikhmenev 1888:132).

These efforts met with only limited success. The colony never achieved true self-sufficiency and was never able to sustain an adequate level of agricultural production to reliably supply the company's other outposts. Moreover, by 1816 the hunters from the Ross colony had so depleted the surrounding population of sea mammals that the economic benefit of the colony's hunting activity had virtually evaporated, further increasing the already-burdensome cost the colony's sustenance placed on the company (Khlebnikov 1861:116).

In an effort to develop a new economic base to support the colony, Ivan Aleksandrevich Kuskov, the first administrator of Ross, introduced shipbuilding to the

colony when he ordered construction of one of the first sailing vessels to be built in California (Bancroft 1885: 640). A shipwright from company headquarters on Sitkha Island was transferred to Ross to conduct the enterprise and to train the unskilled labor force of the colony. During the next eleven years, he supervised the construction of six vessels at the edge of the cove that lay below the company's fort. Four of the vessels were brigs for the RAK, and two were smaller vessels built for the Spanish missions (Khlebnikov 1861:116; Bancroft 1885: 640). In addition to these ships, at some point prior to officially commencing the shipbuilding enterprise, Kuskov himself built a small vessel, referred to as either a small bark (Khlebnikov, 1861) or a rowboat (Kashevaroff, n.d.).

Within six years of their launching, each of the four RAK ships was declared unseaworthy due to severe wood rot and was subsequently abandoned or converted to use as a storage facility. As a result of the apparent deficiencies of the vessels, the shipyard at Ross was closed in 1827. The commonly advanced explanations for the failure of the yard to perform as a long-term economic enterprise are that the wood chosen to build the four RAK ships was unsuitable for the application, that it was improperly prepared, and that the skill and experience of the builders was not sufficient to the task (Khlebnikov 1861:116; Bancroft 1885: 640). To what extent each of these arguments is true is open to question.

The first argument appears to be a bit revisionist when considered in light of one of its proponent's original enthusiasm for the shipbuilding enterprise. Kyrill T. Khlebnikov,

an administrator of the Russian-American Company, occasionally visited California on the company's behalf and kept meticulous notes of his experiences and impressions there. In his *Travel Notes,* Khlebnikov wrote of a trip he made into the mountains near Ross in July 1820, some two years after the shipbuilding enterprise was underway. After observing the activities relating to the preparation of the wood for the ships, he wrote:

> The abundance of valuable trees gracing the hills and valleys was gratifying to behold. The curvature of the various types of oak was such that it will be easy, with the help of templates, to make all the parts needed for the ships. Even in its dimensions, the wood seems destined for this use. . . .suitable wood is no longer available in the immediate vicinity, but there is no obstacle to its delivery from farther away. . . .farther on there are entire wooded areas that promise to supply wood for shipbuilding for many years to come (Khlebnikov 1820:58).

This affirmation of the quantity and suitability of the timber for the shipbuilding effort seems to have been forgotten in the years that followed the yard's closure.

The arguments attributing the shipbuilding enterprise's failure to improper preparation of the timbers and the poor craftsmanship of the builders can be considered together, since one is a function of the other. Lending weight to their validity is an observation Khlebnikov made during the same July 1820 trip in which he describes the large amounts of wood that had been cut for use in shipbuilding but which had been discarded because of rot caused by improper treatment and storage.

In an effort to determine to what extent each of these factors contributed to the discontinuation of the shipbuilding industry, historical and archaeological research has been undertaken in California, at Fort Ross in particular, to address the following questions:

1) Can the placement and configuration of the Ross shipyard facilities be determined through location and identification of surviving sub-surface remains? If so, can the following questions be addressed through investigation of the archaeological record?

2) Can the design of the vessels and the level of craftsmanship employed in their construction be determined through an examination of the design and construction of shipyard facilities, the shipways in particular?

3) Given the technologically unsophisticated environment typically found in a frontier outpost, were modifications of 19th century shipbuilding techniques made in the construction of the vessels built at Ross?

4) Are such modifications manifest in the extant shipyard remains?

5) Can the archaeological evidence of the shipyard facilities at Ross be used to develop data that may be used in a comparison with the design and construction of the Russian-American Company shipyards at Sitka and Kodiak?

6) Will the archaeological record in any way reflect the interactions of the multiethnic workforce of Russian aristocrat, Russian peasant, Native Alaskan, and Native Californian that comprised the yard's construction crews?

Since neither the vessels built at Ross nor their remains are available for study, locating and documenting archaeological evidence of the shipyard itself may be the only means by which some insight into the level of craftsmanship employed in the construction of the ships may be gained. The following site report describes efforts completed to date

to address the questions posed above and to shed some light on the underlying issue of which factors were actually contributory to the failure of the shipbuilding enterprise.

Following Pierce (1984), the following historical summaries of the founding of the Russian-American Company and the establishment of the Ross colony employ a modified version of the Library of Congress system of transliteration for Russian place names, terms, and personal names. Modern Kodiak Island, for example, is spelled as Kad'iak, Sitka as Sitkha, etc.

Chapter 1

Formation of the Russian-American Company

Although the Russian-American Company operated in the ocean waters of the northern Pacific during the seventy year period from 1798 to 1867, the roots of its history reach back another 800 years to the beginning of imperialist Russia's remarkable expansion across the 4000 miles of Siberia. The factors and events that propelled Russian hunters, traders, and merchants eastward from mother Russia, through hostile and forbidding territories, to the Pacific shore must be considered as part of the company's story in order to establish a context for its policies and the ambitions of its principals. A brief synopsis of this long, complicated history follows.

Following the decline of loosely-united Kievan Russia in the late 11th century, numerous independant principalities arose in the general divisions that comprise the major eastern Slavic regions. One of the more important of these was the state of Novgorod the Great, whose "braves" contributed to the state's prosperity with their forceful incursions into the lands of Siberia, then known as Ugria (Baikalov 1932; Riasanovsky 1984). The *Chronicle of Novgorod* tells of many raids into weak Ugrian regions that returned large quantities of valuable sable, fox, and squirrel furs, important trading items in the commerce Novgorod conducted through the Hansiatic League (Riasanovsky 1984). One of Ugria's few successful attempts to challenge these intrusions is recorded in the *Chronicle of Novgorod* as occurring in 1032. This has become the earliest accepted date of Russian penetration into Siberia (Baikalov 1932).

Within two hundred years of this date, the Republic of Novgorod had expanded to incorporate the lands of Ugria, and become both the principal city of northern Russia and its greatest trading center. The lands of Novgorod stretched east to the Ural Mountains and north to the coast line of the Baltic Sea (Riasanovsky 1984:77).

In 1489, Ivan III (Ivan the Great), Grand Duke of Moscow, conquered Novgorod and gained control of Ugria. By the middle of the 16th century, forays into the territory had consolidated Moscow's northern holdings but the southern portion remained under the control of the Tartar Khans. In the period 1552-1557, Tsar Ivan IV (Ivan the Terrible) conquered two of the major southern tsardoms, gaining position as "Tsar of all Siberia." By 1585 Ivan had consolidated his holdings in southern Siberia and over the following sixty-five years, Russians from the north and south pushed across the entire land mass of Siberia. In 1649 the outpost of Okhotsk was established on the eastern edge of the continent on the shores of the Sea of Okhotsk (Sokol 1952).

This remarkable feat of exploration, conquest, and expansion was aided immeasurably by the riparian nature of the Siberian landscape. A land of numerous rivers, the largest of which are the Ob, Yenisey, Lena, and Amur, Siberia was traversed by means of a systematic colonization of successive river basins. Most of these broad, deep, and swift rivers run south to north, emptying into the Arctic Ocean. They are fed by tributaries so numerous, however, that it was possible to cross from east to west almost entirely by water.

The motivating force behind this eastward expansion was the insatiable market for furs, and the government revenues they would produce. As early as the 14th century, *promylshenniki* (fur traders and hunters - literally "enterprisers") from Novgorod were raiding the lower reaches of the Ob River in search of furs, portaging from tributaries of the Pechora River. The security established in the 16th century with the defeat of the Tartar Khanates, combined with the lure of rich hunting grounds to the east and the steady decimation of fur-bearing animals in European Russia, prompted the Russian government to encourage further eastward expansion through the domination of the river systems. The government supported the *promylshenniki*'s eastward movements by building a series of *ostrogs*, or blockhouses, on the rivers for defensive and support purposes.

In 1587, with the establishment of an *ostrog* at Tobolsk on the Irtysh River, Russia gained control over the basin of the River Obi. The *ostrog* of Eniseisk brought colonization to the Enisei River by 1625. Domination of the Lena River system began with the establishment of the *ostrog* of Yakutsk in 1632. It was from Yakutsk that subsequent expeditions into northeast Siberia began. The fifteen years following establishment of the Yakutsk *ostrog* were marked by steady eastward expansion and colonization of Siberia. The Kamchatka Peninsula was discovered in 1652 and the *ostrog* of Irkutsk in southern Siberia was established in 1654. It was the last in a chain of outposts leading back to European Russia (Figure 1)

The government's primary interest in this expansion was financial. Through the *promylshenniki* it collected an annual *yasak* (tribute tax) from the natives who had been

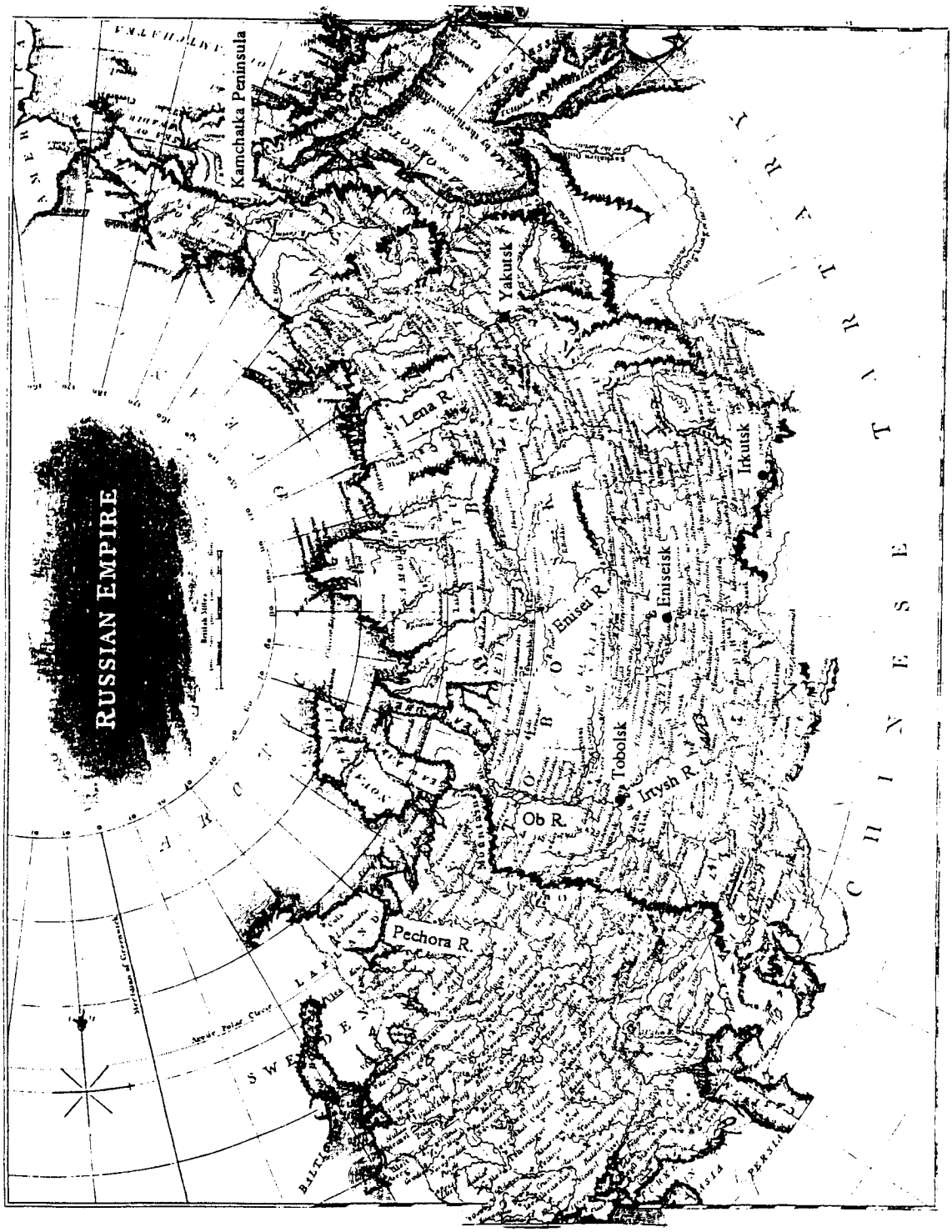

FIGURE 1. Map of the Russia Empire (Pawley 1819:Map XIII)

brought under Russian domination, and an additional tax from the hunters themselves by selecting ten percent of the best furs returned from each expedition. The crown also reserved the right of first refusal in purchasing the remaining ninety percent of the pelts. By the 17th century, the amount of revenue generated from these sources was a very important factor in State income - without it, Russia would have been a very poor country (Kerner 1948).

The entire span of Siberian territory from the banks of the Ob to the western edge of the Kamchatka Peninsula was traversed and subdued by the fur-seeking Cossacks and promylshenniki in a span of 120 years. Native resistance to the Russian incursion was strong, however, and it was not until an expedition led by the Cossacks Moroskoj and Atlasov in 1697 that Russia's grasp on Siberia became firm enough to allow the systematic plundering of its vast wealth of fur-bearing animals (Baikalov 1932).

In the late 17th century, the uninterrupted subjugation of the natives encountered in the eastward expansion was halted in the lower regions of the Amur River. There, in the Chinese people, the Russians met a foe that was culturally more advanced, better equipped, and more sophisticated than they. Although trading between the merchants of both countries had transpired in the region for several decades, the *promylshenniki*'s sporadic attempts to conquer the territory finally forced the Chinese to close their border. The Treaty of Nerchinsk, signed in 1689 by China and Russia, had far reaching effects on the fur trade and Russia's Siberian expansion for the next 170 years. Because of it, Russia was forced from the region, losing access to the ocean through the Amur Valley, as well

as a reliable source of grain and vegetables (Figure 2). Although trade was still permitted at Beijing, with the closure of the border that market was only accessible by water; forcing the Russians to concentrate on their settlements at Okhotsk and on the Kamchatka peninsula. A modification of the treaty in 1727 reopened the Chinese border at the settlement of Kiakhta, making this remote outpost in Mongolia an essential element in the bustling fur trade.

The discovery of sea otter in the northern Pacific Ocean added a new and powerful emphasis to the relentless search for furs, and drew increasing numbers of hunters and merchants. The rich, thick pelt of the otter quickly proved to be far more valuable than the skins of the fox, beaver, and sable that had previously dominated the trade. As more and more hunters, Cossacks, serfs, and merchants moved eastward, they were followed by agents of the crown who collected the state's ten percent tax as well as the *yasak* from the natives. The administrative system they brought quickly created a bond between the outposts at the eastern frontier and the capital at St. Petersburg. Information from the eastern Siberian natives about lands beyond the Pacific Ocean soon reached the capital and in the early 18th century, caused Czar Peter the Great to commission the first of several expeditions to determine whether a northeast passage existed between Europe and the Pacific, and whether Asia and America were linked at any point.

In 1648, the Cossack chief Deznev had sailed into the Arctic Ocean from the River Kolyma, doubled the Chukotsk Peninsula and landed at the mouth of the Anadyr River, having passed through the narrow passage later known as the Bering Straits. His

FIGURE 2. Map of Asia (Colton 1880:128)

discovery that the Asian and American continents were not joined was not considered important at the time and was quickly forgotten. Deznev's accomplishment notwithstanding, Vitus Bering, on one of several voyages commissioned by Peter the Great, was credited with the discovery of the straits that would later bear his name. Accompanying Bering on a second voyage of discovery, Aleksei Chirikov, in a separate vessel, reached the Alaskan coast, spotting several of the Aleutian Islands. He returned to Kamchatka in 1741 with over 900 otter pelts worth in excess of 54,000 rubles[1] in that market and almost double that amount at Kiakhta (Chevigny 1965; Wheeler 1965).

While Bering and Chirikov were exploring the northern regions, other explorers were commissioned to explore southward from the Kamchatka Peninsula. By 1742, several of the Kurile Islands had been discovered, as well as the eastern shore of Sakhalin Island. The process of colonizing these new-found areas was the same as that used in the river basins of Siberia. *Ostrogs* were established on the islands that were important defensive positions and the sea became the road over which supplies were moved in and furs carried out.

The discoveries of these lands, and the charts and maps that were related to them, were kept from the rest of the world because of the immense wealth of furs they possessed. Despite the effort at secrecy, voyages of exploration into the northern Pacific by the British Captains Cook and Vancouver, the French Captain Laperouse, and several Spanish explorers created enough anxiety in the later 18th century to have Catherine II,

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[1] A paper ruble in the 19th century was approximately equivalent to between .10 and .20 cents in American currency (Glenn Farris 1996, pers. comm.).

Peter's successor, order the Russian Navy into the area to assert Russian authority and enforce their claims there. War with Turkey, and later with Sweden, broke out before this could occur however, so it fell to the commercial interests in the fur trade to establish and maintain Russian sovereignty over the lands in the northern Pacific (Okun 1951; Tikhmenev 1888).

The Cossacks, soldiers, and *promylshenniki* who pushed the Russian borders ever-eastward were motivated primarily by the trade in furs. Pelts were obtained from the natives in trade and by hunting on the part of the *promylshenniki* themselves. In the latter approach, the brutal, uncontrolled collection of the furs left in its wake a decimated population of animals that forced the hunters to continually move eastward into new hunting grounds. When Chirikov returned with word of the immense quantities of furs available in the outlying islands, the merchants rushed to organize and outfit hunting expeditions.

The first commercial venture to the new lands was organized a year after Chirikov's return by the partnership of Emel'ian Basov, a sergeant of the Nizhne-Kamchatka garrison, and Andrei Serebrennikov, a Muscovite merchant,. Their combine built a small vessel and sailed to Bering Island, returning in 1743 with a cargo of pelts work 64,000 rubles. In 1745, Basov formed a second partnership with an Irkutsk merchant, sailed to both Bering and Copper (Mednyi) Islands and returned with a cargo of pelts valued in excess of 100,000 rubles (Chevigny 1965; Tikhmenev 1888; Wheeler 1965). Basov soon after retired from the military.

By 1750, numerous voyages to these and other islands in the Aleutian and Kurile chains had returned tremendous wealth, both to the merchants involved and to the crown, in the form of its ten percent government duty. The bonanza had its price, however. The fox, sable, and fur seal populations on the islands closer to the continent's edge were decimated and what otter were left deserted for the safety of the more remote islands.

Subsequent expeditions to the outlying islands required more men, larger ships and more time, making it too costly for all but a very few of the merchants to operate independently (Wheeler 1965, 1979). The need for large quantities of capital to support these ventures brought about a new form of business arrangement - partnerships between four or five merchants that each lasted as long as a particular expedition. Hunting practices, however, remained the same - as did the need to push further eastward in search of richer lands. As the distances to these more abundant and increasingly more remote areas increased, so too did both the costs and the risks. Capital invested in both ships and men was tied up for the long period of the voyages, greater distances increased the possibility of shipwreck, starvation, and scurvy. The *promylshenniki*'s cruel suppression of the natives encountered in the new lands was met with bitter resistance and bloody reprisal - sometimes to the destruction of entire companies.

By 1770, in search of the eastward-moving sea otter, the *promylshenniki* had discovered all of the Aleutian Islands, including Kodiak on the eastern side of the Alaskan Peninsula. During this decade, the merchants moved their base of operations from the Kamchatka Peninsula to Okhotsk, where it was both more convenient to build the larger

vessels they now required, and less expensive to import supplies from European Russia, which was 3000 *verstas* (approximately 2,000 miles) closer.

In 1773, a man arrived in Irkutsk from European Russia who was to affect both the fur trade and the course of Russia's eastward expansion profoundly. Grigorii Ivanovich Shelikhov had spent four years learning the business of fur trading in Irkutsk as an apprentice to the merchant Ivan Golikov. Satisfied with his training, he moved to Okhotsk in 1777 and entered the fur trade on his own. Rather than compete with other merchants in the pursuit of the sea otter, he invested in several voyages to the islands closer to the continent that, although stripped of the more valuable animals, still had populations of fur seals. He correctly realized that by eliminating the risks and reducing the capital required of the longer voyages to the Aleutian Islands, he could turn a profit on large cargoes of the lower-valued fur seals. His success in these ventures was such that by 1781 he was able to implement another business strategy that differed significantly from the traditions of the time.

As mentioned, partnerships were joined to raise capital, equipment, and men for the voyages to the Aleutian and other outlying islands to search for otter. These temporary partnerships were called "companies" and were intended to last only as long as the expedition. They were usually named for the principal vessel used in the voyage, or for the partner who had invested the most capital. The merchants who capitalized the expedition, the crew who directed it, and the *promylshenniki* who did the hunting comprised the company. The participants agreed to a contract that specified the portion

or "share" of the returned furs each would receive. Typically, shares were divided into two categories: general and non-participating. Each *promylshenniki* earned a general share that he divided in half with the merchants. Along with this and as part of his contract, each promylshenniki received a quantity of food and clothing that was to last the length of the voyage. The non-participating shares usually numbered about ten and were generally reserved for those not directly involved in the hunting (Wheeler 1965).

Shelikhov understood that this *ad hoc* approach to capitalizing expeditions was too costly, inefficient, and risky. He also recognized that the predatory hunting methods used by the unsupervised expeditions, and the ruthless treatment of the natives in the island chains, would eventually destroy the industry. The additional threat of encroaching competition from the British, French, and Yankees served to further fuel his concerns. To his former employer Golikov, Shelikhov proposed forming a permanent company to build and outfit ships for the hunting and trading of furs. The company would establish permanent trading posts on the American islands, as the outlying islands had come to be know, in order to establish Russian dominion in the area. These outposts would be the stations from which otter and other fur-bearing animals could be hunted. They would also serve as agricultural and scientific research stations, and as religious bases from which the gospel of Christianity could be preached to the natives. Shelikhov brought new definition to the concept of "shares" with his idea of a permanent company. No longer would the term refer to a portion of a particular voyage's cargo, but instead would represent an

amount of ownership in the permanent company, equal to the amount of capital contributed by each investor (Tikhmenev 1888; Wheeler 1979).

The Shelikhov-Golikov Company was officially organized in 1781. Its first undertaking was to build and provision three ships at Okhotsk, the *Three Saints*, *St. Simeon the God Receiver and Anna the Prophetess*, and the *St. Mikhail*. In August of 1783, with Shelikhov and his family in the *Three Saints*, a small expedition set sail for Kad'iak Island (Kodiak) to establish a colonial headquarters for the new company. Situated east of the Alaskan Peninsula, this location provided a convenient operating base from which the other islands could be colonized. It was far enough east to provide abundant sources of otter fur and was familiar enough to the Russian navigators that transit from the Russian mainland would not pose major difficulties.

With surprisingly little native resistance, Shelikhov was able to establish a number of bases on the islands and the Alaskan mainland over the following three years. Prior to his return to Irkutsk in 1786, Shelikhov placed Konstantin Alekseevich Samoilov, the foreman in charge of the hunters, in the position of temporary manager of all the settlements on Kad'iak Island (Tikhmenev 1888). Samoilov was left with specific instructions about how the colony was to be administered - instructions that encompassed everything from the direction each vessel was to sail in exploration, to how the natives were to be pacified and treated (Shelikov 1786). After an arduous journey, Shelikov arrived in Irkutsk in the spring of 1787. There he hired Evstrat Ivanovich Delarov as permanent manager of the Kad'iak enterprises, a position he held until July 1791. Delarov

is credited with establishing the first permanent Russian settlement in Alaska at Kenai Inlet in 1789 (Tikhmenev 1888).

In Irkutsk, Shelikhov found that trade over the Chinese-Russian border at Kiakhta, permitted since the Treaty of Kiakhta was signed in 1727, had been suspended in 1785 because of grievances lodged by the Chinese. This was a severe blow to the plans of the Shelikhov-Golikov Company, since Kiakhta was a major export depot for the Russian furs and an equally important gateway for the importation of Chinese goods, which the Company marketed in both Siberia and European Russia.

In response to this setback, Shelikhov petitioned the government to allow the British East India Company, with which Shelikhov had traded since 1780, to act as a middleman between his company and the Chinese. He argued that with his plan, the government would continue to receive import duties, and the high cost of transporting goods overland from European Russia into Siberia would be eliminated. He further argued that these cheaper goods would increase the Siberian people's standard of living and attract more settlers to the region, a circumstance of some importance to the Crown. Shelikhov offered the services of his company to act as sole agent in coordinating all trade and negotiations. His petition was denied.

In order to consolidate the company's position, and in an effort to recapture some of the capital invested in the young enterprise's ambitious undertakings, Shelikhov and Golikov petitioned the Empress again in 1787 for governmental support. The boldness of their commercial venture is reflected in the substance of this letter to Catherine. In it, the

entrepreneurs described in some detail their activities and accomplishments before launching into their request, the first of which was that the company be placed under the direction of the Governor-General of Irkutsk. This was an attempt to avoid any interference from the authorities at Okhotsk or on the Kamchatka Peninsula. They also requested the right to correspond directly with the Empress, an apparent attempt to eliminate any future interference from a governor who might not be favorably disposed towards the company. They requested 100 government men - armorers, cannoneers, shipwrights, priests and deacons - all to be transported and maintained by the company. They next sought the right to trade with Japan, China, the Philippines, Korea, the Spanish and the Americans (Eskimos and Indians). Two of their petitions were particularly brazen. The first was for a twenty-year loan of 200,000 rubles, justified because the company's capital was invested in the establishment of the permanent colonies and its liquid capital was locked in the furs that were not salable because of the suspension of trade at Kiakhta. The second requested the Empress "to protect us and our property from those who would wish to profit by our discoveries, so that they would not cause violence and oppression to our business, and would not disrupt and destroy that which has already been and shall be organized by us" (Shelikov and Golikov 1788). This last request was especially brash in view of Catherine's concerted efforts to do away with those special privileges that had traditionally been accorded the ruling class. Her belief in an anti-monopoly, free-trade economy was especially strong.

The petition was sent to the Empress by way of Governor-General Iakobi of Kamchatka. He recommended the requests be granted and passed the petition onto the Commission of Commerce in St. Petersburg. The Commission approved the request and added that an official commendation, sword, and medal be awarded to the company's principals. With this, the petition was passed for final review onto the Permanent Council which also approved it and sent it to the Empress in April of 1788. During this period, Shelikhov and Golikov had been busy in the capital, lobbying for their cause. As Catherine's secretary, Aleksandr Khrapovitskii, put it "It was noted how all took care of Shelikhov so that he could get the monopoly. He had bribed them all" (Khrapovitskii 1901).

Despite these efforts, Catherine responded to Shelikhov's proposals by denying all but one of his requests. The petition for manpower was denied because of the shortage of personnel in Siberia. The loan was denied but no reason was offered. Catherine's anti-monopoly philosophy was cited as the reason for denial of the request for exclusive privileges. Catherine did agree to reward the entrepreneurs, and ordered that they each receive silver swords and gold medals inscribed with her picture.

It is possible that the entrepreneur's lobbying efforts in the capital to expedite their request may have been too fruitful. The effusive, laudatory tone of the various commissions' reports apparently aroused Catherine's suspicions, especially since none of the commissioners had personally inspected any of the claims the company had set forth. (Wheeler 1965).

Despite this setback, Shelikhov continued to send ships and supplies to the northern Pacific, strengthening his colonial outposts and founding new ones while simultaneously cultivating his political contacts at the Empress' court. His fortitude and perseverance in the face of this rejection would ultimately be rewarded.

With publication of the accounts of Cook's 1778 voyage to America, Catherine's apparent lack of interest in the eastern colonies changed. Her concern that the British, through the British East India Company, were trying to establish a claim to the fur territories in the northern Pacific was one reason she had refused to allow Shelikhov's company to use them as middlemen during the time the Kiakhta gateway was closed.

To address her concern, Catherine ordered implementation of measures that had been proposed by her Board of Trade. These consisted of a statement made to the maritime powers that the American coast from 55°21' North latitude belonged to Russia. Included in this was a claim to the Aleutian, Kurile, and Fox Islands as well as all those islands situated near the mainland and Alaska. To reinforce this statement, the Navy was ordered to send a squadron from the Baltic to the northern Pacific. In conjunction with this, Governor Iakobi of Irkutsk sent a secret missive to Shelikhov's headquarters on Kad'iak, instructing the manager there to raise the Russian standard in all their territories to enforce the Russian claim to the land. He instructed that on all lands under their jurisdiction, iron plates be buried "with the image of a copper cross superimposed and the following words in copper letters: 'Land under Russian Domain.'" These were to be buried so that "not only were the native inhabitants not to see them, but they were also to

be hidden from every one of our Russian workers so that, by keeping this secret, the inhabitants might be prevented from guessing that the tablets were placed there in the present time" (Iakobi 1787; Tikhmenev 1863).

Wars with Turkey and Sweden prevented the dispatch of the naval squadron, a fact that would ultimately work in Shelikhov's favor. To cement their claim to the eastern territory, the crown began to consider forming a powerful, monopolistic organization, similar to the East India Company, that would be able to resist both the encroaching competition of foreign merchants as well as the efforts of foreign governments to gain a foothold.

In 1790, Shelikhov sent another letter to Catherine by way of Governor-General Pils of Kiakhta, who had replaced Iakobi in 1789. This letter outlined the Company's plans for further exploration, for the establishment of permanent settlements on the Kurile Islands in order to attempt trade with Japan, Formosa and Macao, and explained plans to introduce agriculture and cattle-breeding to the American colonies. Although no mention of a loan was made in this letter, permission was sought for the company to purchase serfs, and for the right to bestow rank. Catherine did not respond to this letter.

Later in 1790, with the death of Mikhail Golikov, nephew of Ivan and a junior partner in the Shelikhov-Golikov Company, the company was reorganizated. The new company was named the Northeastern-American Company and took in as partners several individual traders who were no longer competing. In 1790 and 1791, two temporary companies were also founded, the Baptist Company, which sailed for the Fox and Pribylov

Islands, and the Unalaska Company, which sailed for that island. Fearing that his rapidly expanding enterprise would falter without proper management, Shelikov convinced Aleksandr Andreevich Baranov, a successful merchant of Kargopol, to become Chief Manager of the company's colonies. In 1790, Baranov departed Okhotsk to assume his new position on Kad'iak Island. He arrived in July of 1791 and replaced Delarov, who returned to Irkutsk with the furs obtained during his tenure as manager at Kad'iak (Tikhmenev 1888). Baranov was to guide the company's colonial outposts for the next 28 years.

In April of 1792 the Chinese border was re-opened at Kiakhta. Its seven year closure had interrupted trade and while this had damaged the Northeastern-American Company, it destroyed virtually all of its competitors. Only the companies owned by Pavel Sergievich Lebedev-Lastochkin and the Kiselev brothers were still engaged in the fur trade by 1795. The competition between these companies was fierce, despite the fact that Shelikhov personally invested in a number of the Lebedev-Lastochkin voyages.

In 1793 Shelikhov wrote the Empress again, reporting on the company's success in building a shipyard at Resurrection Bay on Chugatsk Sound and argued that, in order for their agricultural projects in the colonies to be successful, they required agricultural and artisan serf families in the colonies. In December, Catherine ordered that 20 artisan and 10 agricultural serf families be granted to the company from those in Siberian exile. This was in direct conflict with two of her earlier decrees, which reserved only to the *dvoriane* (nobility) the right to own serfs (Dmytryshyn 1989; Tikhmenev 1888).

In their petition of 1787 to the Empress, Shelikhov and Golikov had stressed the need for a complement of priests in the colonies, to be sent and maintained at company expense. The company's purpose in this was more to impress Catherine than to propagate the faith. In 1793, the Metropolitan of Novgorod was ordered by the Empress to begin formulating plans for the establishment of a mission in America. Shelikhov interpreted this to mean that his request for a monopoly would soon be granted, and he began reorganizing his companies once more.

The Baptist Company and the Unalaska Company were incorporated into a new, permanent company called the North-American Company, which was organized under the same rules as the Northeastern-American Company (Tikhmenev 188:26). These two companies worked together closely, exchanging ships and crews. By 1794, the Northeastern-American Company had received the privilege of paying customs duties by promissory note in European Russia, instead of by cash in Kamchatka. As further evidence of her growing support, while the company's ships were employed elsewhere, the Empress permitted the use of government vessels to transport the members, provisions, and equipment of the Kurile Company to the Kurile Islands where they were to establish a permanent colony (Tikhmenev 1888; Wheeler 1979).

In July 1795, Grigorii Ivanovich Shelikhov died, leaving his widow, Natal'ia Alkseeva, to assume control of the Northeastern, North-American, and Kurile Companies. Competitors immediately began challenging the preeminent position the Shelikhov

companies held in the fur trade but Shelikhova, with the help of her son-in-law, Nikolai Petrovich Rezanov, fought off the challenges.

In 1797 merchants at Irkutsk, under the direction of Prokop'evich Myl'nikov, formed a joint stock company similar to that of the Shelikhov-Golikov companies with the intention of driving Shelikhova out of business. The charter granted by the government to the Irkutsk Trading Company of Myl'nikov and Associates specified that the operations of this new company could in no way harm those of the Shelikhova companies. By the time this charter was granted, the Irkutsk Trading Company, having been undercapitalized at the beginning, was facing bankruptcy. The principals approached Golikov, who had withdrawn from active participation in the renamed American-North, Northeastern, Kurile Company, with a proposal for merger. Under threat of having Golikov withdraw his capital from the firm, Shelikhova agreed to the merger and in July of 1797, the United American Company was founded (Wheeler 1979; Tikhmenev 1888). The company's charter was forwarded to St. Petersburg for approval. There, it was amended with an instruction to the Irkutsk governor to insure that all merchants in the north Pacific fur trade be included in the company. This proviso obviated any discussion about a monopoly. Despite this, much opposition to the charter was voiced by some of the merchants, Lebedev-Lastochkin and the Kiselev brothers in particular.

The Commerce College, 18th century precursor to the Ministry of Commerce (Riasanovsky 1984:231), was overseeing the charter's development and eventually realized the futility in trying to achieve a unanimous agreement among all the parties. The

collegiate administration consequently ordered preparation of a final report about the charter. This report stipulated that the charter must allow other merchants to join in the future, that those merchants who chose not to join only be allowed to trade until their present voyages ended, that stockholders be prohibited from individually competing in areas where the company was operating, and that the company's stock should be open for sale to all loyal subjects, not just those participating in the trade. The report further suggested that the company be named the Russian-American Company.

On July 8, 1799, Czar Paul I, who had assumed the throne on Catherine's death in 1796, signed the charter granting imperial protection and patronage to the first Russian joint stock company. For a period of twenty years, this company was granted the exclusive rights to

> . . . profit from all hunting and other ventures presently established along the coast of America to the northeast . . . from . . . 55° to the Bering Strait and beyond and likewise on the Aleutian, Kurile, and other islands located in the North Pacific Ocean. . . . to make new discoveries, not only above 55° northern latitude but to the south as well . . . [to] utilize, without any claims from others, everything above and below ground in places it has already discovered or may in the future discover. . . . [to] build settlements and fortified places wherever necessary for the safety of its employees. . . . [to] sail to all nearby nations and enter into trade with all adjacent powers . . . ." (Dmytryshyn 1989:18-19).

Though he missed living to see it by a scant four years, Shelikhov's dream of obtaining a monopoly of the Russian fur trade had finally been realized.

Chapter 2

Expansion into California

The Russian-American Company's expansion into the northern region of Alta California was motivated by several factors. The abundance of sea otters in the Pacific's southerly waters was a powerful attraction, especially in view of their declining numbers in the hunting grounds of the north Pacific. The monarchy's imperialist interest in extending Russia's influence to the west coast of North America was also a factor. More important, however, was the prospect of establishing a local base from which the Russian colonies could be supplied. The company's northeastern outposts on the Kamchatka peninsula were supplied overland from mother Russia. A reliable extension of that supply line to the northwestern colonies was impossible, however, both from a cost standpoint and because the supplies received at Kamchatka were barely enough to sustain those colonies (Okun 1951:119). To address the perpetual shortages of supplies and provisions in the northwest colonies, and at New Arkhangel in particular, Baranov established trading relationships with several Yankee captains who bartered goods, supplies, and armaments in return for the company's furs. While these exchanges alleviated the colonies' shortages, they also served to encourage a "foreign" presence on the northwest coast, a situation looked upon unfavorably by the company administration. ". . .we are now taking measures to drive these gentlemen off, but the innumerable sounds and straits in our waters prevent us from being very efficient in that" (Rezanov 1806a:218).

Consequently, a sustainable and dependable "granary" was required for the colonies, and efforts to develop such a resource in Kad'iak, Kenai Bay, Yakutat, and on Sitkha had all met with failure (Tikhmenev 1888:83). Establishment of the company's southernmost colony of Ross in Alta California was another attempt to address this need.

Prior to establishing Ross, however, the RAK, in conjunction with the imperial government, authorized the first round-the-world voyage of supply for the company's colonies in the north Pacific. The expedition departed St. Petersburg's harbor of Kronshtadt in July 1803 under the command of Nikolai Petrovich Rezanov, Shelikov's son-in-law, Chamberlain of the Imperial Court, and Plenipotentiary in America. On his mission, Rezanov represented both the crown and the company in his numerous diplomatic and commercial dealings. He was charged with the responsibility of determining the needs of the colonies and was empowered to provide for them to the extent it was possible (Tikhmenev 1888:72). After a failed attempt to establish commercial and diplomatic relations with Japan, and after sending the supply ships ahead to Sitkha , Rezanov traveled through the company outposts at Kamchatka, Unalaska Island, the Pribylov Islands, and Kad'iak Island, finally arriving in New Arkhangel in August 1805.

By February 1806 the colonies' supplies were low and the wreck of a supply ship from Kad'iak and the delayed arrival of a second supply ship from Okhotsk had created a desperate state of affairs at New Arkhangel. Scurvy was beginning to take its toll and

starvation was imminent. On February 15, 1806, in a secret letter to the Board of Directors, Rezanov wrote:

> We gave wheat only to the sick and at that only three pounds per man, the rest lived on iukola. . . . There is very little iukola left and it is not a pleasant prospect to be entirely without food. . . .We gathered snails and clams during full moon, when they are edible, at other times we have shot eagles and crows; in fact we have been eating everything we could get. . . . To get supplies for this country I must sail to California. I hope to leave about the 20th of this month. The equinox threatens storms but staying here means famine. Finding myself in such a critical situation, I prefer to face storms rather than hunger (Rezanov 1806b:176).

With a scurvy-ridden crew, Rezanov sailed for Alta California on February 25, 1806, arriving at San Francisco Bay on March 24 "ashen and half-dead" (Rezanov 1806c:113).

Despite Spain's strictures on colonial foreign trade, Rezanov convinced the Spanish provincial governor to allow the missions at San Francisco and Monterey to supply him with desperately-needed grain, tallow, butter, salt, and other foodstuffs in exchange for the trade goods carried in the Russian ship. After six weeks, during which Rezanov unsuccessfully attempted to establish a permanent trading relationship with the Spanish, he returned to New Arkhangel, where he found that scurvy had decimated a large portion of the populations of Sitkha and Kad'iak. With the provisions obtained in California, health improved for the colonists and Rezanov began preparations to return to St. Petersburg. Prior to departing, he dispatched a detailed report on California to the Russian Minister of Commerce, Nikolai P. Rumiantsev. In this report, Rezanov first suggested his plan to gain a foothold in California, with the long-term intention of establishing Russian dominion over the entire territory (Okun 1951).

> ...if [we] could obtain permission to develop trade with California, the Company could build granaries in conjunction with it, . . .we could also develop agriculture and livestock production. . . . With no great expense from the Treasury this entire region could be brought permanently under Russian control. . . . A part of the territory is still unoccupied, which could be so beneficial and vital to us" (Rezanov 1806c:130).

Rezanov sailed from New Arkhangel in July 1806, but before departing he left precise instructions for Baranov regarding the conditions he had observed in the colonies. One of these instructions addressed Rezanov's interest in establishing a presence in California.

> . . . the most reliable source [of foodstuffs] are the coasts of New Albion to which I shall endeavor to attract the attention of the Government to the end that through the establishment of our settlements there, by sending Jesuits and missions, we could utilize the innumerable Indian aborigines for the establishment of agriculture which, because of the fertility of the land, will prove as successful as in California (Rezanov 1806d).

In 1809, the company's directors requested and received permission from the emperor to establish a settlement on the coast of Alta California. Anticipating this authorization, the directors had previously instructed Baranov to dispatch an advance party to investigate suitable locations for establishing such a settlement. Following this directive, in 1808 Baranov ordered his assistant, Ivan Aleksandrovich Kuskov, to sail to New Albion, as Francis Drake had named the coast, to survey for prospective sites. This voyage met with mixed success. One of the two dispatched vessels was lost, but Kuskov's returned with a large quantity of sea otter furs. A suitable location for a settlement had been identified but a shortage of building materials and discontent among the crew forced

Kuskov to return to New Arkhangel before he could formally establish the new outpost (Tikhmenev 1888:133). Kuskov attempted to return to the coast of New Albion again in 1810, but was attacked near the Queen Charlotte Islands by well-armed natives and had to return to New Arkhangel. In 1811, however, Kuskov succeeded in founding a settlement in California on a small inlet some 20 miles north of present-day Bodega Bay, then called Count Rumiantzoff Bay by the Russians. Although the inlet would quickly prove unsuitable as a landing for ships and cargo, the location offered "vast forests to furnish building materials, fertile soil and large pastures for the raising of cattle, besides a good supply of most delicious water and water-power. All these advantages were wanting in Count Rumiantzoff Bay" (Khlebnikoff 1835:128).

Kuskov formalized the company's ownership of the location by exchanging gifts, Russian medals, and assurances of friendship and protection with the local native California leaders in return for title to the area he needed for the settlement (Khlebnikov 1861; Tikhmenev 1888). After obtaining title, Kuskov returned to New Arkhangel to plan the settlement's construction with Baranov. In November of 1811, he returned to the site in New Albion with 25 Russian laborers and commenced building the fort.

> In the beginning of 1812, Kuskoff [sic] had got out all his timber and in June finished the village Ross, lat 38° 33' N., long 123° 15' W (Greenwich), at the foot of some mountains, but still at a height of more than 120 feet above the sea-level. A fort was constructed 49 fathoms long by 42 wide. In quick succession a Governor's residence, barracks, storehouses, etc. were erected (Khlebnikoff 1835:128).

It was the officially-stated intention of the company to introduce farming at the Ross colony, in addition to developing cattle breeding and raising hemp, and "with its mills and other economies . . . [to] provide, in time, not only a sufficient quantity of our own supplies for the subsistence of the people and the rigging of ships, but to send a large surplus of them to Kamchatka and Okhotsk, and thereby save these regions from the expensive importation of the many required things from Russian and Siberia" (Council of the RAK 1814).

The Spanish colonial government officially opposed the Russian presence, insisting on numerous occasions that the fort be dismantled and the Russians leave the coast of New Albion. Refuting Spain's claim to the coast of New Albion, the Russians cited testimony of the native Californians as to their independence of the Spanish and the consequent legitimacy of the sale of the site to the RAK. The company also argued that Spanish authority had never actually extended further north than the port of San Francisco, and that Spanish territorial claims in general were questionable, as evidenced by the occupation of the mouth of the Columbia River by the United States government, and the determination that the southern border of France's Louisiana was declared to lie at the 42nd parallel, 5 degrees south of the Straits of Juan de Fuca - territory to which the Spanish had previously laid claim (Khlebnikov 1861).

Despite the official demands that the Russians leave the coast of New Albion, unofficial trade between the Spanish at San Francisco and Monterey and the Russians at Ross occurred regularly. "The missionaries and other inhabitants became acquainted with

their new neighbors and supplied them with livestock, grain, and poultry, in defiance of their own government's prohibition of this very thing" (Khlebnikov 1861:114).

To preclude further Russian expansion, Alta California's Governor Don Pablo Vicente de Sola established two new missions in lands north of San Francisco Bay, Mission San Rafael in 1819 and Mission San Francisco de Solano in 1824. "The missionaries needed various materials and tools to construct these buildings, and had constant intercourse with Fort Ross. The travel distance in good weather was only one day, so there were uninterrupted relations. Kuskov received livestock from them as well as various supplies which were transported from the missions in baidarkas" (Khlebnikov 1861:115). Despite this trade relationship and the continual efforts of Kuskov to obtain permission to hunt in Spanish waters, the Russians were never officially allowed to hunt sea otter in San Francisco Bay. Elsewhere on the coast, their rapacious hunting strategies soon decimated the populations of fur-bearing sea mammals and by 1817, the sea otter had become virtually extinct from Trinidad Bay to Monterey and the fur seal from the Farallon Islands (Tikhmenev 1888).

The agricultural effort at the Ross colony did not fare well, either. The Aleuts, Russian creoles, and native Californians apparently did not willingly embrace the agricultural lifestyle. In a report to the Board of Directors dated November 6, 1818, Ludwig von Hagemeister, who had replaced Baranov as Chief Manager on February 1, 1818 (Pierce 1986), discussed this situation:

> Concerning the agriculture (in the colony of Ross), I am obliged to destroy the agreeable idea which, judging by the quality of the climate has been formed and cosoled [sic] in the distance. The first inconquerable at the present time

> impediment consists in not having sufficient hands. The workmen sent from Sitkha, excluding a few, are the worst of the worst , not accustomed in Russia to work or labor, . . . the Aleutians for this kind of work are also unqualified, and constant and long examples are necessary to incline them to these new occupations . . . (Zavalishin 1866:np).

The location of the compound itself added to the difficulties. The moist sea air, frequent fogs, and intermittent sunshine typical of California's north coast retarded the growth of grain. What grew near the shore was covered with rust. Gophers, mice, and squirrels were formidable pests and the tillable soil adjacent to the fort was quickly exhausted. "Besides [this], there was another reason for agricultural failure in the stupidity and ignorance of both Russians and Aleuts, who were perhaps the worst farmers in the world" (Bancroft 1886:638). The vast and fertile lands in the interior could have been used to produce bountiful crops, and in fact, two small farms were eventually built between Ross and Bodega, but a large Russian incursion into the rich interior would have further jeopardized the already-tenuous relations with their Spanish neighbors. Penned in by the new Spanish missions in the north, the presidio and mission at San Francisco to the south, and the ocean to the west, the Russians were forced to capitalize on the agricultural and pastoral lands that were then available to them. Although never achieving the success originally envisioned, the agricultural effort eventually began to yield an adequate return and by 1826 the agricultural and pastoral industries were producing enough grain, fruits, and vegetables, cattle, and sheep to supply some of the needs of the colonies in the north Pacific (Bancroft 1886:638; Tikhmenev 1888:224). In addition, a small industrial complex at the colony became the source of bricks, iron products, leather goods, wooden barrels,

pine resin, and a variety of other products, all of which added to the economic viability of the enterprise as its primary function, the procurement of furs, began to decline.

In an attempt to develop an enterprise to replace that of hunting fur-bearing sea mammals, Baranov suggested the colony establish a shipyard and begin capitalizing on the proximity of the abundant forests that surrounded the fort (Khlebnikov 1861). Kuskov took the recommendation to heart and in 1816 he established the first shipyard on the west coast of what would later become the continental United States. Over the next eleven years, a polyethnic labor force comprising Russians, native Alaskans, Hawaiians, and native Californians built at least seven sailing vessels for use by the company or sale to the missions. Like the agricultural effort, however, this enterprise met with only limited success and was abandoned in 1827.

Chapter 3

The Shipyard at Colony Ross

The depletion of Alta California's fur-bearing sea mammal population and the disappointing performance of the Ross colony's agricultural efforts led to financial losses for the company, putting Ross in danger of becoming a financial burden. To develop an economic enterprise sufficiently prosperous to replace these losses, Kuskov ordered the establishment of a shipyard in the cove below the colony's stockade. There in 1816, the keel was laid for the first sailing vessel to be built in Alta California.

Shipbuilding had already been a successful enterprise at Sitkha as early as 1805. In his tour of the colonies, Rezanov had recognized a shortage of sailing vessels and ordered construction of what Khlebnikov later described as a tender (Khlebnikov 1861:9). Following this example after Rezanov's departure, Baranov contracted with an American shipwright named Lincoln (sometimes spelled "Linken") in 1806 to build ships for the company in Sitkha (Khlebnikov 1820). During the following three years, Lincoln built three new ships and retimbered or repaired two others at the Sitkha shipyard. After his departure from Sitkha in 1809, no new ships were built there, although a *promylshennik* named Mukin undertook the repair of several older ships (Khlebnikov 1861:9). During the period when the yard was in operation, Lincoln trained a young *promylshennik* from the Irkutsk region named Vasilii Grudinin in the art of shipbuilding. It was Grudinin who volunteered to leave Sitkha for the Ross colony in order to build ships there.

From 1816 to 1827, Grudinin directed the construction of six vessels in the Ross shipyard. In addition, prior to Grudinin's arrival and the commencement of shipbuilding activity, Kuskov himself built a small vessel referred to as either a small bark (Khlebnikov 1861) or a rowboat (Kashevaroff n.d.).

The first four of the vessels built by Grudinin were constructed specifically for the company's use. The last two were built for the missions, one in 1826 and the other in 1827. "The Russians . . . built in 1826 a new boat with sails and rigging for the Mission at San Francisco for 1200 piastres; and in 1827 also built a fully equipped barge [barque?] for the Mission San Jose for 1500 piastres" (Kashevaroff n.d.). The four company vessels were constructed in the shipyard at Ross, launched, then transferred to the Russian's port at Bodega, Port Rumiantsev, for fitting-out and loading (Lutke 1818).

The keel for the first of these vessels, a schooner (Bancroft 1886:640; Bunje 1937) or a brig (Khlebnikov 1861:116) or a brigantine (Golovnin 1819:166; Tikhmenev 1888:150) christened *Rumiantsev*, was laid in 1816. Finished in 1818, *Rumiantsev* was chiefly built of oak (Bancroft 1886:640; Tikhmenev 1888:228) and was rated at 160 tons displacement by Khlebnikov (1861), but was described as being only 80 tons by Fedor P. Lutke during his visit to California in 1818 (Lutke 1818). This may be simply a difference in judgment, albeit a substantial one, or it may be attributable to the different ways to describe a ship's tonnage. Khlebnikov was citing displacement tonnage and Lutke may have been referring to tons burthen. *Rumiantsev* was used primarily in Sitkha, under the command of a Lieutenant Livoron, until 1823, when it was abandoned (Bunje 1937).

As a reward for completing the vessel, Grudinin was given a bonus and something of a promotion from the rank of *promylshennik.* In a letter to Kuskov, Fleet Captain-Lieutenant Cavalier Leontii A. Hagemeister, successor to Baranov and Chief Manager of the Russian-American Company from January to October 1818, gave the following instruction:

> Please inform company employee Grudinin that I have applied to the Main Office about a bonus for him for building the vessel *Rumiantsov* [sic], of a single payment of 500 rubles, which payment please place to his credit, charging it to the account of that vessel. . . . As you report that Grudinin is offended at being in the position of an ordinary fur hunter, I am raising his pay from 300 rubles to 450 rubles, effective 1 May of this year 1818, and it will be left to the Main Office to offer such a reward as it deems suitable to him for special services, taking into consideration his increase in salary in comparison with the others (Hagemeister 1861:118).

Described in 1818 as "very well built, judging from its outward appearance" and not looking "as if it had been built by a simple promyshlennik" (Lutke 1818:281), *Rumiantsev* was declared unseaworthy a mere five years after its launching because of the "open rot in all parts" (Khlebnikov 1835).

Buldakov was the second ship to be built in the Ross shipyard. Its keel was laid in 1819 and the vessel was launched in 1820. Copper-sheathed, *Buldakov* was a 200-ton brig, also primarily built of oak (Bancroft 1886:640; Tikhmenev 1888:228). The ship, whose maiden voyage was made to Santa Barbara, was in active use until 1826, when it was stripped and placed into dry-dock in Sitkha to be used as a storage facility for wheat (Bancroft 1886:640; Khlebnikov 1861:116). A slight discrepancy exists in the historical record regarding the construction dates of the *Buldakov*. During his 1818 visit to

California, in addition to his comments on the *Rumiantsev*, Lutke also remarked on the *Buldakov*, which he described as "still in the building slip in Ross, but . . . already in its final stages" (Lutke 1818: 281). In describing the 1820 shipwreck of the *Il'men* at Cape Barro de Arena (modern Point Arena) however, Khlebnikov mentions some of the cargo of the wrecked vessel. "Then we unloaded lead, sheet iron, white rosin, and pitch for the brig *Buldakov*" (Khlebnikov 1820:46), indicating that the *Buldakov* was still not finished. In regard to his ability to assess ships, their size, and seaworthiness, perhaps Lutke's judgment should be called into question. He is in serious disagreement with Khlebnikov's evaluation of the size of *Rumiantsev*, he describes the vessel, out of service in five years, as being "well-built," and presents *Buldakov* as being nearly completed two years before the vessel was actually launched.

Khlebnikov (1861:116) and Bancroft (1886:640) both state that *Buldakov*'s keel was laid in 1819 and that the vessel was finished in 1820. Furthermore, there are many references in Khlebnikov's travel notes of 1820 regarding *Buldakov*'s fitting out at Bodega. On July 6, for example, the crew list for the vessel was made and the men were sent to Bodega. On the ninth the ship's boat left Ross for Bodega "carrying copper sheets and craftsmen to finish the planking for the *Buldakov*" (Khlebnikov 1820:58). On July 16 a small baidara set out for Bodega

> . . . with the two anchors, the large anchor cable, two small cannon, iron, glassware and hardware, and various products in barrels for the *Buldakov*. Mr. Schmidt accompanied them. Any goods that could not be loaded on the ship immediately were to be placed in the warehouse, and a guard was to be posted" (Khlebnikov 1820:64).

Three days later "Mr. Schmidt returned from Bodega and reported the *Buldakov* was ready . . . " (Khlebnikov 1820:65). This strongly suggests that Lutke erred in reporting his September 1818 observation of the *Buldakov*. His diary in which this is recorded appears to be a mixture of contemporary observation intermixed with historic background, so perhaps it was rewritten after the fact and he confused actually seeing the *Rumiantsev* in the shipways in late 1818, with what he later learned of the *Buldakov*.

In his *Travel Notes* for July 25, 1820, Khlebnikov describes a meeting he had with Grudinin, who had just finished the *Buldakov*. Plans were underway for the construction of a third ship but Grudinin was displeased with his rate of pay, the subject of which apparently comprised the topic of the meeting. Subsequent to their meeting, Khlebnikov recommended another pay raise for the shipwright.[1]

In September, 1820, Captain Matvei Ivanovich Murav'ev assumed the position of Chief Manager of the Russian colonies in America, replacing Hagemeister's successor Semyon Ivanovich Yanovskii, who had managed the colonies from the time of Hagemeister's departure for Russia in November 1818 until Murav'ev's arrival in 1820 (Pierce 1986). In an attempt to improve the durability of the ships built by the company, Murav'ev directed that all future constructions should employ pine for the ship's frames

[1] "Grudinin came to see me in the afternoon. He said that he was planning to stay to build a new ship. He was very dissatisfied with his pay, and said that even with bonuses he had difficulty leading a decent life. If he were paid a better wage, he said, he would not object to staying on a while longer. In my opinion, if the chief manager does not cancel his plans for shipbuilding, a special contract might be concluded with Grudinin for paying him a better wage, in exchange for which he could choose two or three capable men and teach them the rules of shipbuilding, so that he might then be replaced at a later date" (Khlebnikov 1820: 66).

and laurel for the hull planking (Tikhmenev 1888:228), although Bancroft (1886:640) claims the directive was for pine and "cedar (redwood?)".

In addition to bringing a new Chief Manager, the year 1820 also saw the retirement of Kuskov from the company. After three decades of service to the company, he departed California and returned to Russia, where he died in 1823 (Bancroft 1886:642). Karl Schmidt, a merchant seaman of "considerable enterprise and ability" (Bancroft 1886:642; Tikhmenev 1888:224), assumed the responsibilities of manager of the Ross counter and directed the agricultural and industrial enterprises of the colony for the next four years.

On September 15, 1820 the keel was laid for the third company vessel built at the Ross shipyard. Khlebnikov, who had returned from a visit to Monterey, describes the occasion thusly:

> Mr. Kuskov wanted to start building a new ship. He did not want to christen it until a new Chief Manager had been appointed [word of Murav'ev's appointment had apparently not yet reached Ross]. I suggested naming the ship in honor of RAK Director Kramer . . . . Mr. Kuskov agreed to my idea and at 11 o'clock we went to the shipyard, read a prayer, and set to work. An hour later, we raised the company flag on the sternpost of the new ship. We congratulated Mr.Kuskov, drank a glass of wine, and gave each of the workers and Aleuts a cup of rum. The ship is 60 feet long at the keel, and almost all the wood used in its construction was prepared here. (Khlebnikov 1820:86).

Sometime between its christening and its completion in 1822, the vessel was officially named *Volga*, despite Khlebnikov's suggestion. It was a brig of 160 tons under the command of Captain Tumanin and was used heavily, frequently traveling between company headquarters at New Arkhangel and the Ross colony. In 1827, the ship was

declared unseaworthy and in 1828 was sent to the island of Atkha where it was put into use as a storage vessel for lumber (Khlebnikov 1861;117).

In 1823 construction of a fourth company vessel began at the Ross shipyard. Completed in 1824, the 200-ton brig *Kiakhta* was built of fir, with a keel and sternpost of oak (Khlebnikov 1861;117). Launched on August 9, 1824, *Kiakhta* was taken to the port of Rumiantsev the next day where it was fitted-out. Its maiden voyage was to Monterey where it arrived on August twenty-second to the impatient greeting of Khlebnikov, who had been awaiting its arrival for several weeks. Although his notes of 1833 describe the vessel as having a displacement of 200 tons, Khlebnikov records it as being of 120 tons when describing his business transactions with the Spanish in Monterey, falsifying the ship's size to reduce the amount of duty he was to pay.

> Mr. Mariano [Spanish paymaster] took my word on all the items in the count. Under any other circumstances I would not have abused his trust, but here, bearing in mind the duty added for provisions purchased, I had no compunctions about leaving out numerous acquisitions or entering smaller amounts for goods sold. . . . I put the tonnage of the *Kiakhta* at 120 tons and that of the *Buldakov* at 160 tons. The officials argued about those figures for a long time, but finally consented (Khlebnikov 1824: 183).

Subsequent references to the vessel are scarce. It apparently saw limited service along the coast with an occasional trip to the northen outposts and was abandoned after a few years.

With the launching of *Kiakhta*, Khlebnikov's dissatisfaction with the performance of Schmidt as manager of the Ross counter apparently came to a head. In a letter to Chief Manager Murav'ev, Khlebnikov itemized Schmidt's many shortcomings and promised to

replace him. On November 3, 1824, the Chief Manager, through Khlebnikov, appointed Pavel Ivanovich Shelikhov as manager of the Ross colony. It was Shelikov who oversaw the construction of the last two ships to be built at Ross.

Little is known about the two vessels built for the Spanish missions. Nothing in the Russian documentation examined gives any information about them. The Spanish records examined are equally mute, possibly because the trade exemplified in the exchange with the Russians was strictly forbidden.

In one of his numerous written instructions to the new manager of the Ross colony however, Khlebnikov stated "Once you have finished building the ship, you should focus your attention on agricultural matters" (Khlebnikov 1824:191). Since these instructions were written on November 3, 1824 and *Kiakhta* had been launched on August 9, 1824, some three months earlier, it seems that Khlebnikov was referring to a new ship on the ways, most likely the ship that would be sold to the mission at San Francisco in 1826.

The unacceptably short lifespan of the ships built in the Ross shipyard, and the cost and difficulty of building them, led to the closure of the yard in 1827, after the sale of the barge (or barque) to the mission at San Jose.

> Generally speaking, the ships built at the settlement could only be used five years without complete retimbering. The wetness of the wood caused it to rot early. Finally, ships built at the settlement were more expensive than those purchased from the Americans or built in New Arkhangel, because of the large number of men that had to be employed to transport the timber from the remote forests to the shipyard. For this reason the company abandoned shipbuilding at Ross (Tikhmenev 1888:228).

The poor durability of the ships, and the consequent failure of the Ross shipyard to perform as a successful, long-term adjunct to the other economic enterprises of the colony, is commonly attributed in the historic literature to the poor quality of the wood employed in the construction of the ships, and its improper preparation prior to its use (Bancroft 1886:639; Khlebnikov 1861:116; Potechine 1859; Tikhmenev 1863:228). Of these two arguments, the latter may indeed be a component in the explanation for the unacceptable rate of deterioration in the vessels, but the former is almost certainly not. The same northern California forests used by the Russians also provided the timber for several prosperous north coast shipyards of the late 19th and early 20th centuries. For years those yards produced numerous successful, durable ships for use in the west coast lumber trade (McNairn and MacMullen 1945). The improper preparation of the wood, on the other hand, was undoubtedly an element contributory to the short lifespan of the Ross ships. The lack of skill in this area is exemplified in a report Schmidt made to Khlebnikov in October, 1822:

> The wood prepared in the summer of 1821 by Mr. Kuskov for building a ship and which had been left outside northwest of the fort had rotted, and the shipwright said it could no longer be used (Khlebnikov 1822:96).

This gives rise to a question about the quality and the general competency of the workers involved in the ship construction, an issue intrinsic to whether or not the wood was properly treated and by extension, whether or not the ships rotted because they were simply not properly built.

The stringent personnel policies of the RAK created a situation in which the company was constantly short handed and in need of both skilled craftsmen and unskilled laborers. Although considerably more enlightened in the 19th century than they had been earlier, these policies provided scant financial opportunities for the company's work force, so a reliable supply of labor from the east was always problematic.

Despite its comparatively benign climate, the colony at Ross shared the same labor problems as the company's outposts in the north; it too was constantly in need of workers. Workers at Ross were recruited from the force of contract laborers brought into the northern colonies from Russia and Siberia, and from the local native Californians (Okun 1951). Once at Ross, the workers from the north, being virtually bound into perpetual servitude to the company by the terms of their contracts, often deserted for the nearby foreign lands of Spanish California. Their return was frequently an issue in the Russian-Spanish dialogues regarding the legitimacy of the Russian occupation of Ross (Bancroft 1886). In the same way that the Russians stalled in responding to Spanish demands for clarification as to the reasons for their presence in Alta California, so too the Spanish, sharing the same problems of manpower shortages as the Russians, stalled in returning the Russian deserters to Ross (Okun 1951). Workers who were available were driven hard.

> The Russians should be put to work at tasks that are important for the Ross settlement. In accordance with Company regulations, they are to begin work at six in the morning; there is a break between eleven and one, and work finishes at six in the evening. On Sundays and holidays they have the day off. It is important to insure that the men are always busy, because idleness is at the origin of an attitude of vices (Khlebnikov 1824:190).

As a source of labor, the pool of Indian workers soon proved unreliable as well. The low wages paid by the Russians quickly discouraged the Indians from voluntarily reporting for work. The large numbers of workers required to keep the agricultural and industrial ventures functioning necessitated the type of action described by Baron Ferdinand Petrovich Wrangell, Chief Manager of the American colonies from 1830 to 1835:

> . . . when there are few volunteers, then as many Indians as can be assembled - sometimes as many as 150 - are driven together by force and put to hard work in the fields for a period of about a month and a half. . . . the Indians reach in the end a state of complete exhaustion (Okun 1951:143).

By 1822, the shortage of both skilled and unskilled workers was taking its toll on the shipbuilding effort. The optimism evident two years earlier in Khlebnikov's description of the abundance and suitability of the local wood for shipbuilding had evaporated. In October 1822 he wrote of the shipbuilding enterprise:

> It is virtually impossible to continue building ships. The wood needed is very far away and extremely difficult to bring back because there are not enough men available. The wood is cut in a deep ravine and must then be carried onto a road, where it is loaded onto horses that can take only one log at a time. From there it is taken to a better road and transported to the fort, but the distance is such that no more than two trips a day can be made (Khlebnikov 1822:97).

Those laborers who were available to work in the shipyard apparently lacked the requisite skills to properly build a ship. Problems in the construction of *Volga* illustrate this point. "Mr. Schmidt deeply regretted the sudden death last year of the best carpenter, Vasilii Antipin. None of the other men had any shipbuilding skills, except Korenev, who wants to leave, and Permitin" (Khlebnikov 1822:97). The shipwright Grudinin had

apparently heeded the suggestion Khlebnikov made in 1820 and trained two or three men in the rules of shipbuilding but was not directly involved in the construction of the *Volga* in 1822. Khlebnikov advised Schmidt "to do all within his power to build the ship, which might be the last. The shipwright Grudinin agreed to take charge of the ship's construction" (Khlebnikov 1822:97). Who Grudinin used to complete the ship and how it was done are not mentioned in the historic accounts of the enterprise.

The blame for the short lifespans of the ships built at Ross may properly be laid at the feet of the men who built them, rather than in the materials with which they chose to work. In a backhanded compliment to the yard's chief carpenter, Khlebnikov himself indicts Grudinin as an element in the yard's failure:

> One must give credit to the common carpenter who built two ships on Sitkha and later four ships at Fort Ross. But one must also acknowledge the fact that any person boarding these ships for a stormy passage cannot have full confidence in an individual who has no understanding of the art of shipbuilding (Khlebnikov 1861:79).

The problem of obtaining skilled workers to build the ships is also mentioned obliquely by Khlebnikov who, probably in view of his earlier enthusiasm for the enterprise, seems to be reluctant to specifically place any blame for the poor performances of the shipyard's issue. After discussing the cost of paying the wages of thirty workers for the year and one-half required to build a ship, he wrote:

> The consideration that the persons who live in an area must earn their living somehow was the only reason shipbuilding attempts were considered. However, when it was found that California oak soon rots and is quite unsuitable for ship construction, the decision was made to terminate this activity, and people were put to work in agricultural occupations instead (Khlebnikov 1861:80).

As discussed earlier, the only evidence that may be brought to bear on the questions of the skill levels and competence of the shipyard workers is the archaeological evidence that may be extant at the site of the Ross shipyard. The sketchy historic accounts of the yard's operation give little indication as to the construction methods used, but vessels of the size built at Ross surely required fairly substantial shipways. References are made to the structures built to accommodate both the construction activities and the launching of at least one vessel. In referring to *Kiakhta*, Khlebnikov wrote "They have begun building a launching structure and hope to launch the ship in July" (Khlebnikov 1824:156). A month later he wrote "With regard to work on the ship, Mr. Schmidt wrote in two lines that the launching structure was ready, but that there were not enough rafts available" (Khlebnikov 1824:162).

This confirmation that there were specifically-built foundations and frameworks employed in the shipbuilding activity raises the tantalizing possibility that perhaps something of the shipyard still exists beneath the sands of the cove at Fort Ross. These remains may provide some insight into both the quality of the craftsmanship employed in the frontier shipyard and the reason for the yard's ultimate demise.

Chapter 4

Environmental Setting

The northern three-fourths of California is dominated by the Great Central Valley, which is flanked by the mountains of the Sierra Nevada and Cascade Range on the east, the Transverse Ranges on the south and the Coast Ranges and Klamath Mountains on the west (Baumhoff 1978:16). The Coast Ranges are formed of numerous separate ranges that extend in a northwesterly direction along the Pacific Ocean, west of the Great Central Valley, from the Transverse Ranges into Oregon. San Francisco Bay divides the Coast Ranges into their Northern and Southern portions (Moratto 1984:15). The area in which Fort Ross is situated has been designated the Fort Ross Region. It comprises approximately 750 sq. km. of the southern portion of the North Coast Ranges. Its western boundary is a 50 km. stretch of rocky coastline that extends from present day Gualala in the north, to Jenner in the south. Its northern and southern boundaries are formed respectively by the north fork of the Gualala River and the Russian River in the south. The eastern boundary is a line parallel to the coast that passes through the North Coast Ranges, 10-15 km. from the western shoreline (Lightfoot et al. 1991:29).

The Fort Ross Region lies in the coast-redwood ecozone, a narrow, uplifted coastal terrace adjacent to the ocean and separated from the valley-foothill zone by the redwood forests of the Coast Ranges. The narrowness of the coastal terrace between the eroded coastal beachline and the redwood forests restricts both the nature and quantity of edible plants and animals, making the ecozone somewhat unfavorable as a habitat.

Prehistoric subsistence was predicated on obtaining food and raw materials from the ocean, redwood forests, and the rivers and streams that drained the region (Bean and Theodoratus 1978:289).

The dominant features of the region are the coastline, coastal terraces, mountain and ridge systems, and the river drainages (Lightfoot et al. 1991: 29). The coastal area in the Ft Ross Region is considered a protected outer coast, which is characterized by surf zones dissipated by the protection of offshore rocks or coastal headlands (Lightfoot et al. 1991:31).

Cultural Setting

At the time of European contact, the Fort Ross Region was occupied by the Southwestern Pomo, speakers of one of seven distinct and mutually unintelligible languages that 19th century anthropologists grouped together under the rubric Pomo. The seven distinct speech forms were identified geographically by anthropologist Samuel A. Barret in 1908, who named the seven groups according to their position relative to one another: Southwestern Pomo, Southern Pomo, Central Pomo, Northern Pomo, Northeastern Pomo Eastern Pomo, and Southeastern Pomo(McLendon and Oswalt 1978:274). Of the seven groups, only one had a name for themselves; Barret's "Southwestern Pomo" referred to themselves as "Kashaya."

The Kashaya occupied approximately 48 km of today's northwest Sonoma County coast. Their territory encompassed Stewarts Point to the north and Duncans Point to the

south and extended inland approximately 24 km (McLendon and Oswalt 1978:278) (Figure 3). This area comprises two ecozones, the coast-redwood discussed above, and the valley-foothill which lies to the east of the redwood forests of the Coast Range. The combination of these two ecozones provided a diverse and abundant subsistence base, exploitation of which led to two basic settlement patterns. Permanent villages were located inland, away from the coast, and seasonal campsites were situated along the shoreline, near rivers and creeks, and in certain fertile regions of the redwood forests (Bean and Theodoratus 1978:289).

Acorns, buckeye nuts, berries, grass seeds, roots and bulbs supplemented a diet of deer, elk, antelope, rabbits, squirrels, and birds that were hunted in the eastern ecozone. Exploitation of the coastal littoral produced fish, shellfish, snails, kelp, and sea lions. Local rivers and streams produced mussels and fish. At the time of European contact, the larger mammalian food sources were hunted with bow and arrow, spears, and clubs. Small animals and birds were captured with snares, basket traps, bola, and nets. Fish were caught in traps or weirs, and with lines (Bean and Theodoratus 1978:290).

In the coast-redwood zone, temperatures ranged from summer highs of 80°F to well below freezing, with annual rainfall averaging 40-50 inches per year. The coast-redwood zone is subject to morning and late afternoon fog most months of the year. Although somewhat hotter during the summer months, with temperatures reaching mid-day highs of 100°F, the valley-foothill region experienced more temperate extremes, with

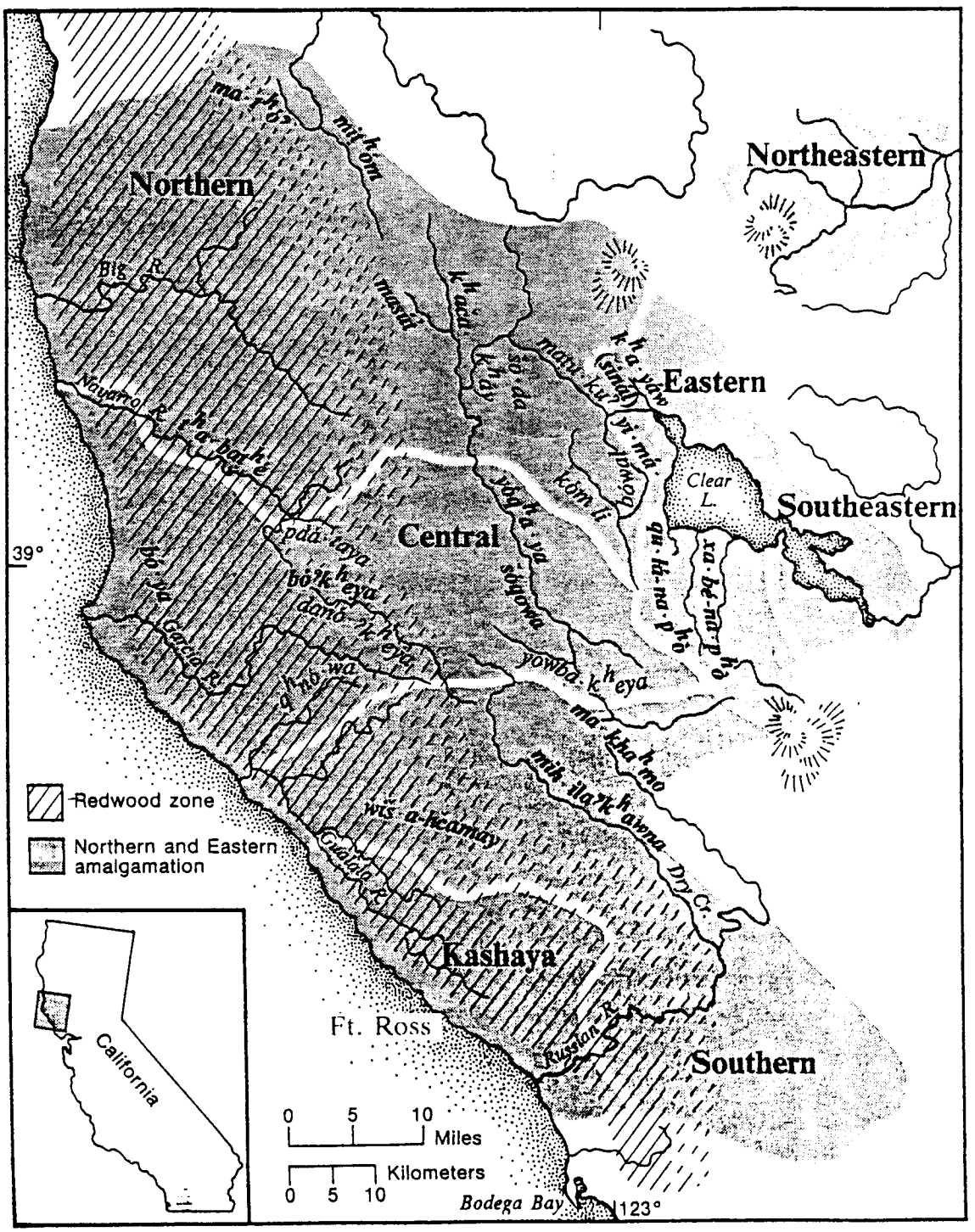


FIGURE 3. Pomo Territories (after Oswalt 1978:276)

winter temperatures averaging 50-60°F. Rainfall in this region averaged approximately 30-40 inches per year (Bean and Theodoratus 1978:289-290).

During the more temperate months, men generally were nude, occasionally wrapping a skin around their hips for ceremonial or specific social purposes. Women in the coast-redwood region were always clothed in double skirts, fabricated from the shredded inner bark of the redwood tree. A mantle woven from the same material occasionally was worn around the neck. It hung down to the waist to meet the skirt (Kroeber 1976:240; Bean and Theodoratus 1978:291).

The Kashaya house form in the coast-redwood region was constructed of slabs of redwood bark, leaned together to form a conical-shaped structure 10-15 ft. in diameter and 6-8 ft. in height. Each sheltered a single family. The Kashaya Pomo occupying the Russian River area tended to favor slightly more elaborate structures fabricated from a framework of poles bent and joined at the top. These were thatched with grass that had been attached to horizontal poles fastened to the framework, then clamped with another course of horizontal poles. These structures were usually round, but sometimes rectangular, and sheltered several families (Kroeber 1976:241). Seasonal campsites on the coast were constructed of simple brush shelters which sufficed in the more temperate summer months.

One of the more remarkable aspects of Pomo culture was the fact that the shore-dwelling Pomo, Kashaya in particular, who derived much of their sustenance from the water, never developed a boat technology. With the abundant redwood forest as a raw

material resource, and the reliance on both the river drainages and coastal littoral for food supply, the Kashaya simply chose not to pursue this technology.

> . . . it is certain that the art of canoe building would have spread . . . to the Pomo. . . . The characteristic thing is that with this knowledge, they [the Pomo] and their neighbors chose to do without (Kroeber 1976:244).

The Pomo did excel in two crafts that distinguished them from other native Californian groups: basketry and the manufacture of money. The manufacture and use of pottery in California's aboriginal cultures was rare and limited to some of the cultural groups that occupied Southern California. In lieu of pottery, woven and twined baskets were used throughout California for storage, cooking, and carrying. The baskets of the Pomo people, from flat plates to almost-perfect spheres, are considered to have been the finest made in California, if not the world (Bean and Theodoratus 1978:291; Kroeber 1976:244). The Pomo were also the principal purveyors of money in central California. Manufacturing fine, disc beads from clam shell and long, cylindrical beads from magnesite were specialties of the Pomo, who used the highly-prized beads as currency throughout their trading region (Kroeber 1976:249).

Historical Setting

Into this balanced, harmonious ecology came the impact of European expansion and exploration, possibly as early as 1579. In that year, Sir Francis Drake careened the *Golden Hinde* at Point Reyes, the territory of the Pomo's southern neighbors, the Coast Miwok.

With the perceived threat of a British presence in Alta California and Russia's expansion from Siberia into the Pacific Northwest, Spain began to expand its dominion over the lands it claimed. During the 200 year period following Drake's landing, Spain attempted to establish hegemony over the region in the specific form of the California missions. In 1776, Spanish colonization reached San Francisco Bay with the founding of Mission San Francisco de Asis (Mission Dolores). European trade goods began finding their way into Pomo culture at the same time the Spanish began raiding the territory for potential converts to Christianity. Spanish cultural traits were carried from the missions back to the aboriginal populations by fugitives from the oppressive Spanish system (Forbes 1969).

Unlike the other native Californians, the Kashaya's first direct contact with Europeans was probably not with the Spanish, but with the Russians. As discussed in Chapter 2, Ivan Kuskov purchased the property on which the Ross counter was constructed from the leaders of the Kashaya Pomo in 1811. This arrangement offered the Kashaya protection from Spanish oppression and, with the relative freedom from forced acculturation offered by the Russians, served to somewhat insulate the Kashaya from the decimation that occurred with almost all other aboriginal cultures touched by Spanish missionization (McLendon and Oswalt 1978:277). The differing purposes for which the Spanish and Russian settlements were established helps explain the striking contrasts between their respective impacts on Indian culture. The Spanish established a relationship wherein the Indians were wholly dependent on them, leading to cultural destruction and

ultimately, depopulation. The Russians, in comparison, established a relationship of mutual interaction in which both sides benefited and which apparently did not significantly impact Kashaya culture (Chartkoff and Chartkoff 1984:310)

The period of Russian occupation of the Fort Ross region lasted from 1812 until 1841 when the Russian American Company sold its property and equipment at the Ross settlement, Port Rumiantsev (Bodega), and its ranchos in the Russian River valley to John Sutter for the equivalent of $30,000 (O'Brien 1980). Sutter, a Swiss rancher who had become a Mexican citizen, had extensive holdings in the Sacramento River, principal of which was the settlement called New Helvetia.[1] He purchased the Russian-American Company's California holdings to improve his properties in the Sacramento Valley, signing a contract that called for payments over four years. The first three years' payments were to be in "produce of the land", equivalent to $5000 in each of the first two years, and $10,000 in the third. The fourth year's $10,000 payment was to be in cash (Dmytryshyn 1989:441). It is not clear if Sutter ever delivered the produce, but he apparently never paid his debt. "This [conversation] was the result of the failure of the Company to collect a single penny from Mr. Sutter, . . . who had purchased the property of Ross" (Okun 1951:151).

After the sale, Sutter appointed John Bidwell, an employee at New Helvetia, to direct the transfer of his newly-acquired properties from Ross to New Helvetia, a process that would take two years. Equipment, furniture, and fixtures were moved by ship and

[1] Sutter also owned the sawmill on the American River where, in 1848, his employee James Marshall would find the gold that precipitated the California Gold Rush.

barge south along the coast, through San Francisco Bay, San Pablo Bay, and the Sacramento-San Joaquin River Delta system, and then up the Sacramento River to Sutter's settlement. Livestock acquired in the purchase were driven overland. With the completion of the move in 1843, Sutter appointed William O. Benitz as manager of the Ross properties. Benitz quickly became embroiled in a dispute between Sutter and the Mexican government, which refused to acknowledge Sutter's title. Neither Spain nor Mexico had ever recognized Russian ownership of the property, so the Russian sale to Sutter was considered invalid (O'Brien 1980). Instead, Mexico awarded the property to Manuel Torres in a Mexican land grant. Benitz battled the grant for nearly three years on Sutter's behalf and finally left his employ in 1846 to enter into a partnership with Ernest Rufus. Benitz and Rufus then purchased the Ross properties and the surrounding lands that comprised the land grant from Torres.

Benitz operated the property for the next twenty years, developing cattle, sheep, and horse ranching, and the production of wheat, oats, produce, coal, and a large fruit orchard (O'Brien 1980). The boom of the California Gold Rush provided a ready, healthy market for the output of the Benitz-Rufus enterprise, but by 1867 business had started to taper. Consequently, the property was sold to Charles S. Fairfax and John Dixon, who developed a substantial lumber industry at the site. At the north cove of the Ross complex, the two entrepreneurs built a sawmill and a lumber chute to load ships that would carry their finished products to San Francisco. The business was extremely

successful and Fort Ross became one of the famous "doghole ports" of the northern California coast (Sullenberger 1980).

With Fairfax's death in 1873, the property was purchased by George W. Call. Call was another keen and enterprising businessman. He increased trade by sea by building an impressive wharf and warehouse at the Fort's north cove, and established a weekly coastal service to San Francisco. Ranching activities continued under Call's ownership and shipments of the Ross ranch's output, as well as that of neighboring ranches, to San Francisco soon made Fort Ross one of the most active business and shipping centers on the west coast (O'Brien 1980).

Within the stockade of the old Russian fort, many changes had occurred over the years. The Official's Barracks had been converted to a saloon and the Commandant's House, built for Alexander Rotchev, the last manager of the Ross counter, served as the Call residence until 1878 when it was converted into a hotel.

In addition to serving as the commercial center of the northern California coast, Fort Ross also became the social center of the region, with festive balls and parties held in the Russian fur barn, which had been converted into a ballroom. The frequent social festivities drew friends and neighbors from surrounding ranches who traveled to the fort and often camped and picnicked on the sandy beach of the fort's southern cove.

In 1903, the stockade and a portion of the surrounding lands were purchased from the Call family by the newly-formed California Historical Landmarks League. The property was then deeded to the people of California. Under the direction of the

California Department of Parks and Recreation, the fort has been restored to its Russian-era configuration and today Fort Ross State Historic Park is one of the "jewels" of the California park system.

Chapter 5

Previous Archaeological Research

Prior to the advent of federal and state laws that promulgated the concept of cultural resource management, little in the way of research was conducted on historic-era archaeological sites in California (Chartkoff and Chartkoff 1984). The earliest archaeological research conducted in the immediate vicinity of Fort Ross was that of Omer Stewert in the 1930s, whose reconnaissance survey located several sites (Lightfoot 1991:60).

In 1935, Stewert recorded CA-SON-174, a "large 'sweathouse' pit . . . in pasture between State highway #1 and sea cliff" (Stewert 1935a). Stewert's rather sketchy site record simply describes the location of the depression. This site was re-recorded in 1989 by archaeologists from U.C. Berkeley. The U.C. Berkeley supplement to the site record describes three depressions and two discrete midden areas (Kim, et al. 1989). After analyzing the artifactual materials recovered from the site, Lightfoot (1991) suggests the major occupation of the site occurred after the Russian period at Fort Ross. Kashaya Pomo appeared to have lived at the site during the period they were employed as agricultural laborers for William Benitz. The site was subsequently reused when a schoolhouse was erected on it in the late 19th century.

In 1935 Stewert also recorded CA-SON-175 in the vicinity of Fort Ross. It was re-recorded in 1949 by Arnold Pilling and Clement Meighan. In his description of the site, Stewert simply recorded a "large pit; shell" (Stewert 1935b). In an earlier ethnographic

survey, Barrett identified the location as the site of the historic Pomo village called "Metini" (Barrett 1908:230-231). He described the large depression recorded by Stewert as a "dance- house," that was surrounded by several other, smaller "house pits." The smaller pits were "plowed out" during the ranching era (Pilling and Meighan 1949).

The location of the Ross stockade was not recorded until 1950, when Pilling (1950) filed an Archaeological Site Record for CA-SON-190/H. For a number of years thereafter, the focus of archaeological work at Fort Ross was directed at defining the compound's structure and the historic placement of installations within it (Chartkoff and Chartkoff 1984:310). Through archaeological investigation, Adan Treganza of San Francisco State University was able to demonstrate that the reconstructed walls of the chapel were nearly a foot away from their original location and, more importantly, that the Aleuts and Pomo who resided at the Ross counter never lived within the walls of the compound (Chartkoff 1984; Treganza 1954).

In 1977, Stillinger (1977) recorded a prehistoric archaeological site near Fort Ross on the basis of information developed in 1970 excavations conducted by Sonoma State University (Stillinger 1975). The site, CA-SON-670, is the present location of a small, group campground, primarily used by archaeologists and archaeological field schools conducting research at Fort Ross. On the basis of artifact analysis, Stillinger (1975) suggests the site reflects three distinct occupational episodes. The oldest dates to pre-European contact, the next to a period of Native Californian occupation during the Historic period, and the last to a period in the 1870s when the site was used as a logging

camp. A second prehistoric component of the site was recorded in 1988 by U.C. Berkeley's Fort Ross Archaeological Project (Dobres 1988a).

CA-SON-1451 is a small lithic flake scatter recorded by Parkman in 1984. It is located on the road to the group campground adjacent to SON-670 and may be a portion of a larger site. Surrounding vegetation was such that surface visibility was impaired at the time the site was recorded, making a more thorough evaluation impossible. Chert flakes and an *Olivella* shell were recovered from the site.

Remnants of the 19th century lumber loading and storage facility on the bluff above the north cove at Fort Ross were recorded by Schulz et al. (1984), who documented site CA-SON-1454/H on the marine terrace on the eastern side of the cove. Eye bolts, chains, anchor pins, and fragments of redwood lumber were observed, as were four prehistoric cupule petroglyphs, indicating the historic site overlay a prehistoric occupation (Schulz et al. 1984).

On March 17, 1908, the steel-hulled coastal steamer *Pomona* struck a submerged rock off Fort Ross and began taking on water. In an effort to save his ship, the Captain steamed directly for Fort Ross Cove, hoping to beach the ship before it sank. The *Pomona* struck another submerged rock within the cove and stuck fast. The ship was ultimately dynamited to dislodge it from the rock and its remains lie on the bottom of the cove. The scattered remains of the *Pomona* were recorded by Hunter et al. (1988) and have been designated as archaeological site number CA-SON-1704/H.

In the months of June, 1988 and June 1989, archaeologists from U.C. Berkeley's Fort Ross Archaeological Project recorded seven sites within the immediate area of the Fort Ross State Historic Park. These include CA-SON-1878, a prehistoric house pit with a small quantity of prehistoric cultural material (Dobres 1988b), SON-1880, a lithic scatter intermixed with some glass and ceramic (Hays and Robdins 1988), SON-1881, a small shell midden on a tributary of Ft. Ross Creek (Staubach-Summa and Schiff 1988), SON-1886/H, a midden with mixtures of historic bottles and ceramics (Boyce and Dolan 1989), and SON-1891/H, a wooden platform located north of the stockade (Bonilla and Wake 1989). The largest and most significant sites recorded during the 1988 and 1989 surveys were SON-1897/H (Lightfoot 1989) and SON-1898/H (Lightfoot and Schiff 1989). The former is a 2800 m^2 multi-component site containing cultural material from the prehistoric, protohistoric, and historic periods. A lithic scatter and midden deposit underlie a series of 14 pit depressions on the marine terrace south of the stockade. The depressions are associated with the Koniag living structures of the Russian-era and several historic-era, post-Russian commercial structures. The site is the location of the native Alaskan Village neighborhood and was the area examined in U.C. Berkeley's archaeological field schools of 1989, 1991, and 1992.

SON-1898/H is a midden lying at the base of the sea cliff adjacent to the marine terrace containing SON-1897/H. Native Californian, Native Alaskan, and Russian cultural material is present in the midden, as is one *in situ* feature that appears to have been one of

the bath houses documented in the historic literature. The site was excavated by the U.C. Berkeley field school of 1990.

As discussed above, there are a number of archaeological sites in the immediate area of the historic Ross compound. In addition, there are many more sites in the surrounding environs that both predate and are coeval with the Russian occupation. However, none of the recorded sites are directly associated with the Ross shipyard and none of the archaeological research conducted to date has addressed the nature of the industrial effort that took place in the cove during the Russian shipbuilding era. The only feature to be identified in the immediate area of the cove is that suggested to be a bathhouse in the location of SON-1898/H, which had little if any connection with the shipbuilding enterprise. The dearth of information about the Ross shipyard, and the lack of archaeological research on the subject, raises the expectation that significant insights into the Russian American Company's industrial and shipbuilding industries can be recovered through a rigorous application of archaeological methods and a reflexive examination of the historical record.

Chapter 6

Remote Sensing Surveys: Methodology and Results

It appears that no substantive evidence of the ships built in the Ross yard still survives. Consequently, answers to questions about the quality of their construction, the nature of their design, and the care and skill with which their timbers were seasoned and fashioned may only lie in the archaeological record of the yard in which the ships were built. If such evidence can be located, it may be brought to bear on a number of specific inquiries. Among these are questions regarding the placement and configuration of the shipyard facilities, the design of the vessels, as reflected in their shipways, and the level of craftsmanship employed in their construction. Archaeological data may also provide information about modifications made to 19th century shipbuilding techniques in the technologically unsophisticated frontier environment extant at the Ross colony. Evidence of the shipyard facilities at Ross may be used in a comparison with similar data from the Russian-American Company shipyards at Sitka and Kodiak. Finally, the archaeological evidence of the Ross shipyard may provide insight into the social interactions of the multiethnic workforce of Russian aristocrat, Russian peasant, native Alaskan, and native Californian that comprised the yard's construction crews.

To address these questions, a three-phase archaeological survey and testing program was developed to locate, identify, and assess the remains of the Ross shipyard. The study area is the historically known location of the shipyard, a small cove south of and below the Ross stockade in the Fort Ross State Historic Park, Sonoma County, California.

For surveying purposes, the cove was subdivided into three spatially-distinct regions: the nearshore waters of the cove, designated Area 1, the cove's beach , designated Area 2, and the inland area of the cove, separated from the beach by the channel of Fort Ross Creek, was designated as Area 3 (Figure 4).

The first phase of the research program consisted of remote sensing surveys of the three areas, using proton precession magnetometers. The objective of the phase 1 surveys was to locate magnetic anomalies indicative of the presence of subsurface cultural materials. Careful analysis of the signatures of such magnetic anomalies can, among other things, point to the presence of ferrous materials, such as iron fasteners, anchors, chain, cannon, etc. The presence of cultural materials that have been altered by high temperatures, such as fire-cracked rock, kilns, forges, etc., are also detectable through their anomalous magnetic signatures. Both ferrous and heat-altered materials would have been present in a 19th century shipyard.

In phase 2 of the shipyard project, the magnetic anomalies exhibiting signatures characteristic of such cultural materials were tested. Phase 3, yet to be conducted, is a controlled, archaeological excavation of the tested anomalies that produced positive indication of the presence of shipyard remains.

Phase 1 of the shipyard project was conducted in three separate field sessions that began in August 1990 and concluded in October 1992. Phase 2 testing of the anomalies commenced in July 1991 and occurred intermittently during the latter portions of phase 1.

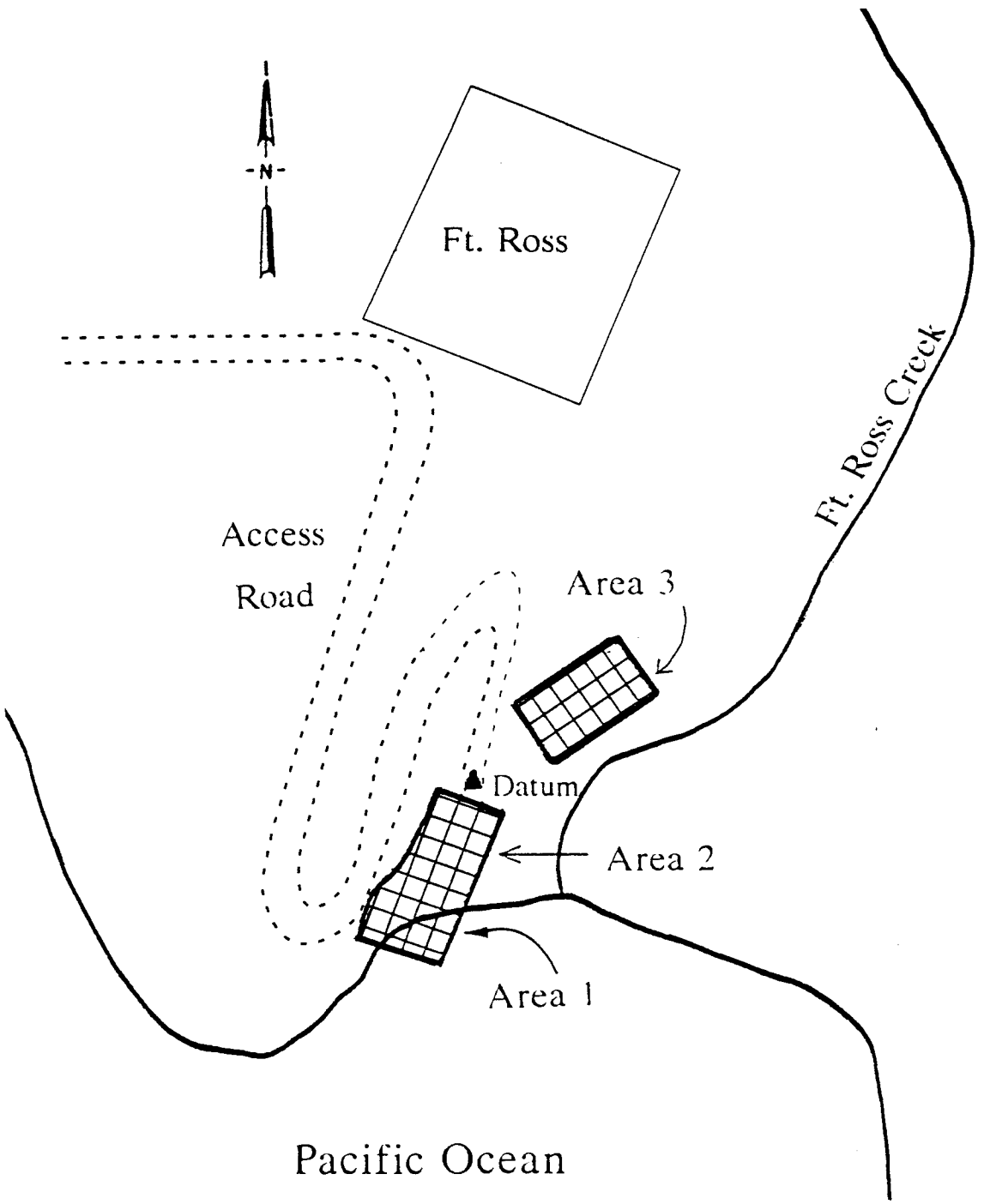


FIGURE 4. Survey Areas in Ft. Ross Cove

1990 Field Season

A permit to conduct a remote sensing survey and limited subsurface testing was issued by the California Department of Parks and Recreation on July 11, 1990. Field work began on August 18, 1990 with the establishment of a grid system over the areas designated as Areas 1 and 2. When completed, the grid formed a rectangle 300 ft. long and 180 ft. wide at its broadest extent, one side of which was an irregular line formed by the base of the sea cliff. The steep slope of the coastal terrace defined the rectangle's western side. The cove's shallow waters formed its southern boundary, while the northern and eastern edges were subjectively drawn to cover the area considered most likely to have been the location of the shipyard (Figure 5). A detailed map of the Ross colony prepared by Ilia G. Voznesenskii in 1817 was consulted in defining the search area since it depicts, among other things, the brig *Rumiantsev* under construction in the Ross shipyard (Figure 6).[1] The areal extent of the survey grid was determined by estimating the approximate size of the structure necessary to build and launch a ship of the size built at Ross. As noted in Chapter Three, the largest of the vessels built in the Ross yard were of 200 tons displacement. Although it is impossible to ascertain from that rating the exact length and breadth of the vessels, an extrapolation of the relationship between displacement tonnage and vessel draft gives an approximate draft of three feet (Desmond 1919:28). Application of a typical ratio of length, breadth, and depth for a vessel of three

[1] The California Department of Parks and Recreation evaluated the accuracy of this map by projecting a photographic slide transparency of it onto a contemporary USGS topographic map of the Fort Ross cove. Voznesenskii's contours of the coastline and the cove were near identical matches to those depicted in the USGS map.

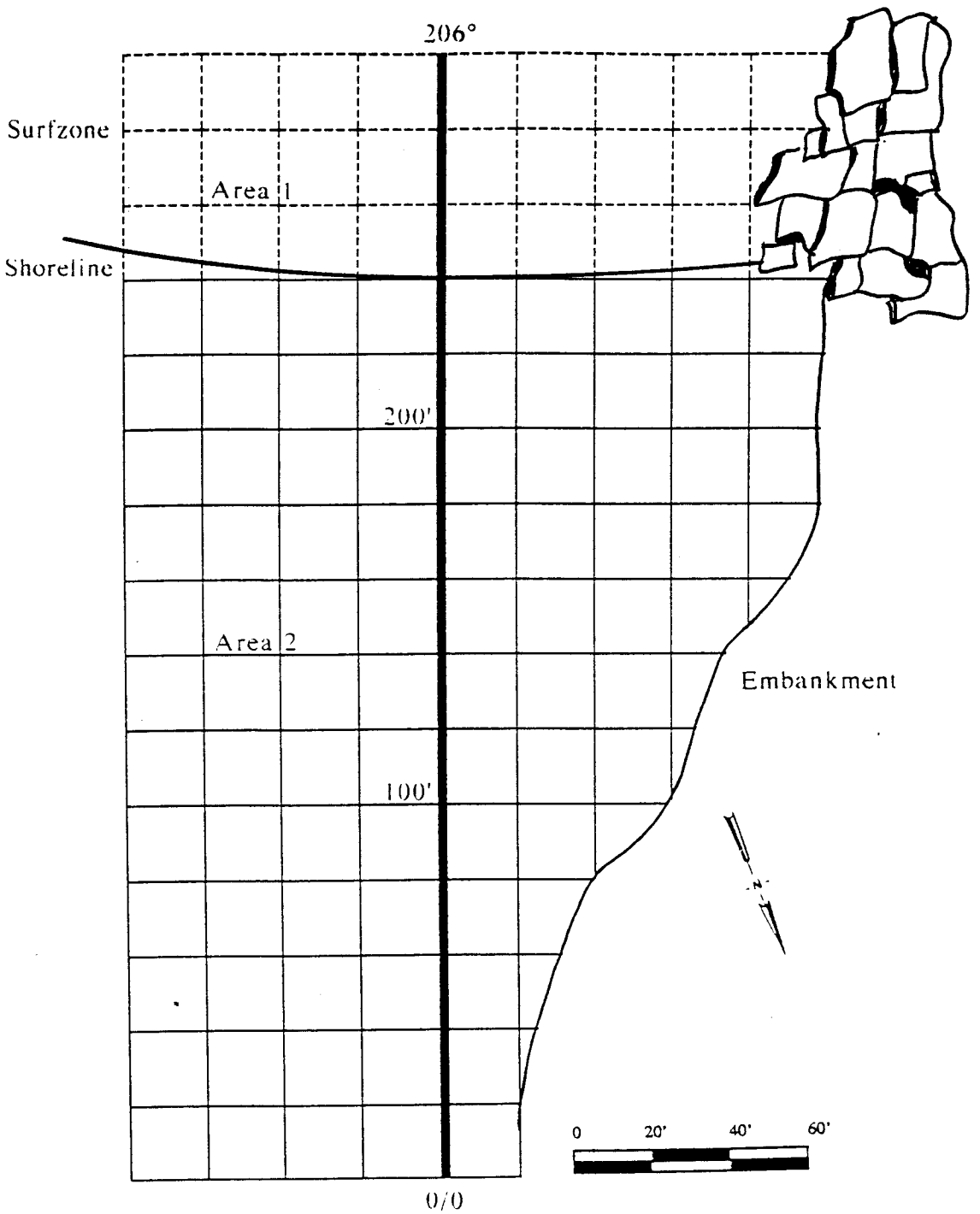


FIGURE 5. Survey Grid Areas 1 & 2

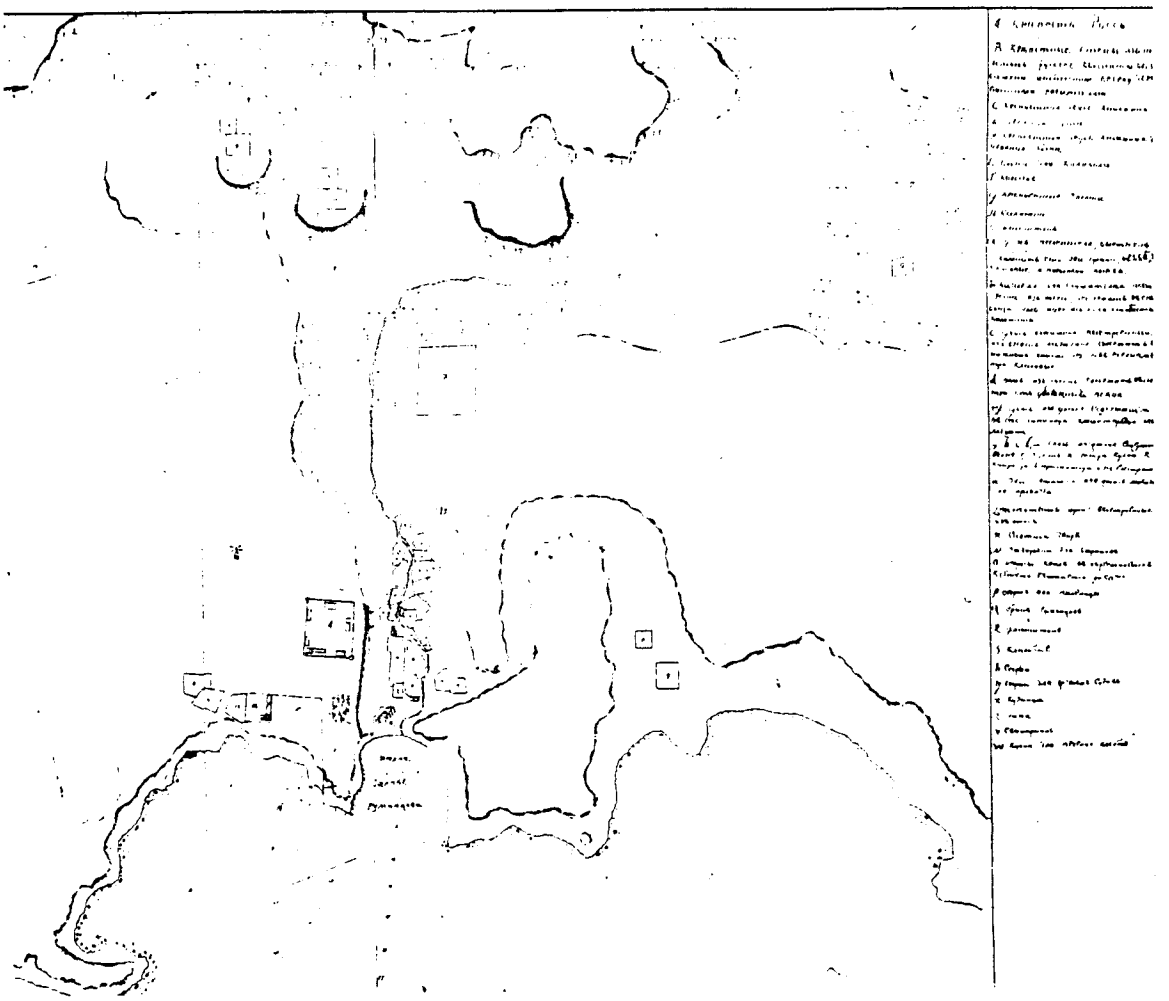


FIGURE 6. Voznesenskii's 1817 Map (from O'Brien 1980:14)

foot draft produces a vessel of between 80 and 100 feet in length, and 18 to 24 feet in width.

In determining the areal extent of the survey grid, project researchers evaluated two important considerations that are weighed when the construction of a ship is being planned. One concerns the foundation on which the ship is built, the building slip, which must be solid enough to support the weight of the finished vessel. The other concerns the inclination of the timbers that will carry the vessel down the slip and into the water, the launching or slip ways. In the shipyards of the late 19th century, these considerations were addressed during the construction of the building and launching structures. To build the slip and properly incline the launching ways, wood piles were driven into the ground in rows, after which their tops were cut off at a height sufficient to insure the proper angle of inclination to the water's edge. Capping timbers were then fastened across the piles, perpendicular to the direction of launch, to form a stage on which were mounted the keel blocks, launching ways and the support structure, or stocks, used during construction (Figure 7). Specifications for shipyards of the period stated that the piles were to be spaced a minimum of 30 in. apart to prevent breaking of the ground. Typically, two to four rows of piles were driven in the area that would support the ship's keel, and two to four rows were used on each side to support the launching ways. The length of that portion of the building slip that lay above the high-water mark was to be half again as long as the largest ship built on it. The position of the slip relative to the water's edge was

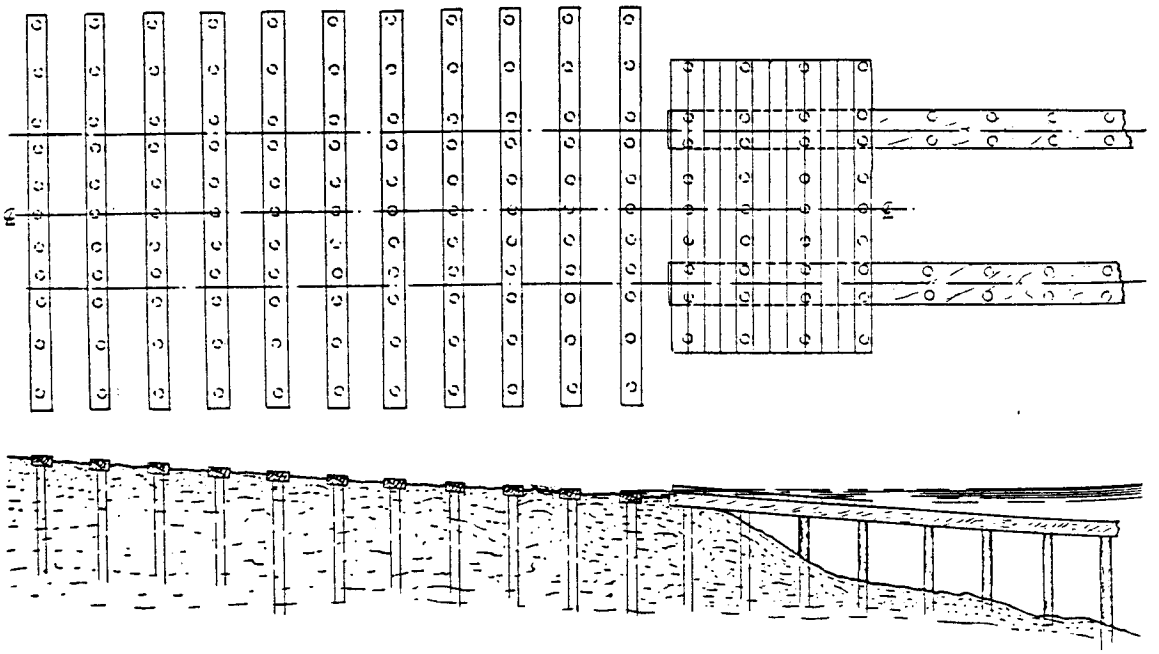


FIGURE 7. Typical slip & launching way (Desmond 1919:66)

determined after considering the distance between a finished vessel's sternpost and the high water mark. This distance had to be great enough to produce a velocity in the launched ship sufficient to overcome the loss of momentum created when the stern entered the water (Desmond 1919:70). The building slip was to be wide enough to accommodate the widest ship to be built, with additional space provided for staging the stocks (Desmond 1919:69).

Although these suggestions and specifications date to procedures used in the latter part of the 19th century, they provide insight into the methods and issues involved in planning the construction of any ship, regardless of the period. It is an underlying assumption of this project's survey strategy that the principles of construction described above will be reflected to some degree in the shipyard remains at Fort Ross. Assuming that the shipyard was built in a similar fashion, the building slip for vessels the size of those built at Ross could have been between 120 and 150 feet in length, and 30 to 40 feet in width. The water end of the launching ways would have extended into the cove's surf zone to a point below the low-water mark.

After determining the areas most likely to contain the location of the shipyard, construction of the survey grid began. A site datum was established at the foot of an access road that opened onto the cove's beach and provided an overview of the study area (see Figure 4). A theodolite was positioned on the datum and corrected for magnetic declination.[2] Using a stadia rod, surveyors established a 240 ft. baseline at a bearing of

[2] All compass bearings referenced hereafter were corrected for magnetic variation. Directions are based on true North.

206°. The baseline extended across the beach (Area 2) and ended at the water's edge. When the endpoints of the baseline were established, the theodolite was repositioned at a point 20 ft. down the baseline from the datum. That point was staked, and from it a line was surveyed perpendicular to the baseline. This procedure was repeated in 20 ft. increments along the length of the baseline, until the low water mark was reached. Each of the perpendicular lines extended a distance of 80 ft. on the east side of the baseline, while on the west side the lines varied in length from 20 ft. to 100 ft, depending on where they intersected the base of the sea cliff. Along the length of each perpendicular line, a stake was placed at 20 ft. intervals, thus creating a grid of 20 ft. squares (see Figure 5).

The phase 1 remote-sensing survey of Areas 1 and 2 was conducted in two segments. One segment was the marine survey of Area 1 (the surf zone and near-shore waters of the cove), while the other segment was the terrestrial magnetometer survey of Area 2 (the beach). The Program in Maritime History and Nautical Archaeology at East Carolina University, Greenville, NC provided a proton precession magnetometer that was used in both segments. For the sake of convenience, the terrestrial survey of Area 2 was conducted first.

The weight of the magnetometer and the two 12 volt batteries required to power it severely compromised its portability. This, and the areal extent of the survey area, required that the magnetometer and batteries be placed in a conveyance that would provide convenient positioning in various locations around the grid of Area 2. A wheelbarrow was kindly provided for this purpose by park personnel. Care was taken

during the survey to insure that the wheelbarrow was far enough away from the magnetometer's sensor to preclude any magnetic interference from its metal tub.

During the survey, a project volunteer carried the sensor head to the corners and the center of each 20 ft. square. The magnetic field at each location was manually recorded after the magnetometer's readings stabilized. The sensor head was held at the same height above the ground and was carefully oriented in the same direction at each reading to negate any heading effects. The process of reading each square's corners insured that each corner received multiple readings. This served to average the distortions that occurred in individual readings.

After the survey of Area 2 was completed, the shallow waters of the Area 1 surf zone were surveyed. In the absence of a more sophisticated positioning system, the theodolite was used to control the location of the sensor along an imaginary extension of the staked grid system. The theodolite was positioned on the baseline while a volunteer, wearing a drysuit, followed the visual extension of the baseline into the surf zone. Holding the sensor in one hand and a ranging line in the other, the volunteer was observed through the theodolite and directed along the bearing of the baseline. The ranging line had been marked in 20 ft. increments and was attached to the baseline's last beach stake. Distance into the surf zone from the last stake was controlled by the ranging line. At each 20 ft interval along the baseline's extension, as determined by the ranging line, the sensor head was lowered into the water and held at a uniform height above the bottom until a reading of the magnetic field was recorded. The survey continued down the baseline's

extension until the water level became too deep to stand. The theodolite was then moved to a transect parallel to the baseline where it and the ranging line were used in a similar fashion, thereby extending that transect's length into the surf zone. This procedure was repeated for each transect parallel to the baseline, thus extending the grid system into the water's of the cove.

Although this method precluded the possibility that each "square's" corners would be read more than once, the readings taken underwater at each 20 ft interval were far more uniform than those taken on the beach. Consequently, unlike the terrestrial readings taken in Area 2, it was not necessary to average-out any distortions in the data.

The survey of Area 1 beyond the surf zone was conducted from a 16 ft. Zodiac dive boat. The magnetometer was placed in the boat with the sensor head deployed over the stern at uniform distances from the boat and above the bottom. Horizontal positioning for the survey was controlled from two theodolite stations that were established on the beach and related to the grid system. Unlike the survey of the surf zone which paralleled the baseline, the survey of the near-shore waters paralleled the shoreline, along the northwest-southeast gridline (Figure 8). As in the survey of the surf zone, a ranging line marked in 20 ft. increments was used to control the transect intervals. One end of the ranging line was secured to the boat, while the other end was held by a volunteer who walked along the last northwest-southeast gridline staked on the beach. The boat maintained a course that kept the line taut during each transect, surveying a line that paralleled the last gridline on the beach. Three survey lines were run in alternating

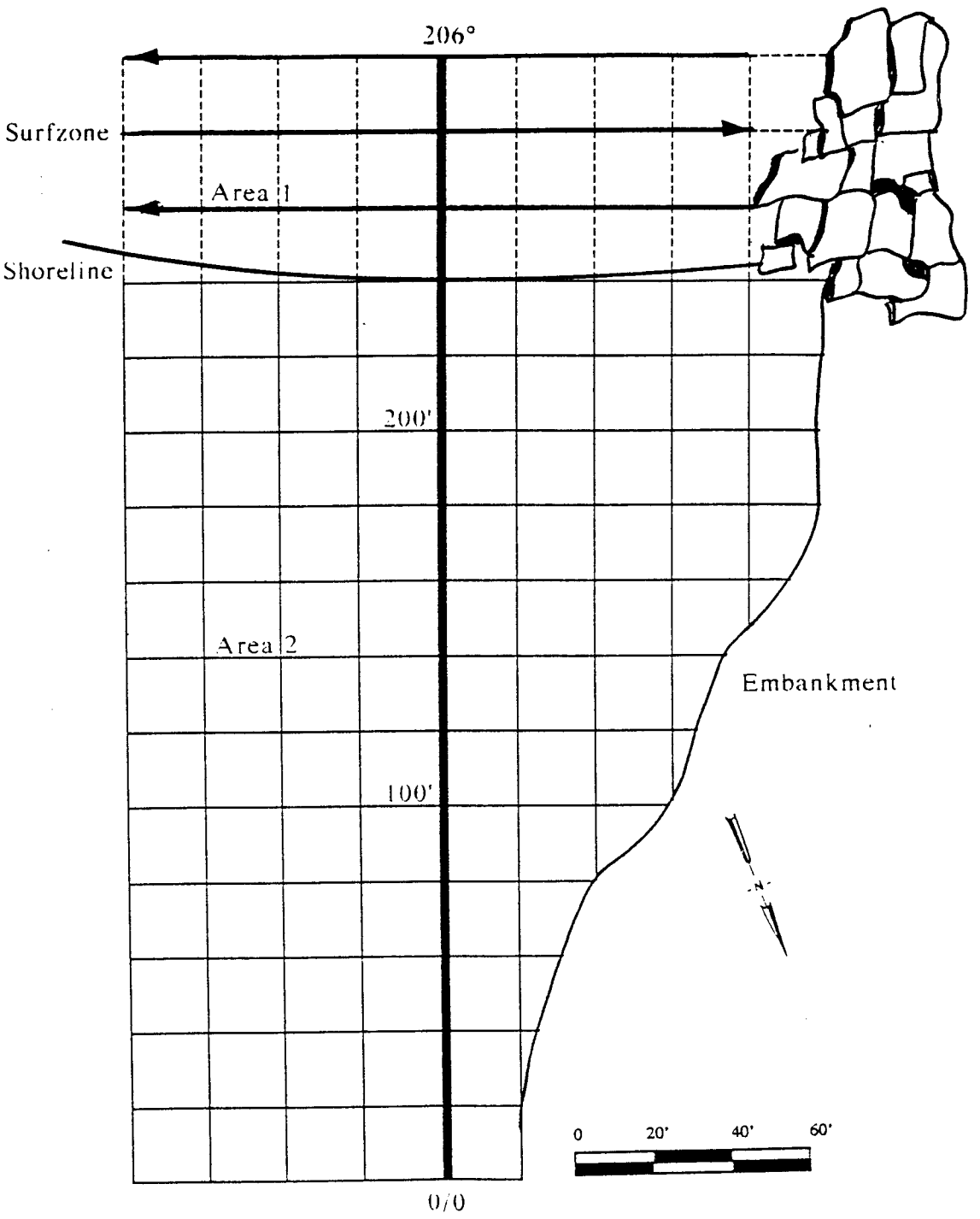


FIGURE 8. Survey Transects, Area 1

directions. At the end of each surveyed transect, an additional 20 ft. increment was released from the ranging line while the boat moved offshore the same distance, maintaining the tautness of the line. In conjunction with the methodology employed in the survey of the surf zone, this approach effectively extended the grid system 60 ft. into the waters of the cove.

At the moment the sensor took a reading during each traverse across the mouth of the cove, a "mark" was radioed from the boat to the surveyors on the beach, who were following the boat through their theodolite's scope. The azimuth from the theodolites to the boat was recorded at each radioed "mark". During post-survey data processing, the azimuths were used to triangulate the boat's location at each marked position. The location of the boat, and the offset of the sensor head, were then correlated with the magnetic data collected at each marked position.

At the conclusion of the magnetometer survey of Areas 1 and 2, attention was turned to an 1866 photograph of the Ross stockade and cove area (Figure 9). Prominent in the photo are a large, dilapidated barn and a corral, both situated on the beach below the stockade. The Voznesenskii map of 1817 shows a building labeled "barn" and a corral in the proximity of this location. A description of the Ross colony published in the 1879 *History of Sonoma County* includes mention of a building in the cove, the rear half of which was used by the Russians "for the purposes of tanning leather" and the front half of which "was used as a workshop for the construction of ships" (Munro-Fraser 1880:367). Because of the apparent proximity of the building to Area 2, it was necessary to determine

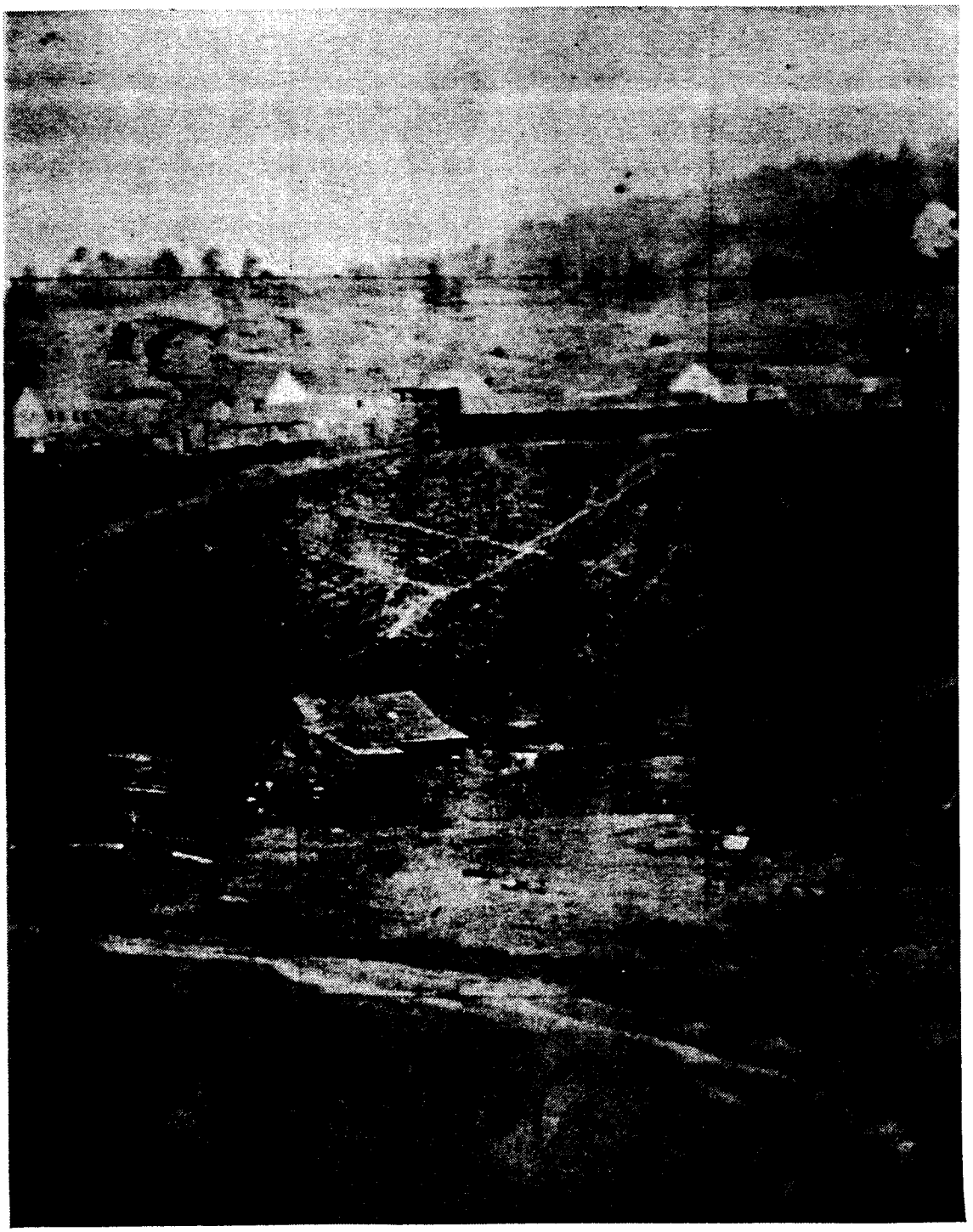


FIGURE 9. 1866 Photo of Ft. Ross Cove

its exact location in order to account for any effects its subsurface remains might have introduced to the data collected during the survey. Identification of the barn's location would also provided an opportunity for archaeological testing of the its subsurface remains to determine whether or not it had been associated with the shipbuilding enterprise.

Using a technique developed by Prince (1988), a photographic transparency of the historic photo was placed on the focusing screen of an Olympus 35 mm camera equipped with a 70mm-210mm zoom lens. A view through the camera lens then produced a view through the transparency. The position from which the 1866 photograph had been taken was relocated and the camera with the transparency was placed on a tripod. With the variable focal length provided by the zoom lens, a view through the camera superimposed the 1866 view of the stockade onto the modern landscape. By aligning the stockade's existing blockhouse corners and chapel spire with the same features in the historic photograph, the image of the barn was imposed on its former location. Through the use of hand-held radios, volunteers who were on the beach and observed through the camera were directed to place pin flags at the barn's corners as depicted in the photograph, as well as the position of the barn's main door. The corners and alignment of the large corral behind the barn were also marked.

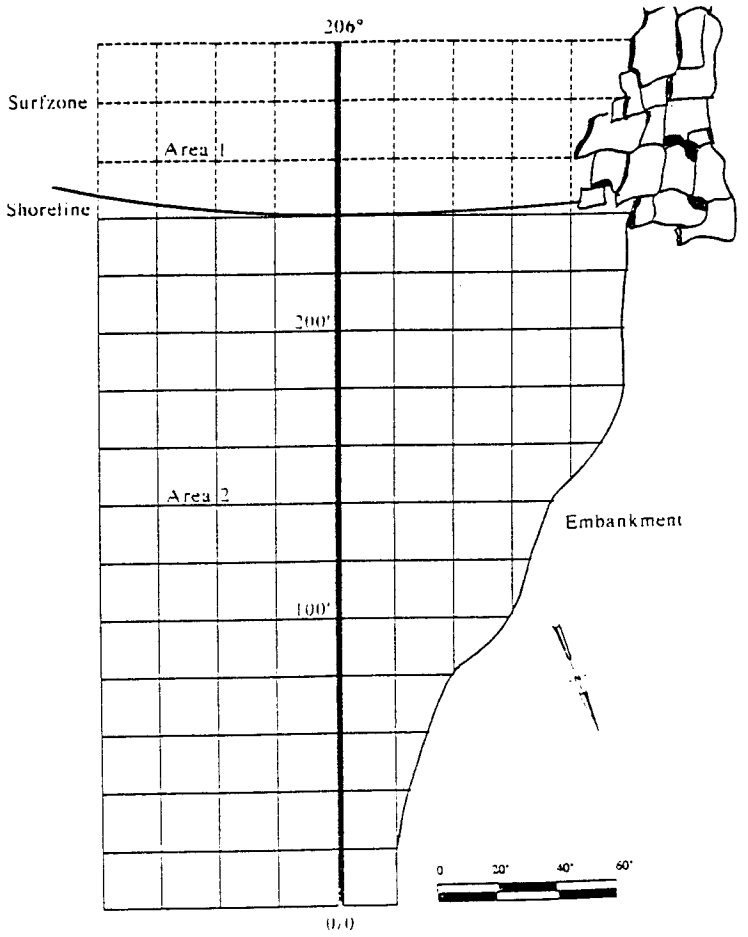
Because the photographic image of the stockade and the barn had been captured obliquely, only three of the barn's corners were visible in the photograph, and its face was angled to the plane of the film. Consequently, the placement of the pin flags produced a

somewhat lopsided plan of the structure. Fortunately, a second photograph of the barn was located in the Fort Ross archives. Although it was undated, it had apparently been taken at a later date than the first photograph, since both the barn and the fort were in considerably advanced states of deterioration. The second photograph had been taken from ground level and depicted a frontal view of the barn, with a portion of the stockade visible on the terrace above (Figure 10). After locating the position from which the photo had been taken, the same procedures discussed above were followed and the actual width of the barn was measured. Since the fourth corner of the barn was visible in the photograph, the plan of the structure was brought into square from its previously lopsided arrangement. The corrected locations of the pin flags marking the barn and corral corners were surveyed from the site datum, and the barn's position was mapped relative to the datum and to the boundaries of Area 2 (Figure 11).

Post-survey processing of the data acquired in the magnetometer survey consisted of manually entering into a computer the coordinates and value of the magnetic field for each data point recorded during the surveys of Areas 1 and 2. Data was entered into Golden Software's Surfer (version 4.0) contouring program, which was used to generate a contour map of the survey area's magnetic field (Figure 12).

The results of the survey as depicted in the contour map were somewhat disappointing, but not unexpected in view of the survey constraints. Because of financial limitations, both the terrestrial and marine surveys were conducted with the small boat magnetometer provided by the Program in Maritime History and Nautical Archaeology.

FIGURE 10. Frontal View of Barn



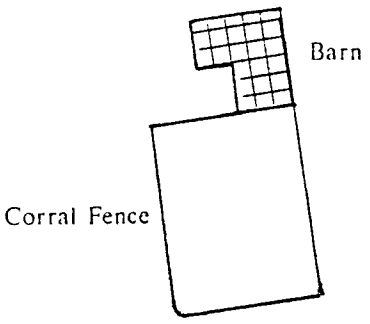


FIGURE 11. Barn Location Relative to Area 2

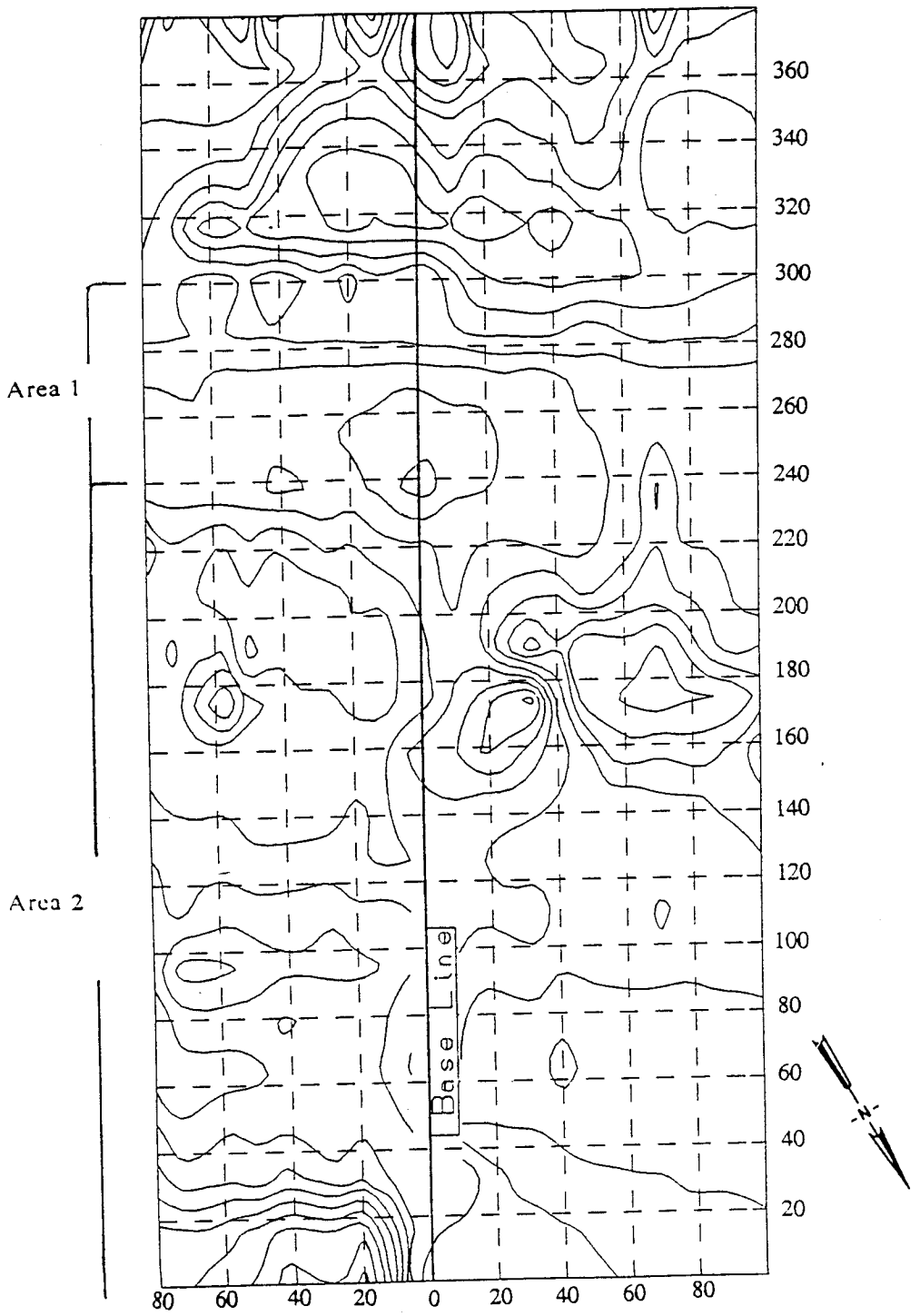


FIGURE 12. Magnetic Contour Map, Areas 1 & 2 (5 Gamma Contour Interval)

This instrument was designed for use underwater and performed to expectations when used in that environment. Its use in the terrestrial portion of the survey, however, involved a compromise in accuracy since it was not designed for that application. The sand matrix of Area 2 was heavily laden with magnetite, which created a "noisy" magnetic background. The configuration of the marine sensor precluded elevating it more than three or four feet above the ground surface, so a considerable amount of interference, or masking, from the

magnetic background occurred. This obscured many of the subtle variations in the local terrestrial magnetic field that were the subject of the survey. The importance of the underwater survey of Area 1, however, justified the compromise, and the results that were obtained from the terrestrial survey were nevertheless sufficient to warrant a second survey the following year, using a different magnetometer.

As depicted in Figure 12, the marine remote sensing survey of the surf zone and near shore waters of Area 1 produced a consistent data set that suggests a relatively uniform magnetic field in this area. The upper edge of the contour map contains what appears to be the edges of two anomalies. These are probably associated with an iron anchor, approximately nine feet in length, that lies in the center of the cove, a few hundred feet offshore. No other significant indications of magnetic variability were apparent in Area 1 and the submerged lands of the cove were subsequently eliminated from further consideration.

Although the scale of the contour interval is small, the map also suggests the presence of two anomalies in Area 2. One lies near grid coordinates 180 South/ 40 West, the approximate location of the brig *Rumiantsev* as depicted in Voznesenskii's 1817 map of the Ross colony (see Figure 6). The edge of a second anomaly appears at grid coordinates 20 South/20 East, near the location of the barn in the 1866 photo described above. Interestingly, after heavy rainfall, copper sheathing nails have been discovered eroding out of the dirt road that terminates in the vicinity of both of these locations (Bill Walton, Dan Murley 1990, pers. comm.).

At the conclusion of the 1990 field season, an evaluation of the small variations in the local magnetic field was made. The locations of the anomalies, the absence of any other apparent magnetic variation, and a basic skepticism about the small boat magnetometer's ability to reliably detect terrestrial magnetic variation, led to a decision to conduct a second remote sensing survey of Area 2 in 1991, in conjunction with the planned survey of Area 3.

1991 Field Season

In August 1991, with a research grant from U.C. Berkeley's Robert H. Lowie Fund and at the invitation of Dr. Kent Lightfoot, Director of the University of California's Fort Ross Archaeological Project (FRAP), a second remote sensing survey was conducted in the cove at Fort Ross. During this second season of field research, which was conducted in conjunction with the FRAP summer field school, an EG & G Geometrics Model G-

856A Portable Proton Magnetometer was used to resurvey Area 2 of the study area. The southern portion of Area 3, the location of the barn as determined from the 1990 field season, was surveyed as well.

After relocating the site datum, the grid system was reinstalled over Area 2. In keeping with the overall approach of the FRAP, the grid was erected on the basis of the metric system, rather than on the traditional U.S. system of feet and inches used in the 1990 survey. Using a theodolite, the baseline was reestablished at 206°. It extended across the beach a distance of 72 meters, slightly shorter than the previous season's baseline. After the end point of the baseline was determined, the theodolite was positioned at a point six meters down the baseline from the datum. That point was staked and from it, a line perpendicular to the baseline was surveyed to the east and west of the baseline. This procedure was repeated in six meter increments down the length of the baseline until the 72 meter mark was reached. Each of the perpendicular lines extended a distance of 24 meters on the east side of the baseline, while on the west side the lines varied in length from 4.6 to 30 meters, depending on where they intersected the base of the bluff. The perpendicular lines were also staked at six meter intervals, thus creating a grid of six meter squares that was almost identical to that used in 1990. The addition of one perpendicular line on the north side of the datum mark extended the grid system six meters to the northeast. This was done to control testing of the suspected anomaly identified at 20 South/20 East in 1990 (see Figure 12).

With the assistance of students from the FRAP summer field school, the grid area was resurveyed with the G856 magnetometer. This type of magnetometer employs a smaller sensor than that of the small boat marine magnetometer used in the previous year's survey. Mounted at the top of an eight foot staff, the sensor head is cabled to a small console carried by the surveyor in a lightweight chest harness. With the G856 magnetometer, a two person team, one carrying the staff-mounted sensor, the other wearing the console, collected readings of the magnetic field at three meter intervals along each gridline. A reading was recorded at each six meter stake on each line, and at the mid-point between each stake. The readings were stored in the magnetometer's memory during the survey process, then later downloaded from the console into a computer using EG&G Geometrics' Magpac (version 4.1) software for post-survey data processing. The Magpac programs were also used to prepare the raw survey data for analysis and interpretation in Golden Software's Surfer (version 4.0) contouring program, which was used to produce a contour map of the magnetic field in Area 2 (Figure 13).

Following analysis of the contour map, seven anomalies were selected for testing. Over a three day period, seven 1-x-1 m test units were hand-excavated to variable depths (Figure 14). Test unit 1 was installed at a point .5 m east of the stake located at 24S on the baseline. At a depth of 20 cm, a 10 cm lens of black, fibrous organic matter was encountered. Sterile sand lay below the organic stratum to a depth of 55 cm, where the water table was encountered. The source of the anomaly could not be identified. Test unit 2 was installed 1 m south of the stake located at 36S/6W. The unit

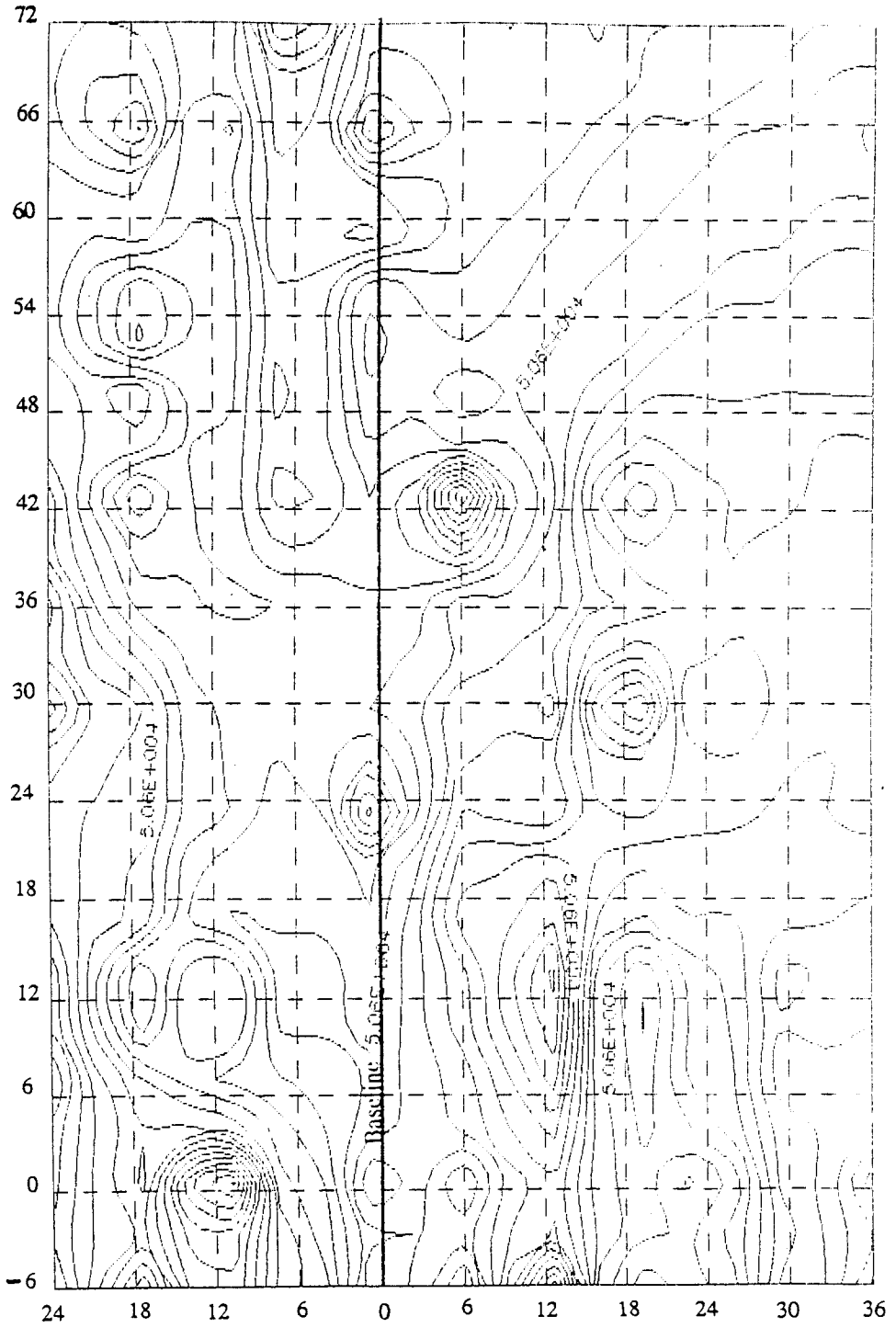


FIGURE 13. Magnetic Contour Map, Area 2. (5 Gamma Contour Interval)

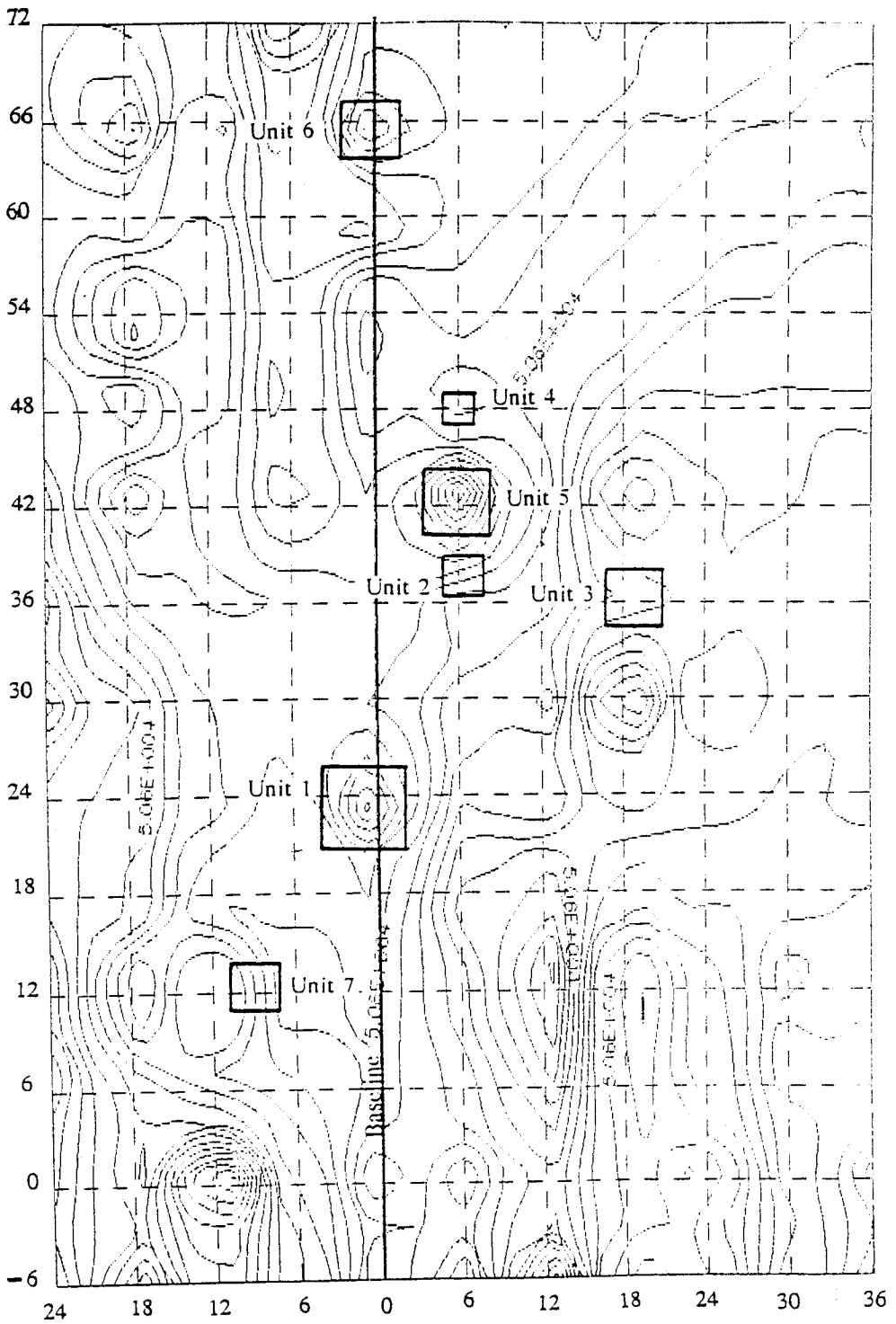


FIGURE 14. Test Units, Area 2.

was excavated to a depth of 83 cm, where the water table was encountered. The unit was sterile and the source of the anomaly could not be determined. One meter east of the stake at 36S/18W, a third 1-x-1 m unit was attempted. It was abandoned when a thick stratum of river cobble, unpenetrable by hand excavation, was encountered just below the surface.

Test unit 4 was installed 1.5 m north of the stake at 48S/6W. It was excavated through sterile sand to a depth of 115 cm, where the unit was abandoned. No evidence of the anomaly's source was discovered. Test units 5 and 6, the former at 42S/6W, the latter at 66S/3E, were both excavated to a depth of 125 cm. Both were sterile and no evidence of either anomaly's source was observed.

Prior to excavating more test units, the magnetometer was redeployed in an attempt to refine the location of the anomalies. The sensor was removed from the 8 ft. staff and placed in a small pouch on the back of the magnetometer console's harness. In this manner, a single surveyor could walk across the source of the anomaly, unencumbered by the staff, and observe the variation in the local magnetic field as it registered in the console. By making repeated, alternating traverses across the location of the anomaly as depicted on the contour map, the high and low values of the local magnetic variation were defined, and the center of the anomaly was located.

Test unit number 7 was excavated at 15S/9E after the center of the anomaly was identified using this method. At a depth of 20 cm a thick, black stratum of unidentifiable organic material was encountered in the 1-x-1 m unit, similar in appearance to that

observed at the same depth in test unit 1. Beneath the lens of organic material, an accumulation of burned rock was uncovered, resembling the stones of a fire ring in both appearance and arrangement. The rocks did not appear to be associated with the stratum of organic material. The excavation continued through sterile beach sand to a depth of 60 cm, where it was abandoned. A water pump provided by the State Historic Park was used during this excavation to control the influx of water into the test unit from the water table.

The anomaly depicted at 24S (the location of test unit one) was then reexamined to determine its center. After several traverses were made across the location depicted on the contour map, the center of the anomaly was defined at 21S/2E, where a 1-x-1 m test unit was excavated. The pump was again employed to control the intrusion of water into the excavation. At a depth of 67 cm, the end of a flat, metal bar was encountered, 4 cm in width and .5 cm thick.

The following day was to be the last for the FRAP field school, so efforts were concentrated on expanding the excavation to determine the length of the bar, which lay in an east-west orientation. A total of 2.2 m of the bar were ultimately exposed before the excavation was terminated. The bar continued into the east wall of the excavation an undetermined distance. No other cultural material was recovered in the excavation. Before the excavation was backfilled, a small sample, approximately 5 cm in length, was removed from the end of the bar for analysis.

This sample was subsequently examined by Dr. Mark Hall of the U.C. Berkeley Archaeological Research Facility who subjected it to metallographic analysis. Dr. Hall

determined that the sample was composed of fairly pure iron with numerous slag stringers. He concluded that the bar was probably produced in a blast furnace typical of those used in Great Britain in the late 19th century, thus ruling it out as a possible remnant of the shipyard activities (Mark Hall 1992, pers. comm). In view of this interpretation, it seems more likely the iron bar was associated with the later ranching period at Fort Ross.

While the excavation of the metal bar was underway, several volunteers conducted a magnetometer survey in the area identified in the 1866 photograph as the location of the historic barn. The surveyors established a baseline along the projected alignment of the barn's southern elevation. The end points defining the baseline were surveyed from the primary site datum. One point lay 62° and 31 m from the primary site datum, the other at 6.5° and 19 m. Parallel to the second baseline, ten transects were established at 3 m intervals across the area. Six of these lay on the north side of the new baseline, three on the south side (Figure 15). With the magnetometer configured in survey mode, a two person team walked each of the transects in alternating directions, recording the magnetic field at 3 m intervals along each transect. At the conclusion of the survey, the data was downloaded and computer-processed as in previous surveys to produce a contour map of the area's magnetic field (Figure 16). A significant magnetic anomaly was identified in the location projected to be the front of the barn (Figure 17). The area of the anomaly was densely overgrown with native vegetation, which precluded a surficial investigation of the site. No further investigation was made of the anomaly at that time since, with the closure of the FRAP field school, the 1991 field season came to an end.

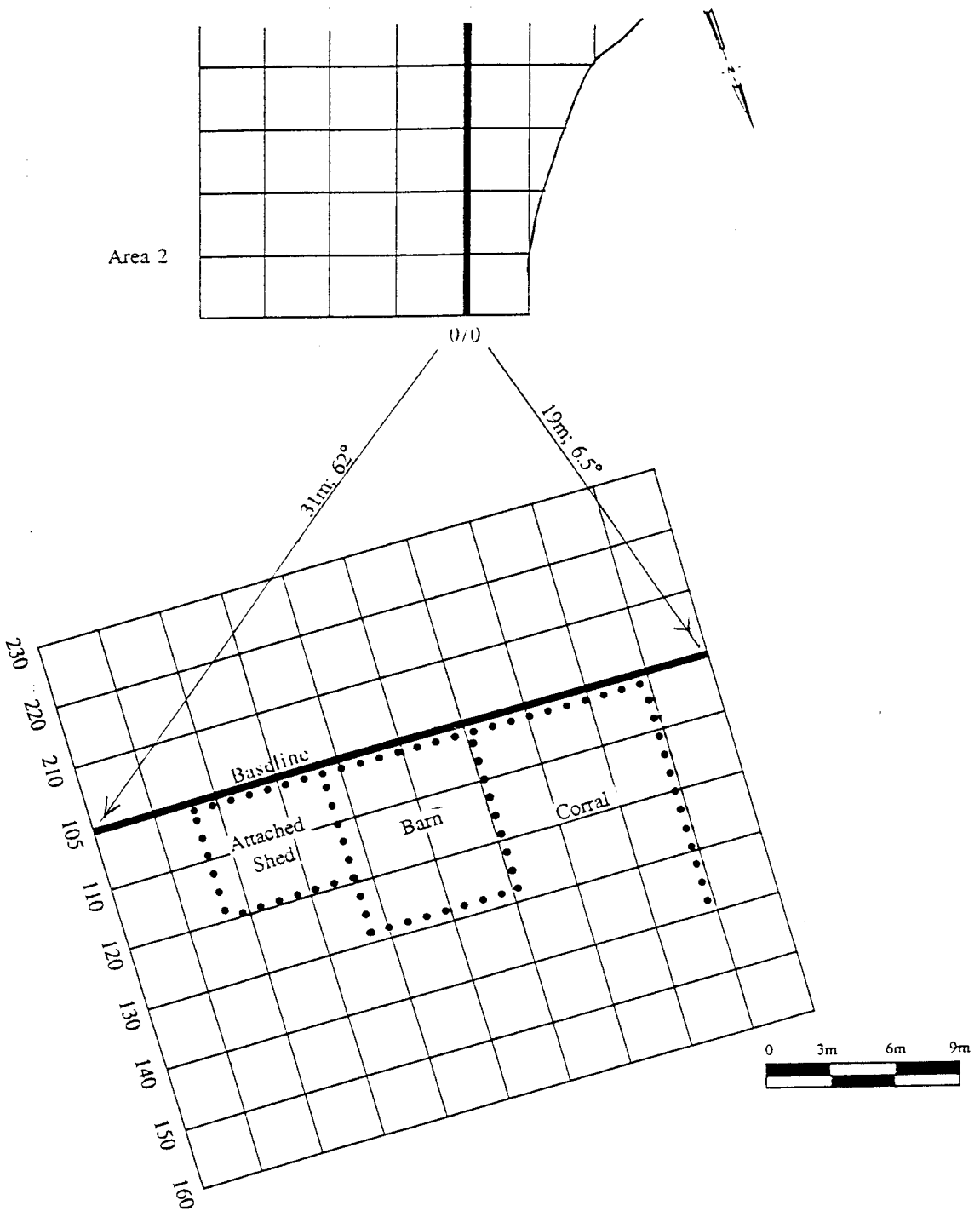


FIGURE 15. Survey Grid of Historic Barn Location.

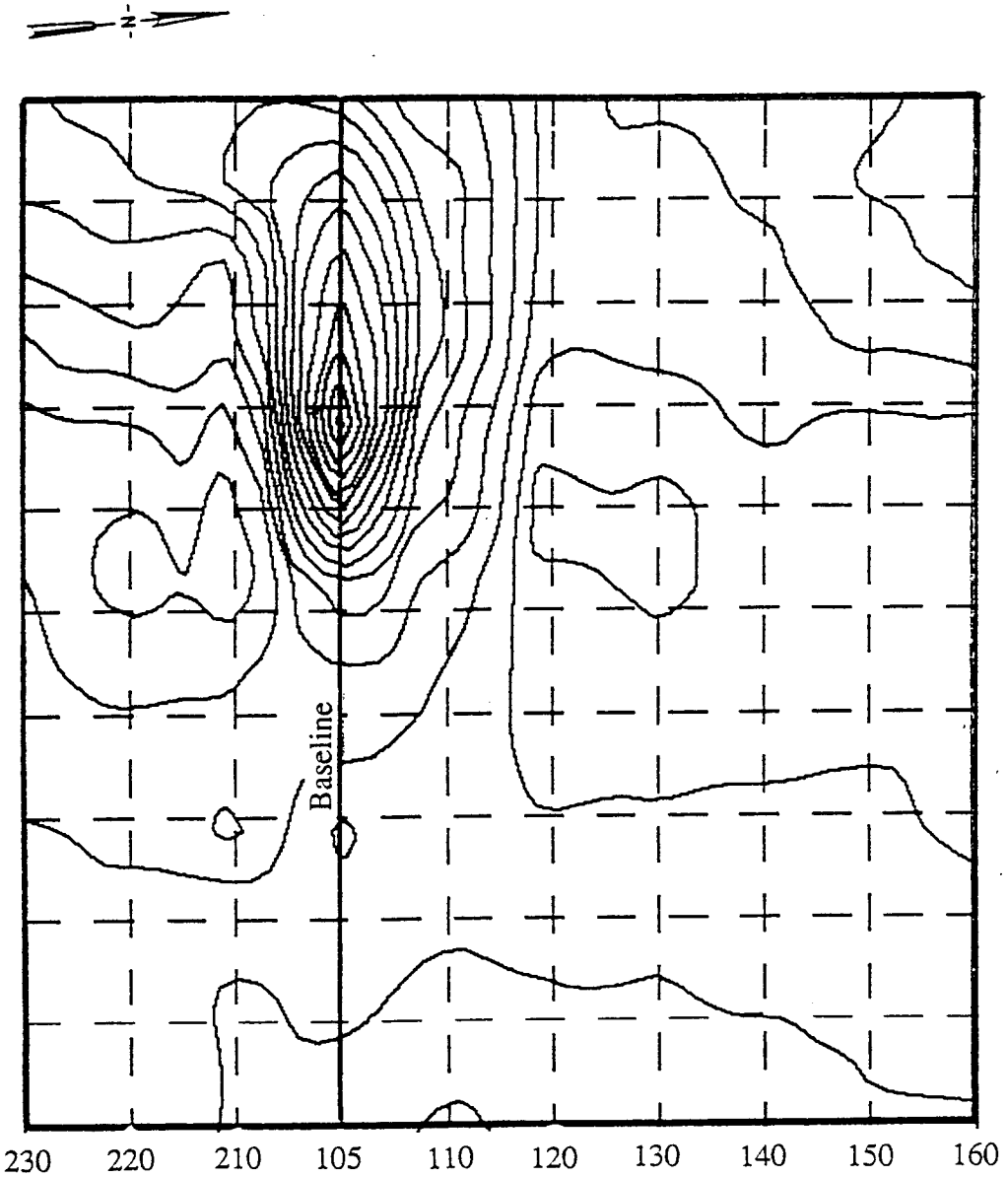


FIGURE 16. Magnetic Contour Map, Barn Area. (10 Gamma Contour Interval)

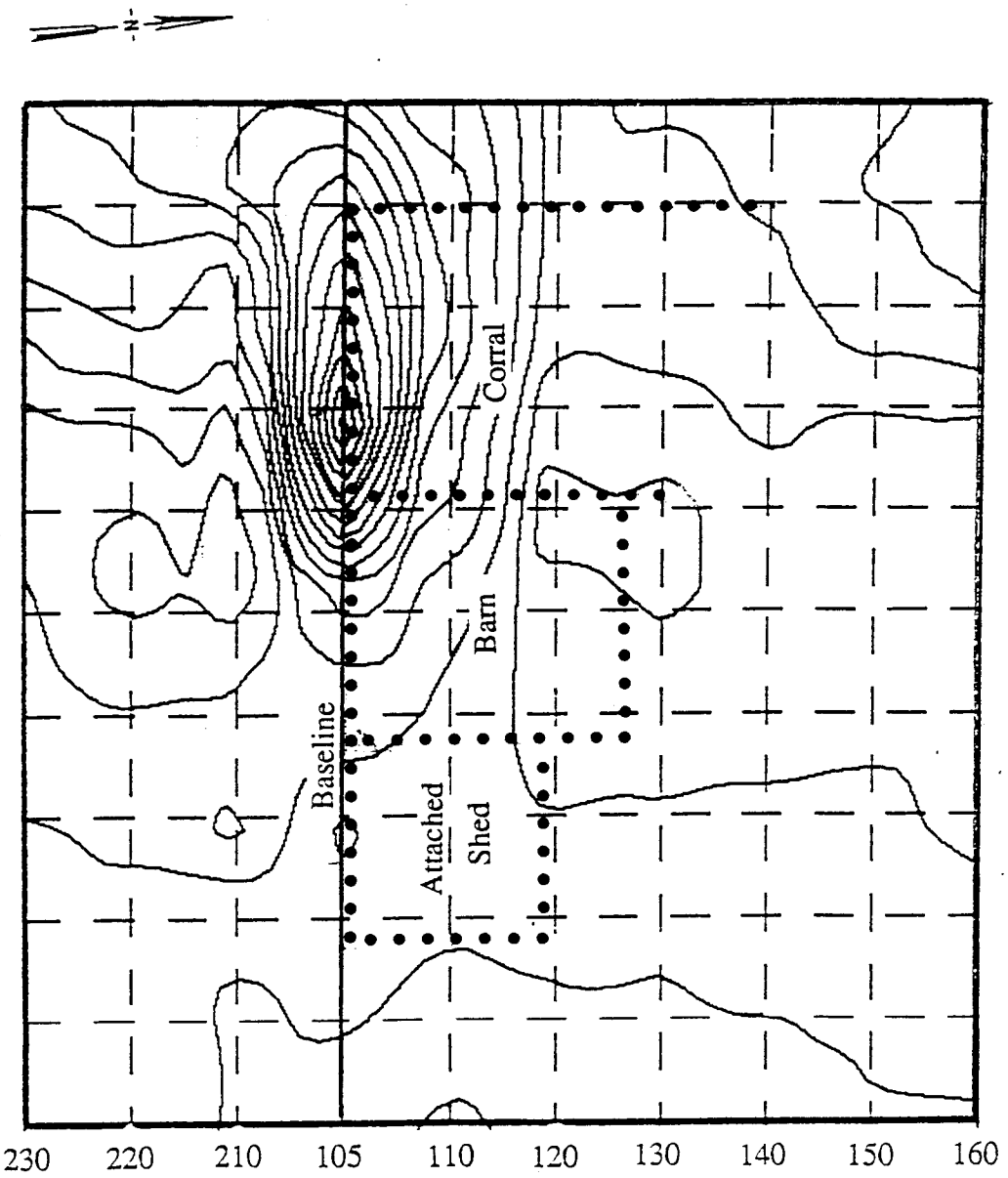


FIGURE 17. Magnetic Contour Map on Plan of Barn

Although no definitive evidence of the shipyard was uncovered during the season, the efficacy of the survey methodology and the reliability of the remote sensing data were demonstrated with the discoveries of the iron bar and the firepit. Most of the research effort of the 1991 field season was invested in resurveying Area 2 with the G856 magnetometer, and the phase 2 testing of selected anomalies within the boundaries of Area 2. Consequently, at the end of the season the scheduled magnetometer survey of Area 3 still remained to be done, as did the investigations of several remaining anomalies in Area 2 and the large anomaly in the location of the historic barn.

With these aspects of the project undone, a second research effort was put forth in October of 1991. Over a five day period, the project director and two volunteers established a survey grid and conducted a magnetometer survey over Area 3 in order to develop the data necessary to plan the 1992 field season.

Area 3 lies to the northeast of Area 2 at an elevation approximately 12 ft. below that of the site datum. In order to facilitate erection of the grid over Area 3, a secondary datum was established on the lower elevation at a point 116° and 61.3 m from the site datum. The location of the secondary datum was selected to maximize the areal extent of the survey grid. From the secondary datum point, a line 75 m in length was surveyed at 26°, creating a baseline for Area 3 parallel to, but northeast of, the Area 2 baseline. A second line was then surveyed at 296°, perpendicular to the new baseline. This line's western terminus was the base of the road on which the primary site datum had been established.

The baseline for Area 3 was staked at 3 m intervals and at each of those locations, a line perpendicular to the baseline was established at a bearing of 296°. The end of each perpendicular line was staked at its western terminus. Line lengths varied with the configuration of the grid's western boundary, but average length was approximately 60 m. (Figure 18). The completed outline of the grid encompassed the location of the barn and portions of Fort Ross Creek, which was then flowing at little more than a trickle. When the survey commenced, a 100 m fiberglass measuring tape was extended between a baseline stake and the stake marking that line's western end, creating a transect along which readings were taken at 3 m intervals.

In order to increase the sensitivity of the magnetometer survey for Area 3, an EG&G G856 magnetometer configured with a gradiometer option was used. This option provides a second sensor, mounted near the middle of the staff, beneath the single sensor secured to the top. When a reading of the magnetic field is taken, the sensors are successively polarized and one sensor records a reading of the field within seconds of the other. In post-survey data processing, the readings are subtracted from each other, leaving a value equal to the magnetic field at the location of the reading. With a gradiometer, disturbances in the magnetic field created by external influences, such as magnetic storms, solar flares, etc., affect both sensors, and consequently are filtered out, creating a more discrete reading of the local magnetic field.

> Gradiometers ". . .automatically remove the regional magnetic gradient to better define the shallower anomalies assumed to be of interest. Also, the magnetic time variations, including the effects of magnetic storms, are effectively removed" (Breiner 1973: 49).

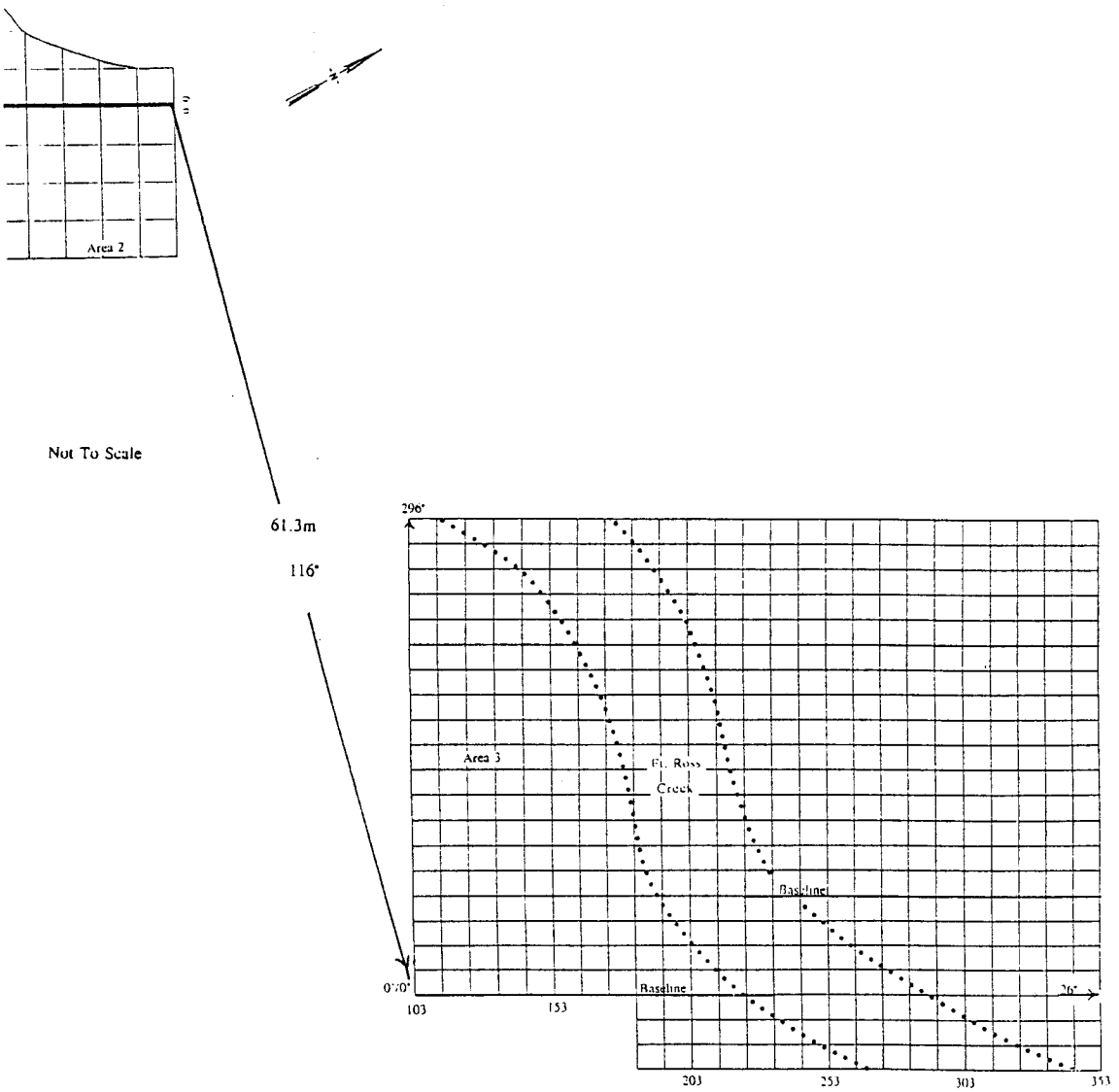


FIGURE 18. Survey Transects, Area 3

A total of 26 lines were surveyed across Area 3. As in previous surveys, data was computer-processed through EG&G's Magpac software and transferred to Golden Software's Surfer program for contouring. The results of the gradiometer survey indicated numerous anomalies in Area 3 well in excess of the 10 gamma contour interval (Figure 19). Of particular interest was the cluster of anomalies near the projected location of the historic barn, and the unusually large anomalies northeast of them.

1992 Field Season

Twelve anomalies identified in the 1991 survey of Area 3 were selected for testing during the 1992 field season. As in 1991, field research was conducted in conjunction with the summer field school of the University of California's Fort Ross Archaeological Project.

In July 1992, the grid baseline for Area 3 was reestablished in its 1991 location. From the magnetic contour map developed in the 1991 survey, the coordinates of the anomalies to be tested were identified relative to the baseline. Using a theodolite positioned on the baseline, volunteers located the positions of the anomalies and marked them with wood stakes, placing one in each corner of a square that surrounded the location of each anomaly (Figure 20).

Testing of the anomalies commenced with the assistance of students from the FRAP field school. The volunteers excavated a 6 x .5 x 1 m trench through the west edge of anomaly 1 and into the center of anomaly 2 in an attempt to determine the sources

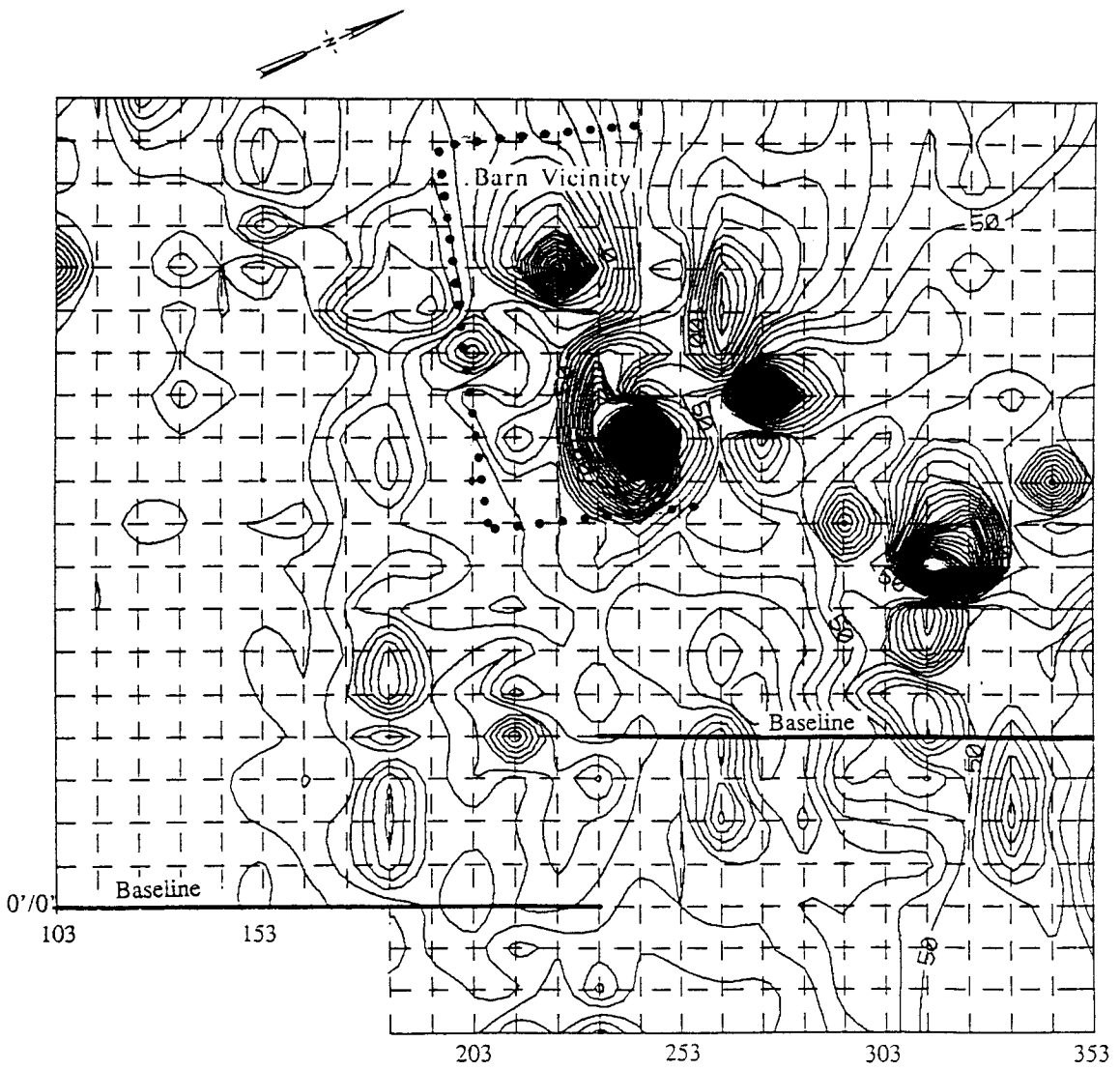


FIGURE 19. Magnetic Contour Map, Area 3. (10 Gamma Contour Interval)

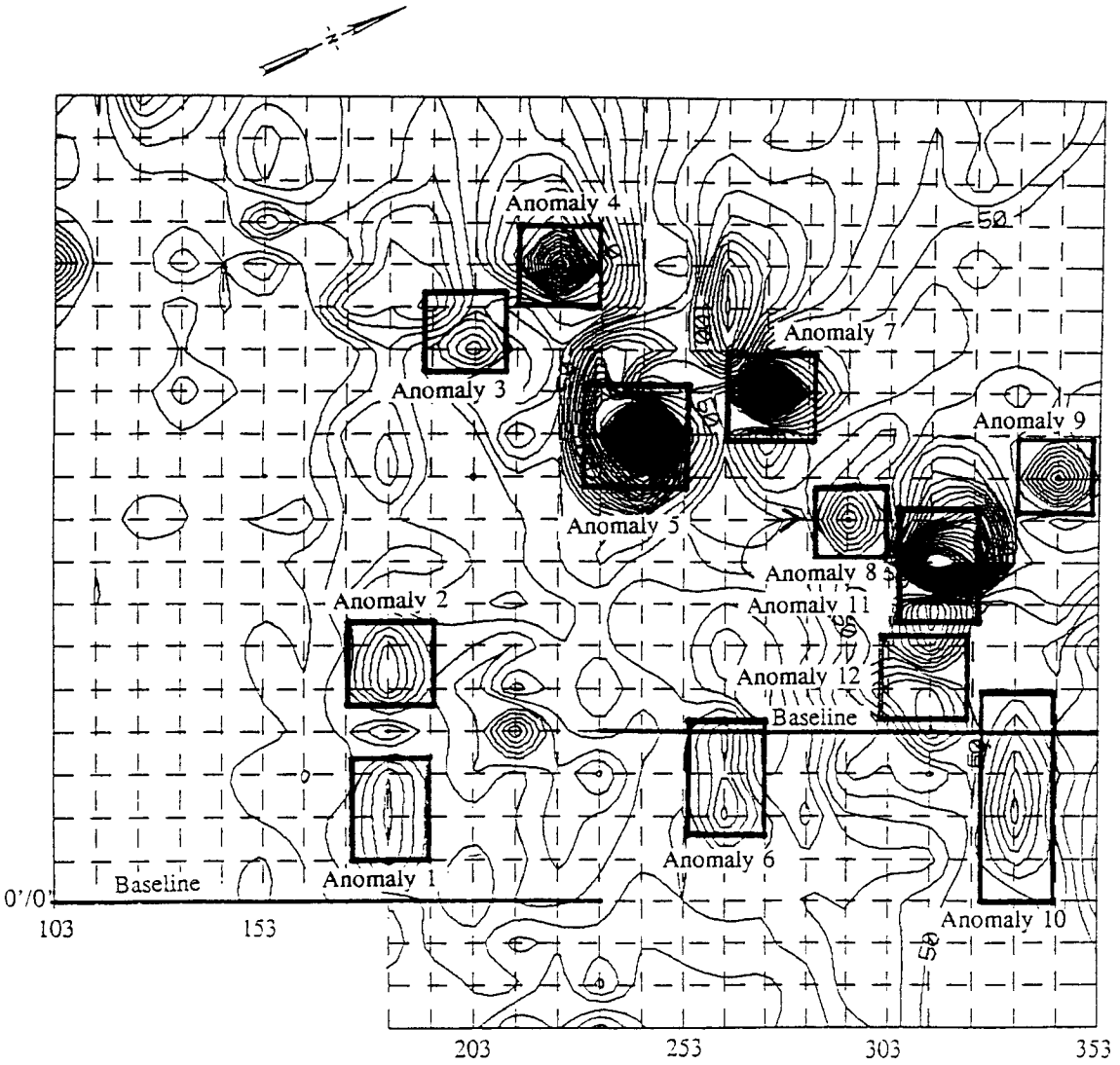


FIGURE 20. Magnetic Anomalies Designated for Testing, Area 3.

of magnetic disturbance. The trench excavation passed through alternating lenses of river cobble. It was culturally sterile and produced no indication of a source of magnetic disturbance. Financial restraints had precluded leasing a magnetometer for the 1992 field research, so it was not possible to locate precisely the position of the anomalies through remote sensing, as had been done the previous season.

With the absence of any indication of the sources of magnetic disturbance in the first test excavations, the location of the baseline was re-checked to verify its proper placement. Measurements were taken to points known from the 1991 survey. These measurements indicated that the baseline as it was established in 1992 was approximately 2 m east of the 1991 location. The position of the secondary datum that anchored the Area 3 baseline was then rechecked from the location of the primary site datum. It appeared to be positioned correctly.

Subsequent investigation revealed that the theodolite used in the 1991 survey, and to that point in the 1992 field session, had a faulty compass. The bearings used to establish the grid over Area 3 in 1991 were incorrect and consequently unrepeatable. That theodolite was immediately replaced.

A second theodolite was then used in an attempt to reestablish the proper location of the magnetic anomalies in Area 3. The stakes defining the anomalies to be tested were moved a distance estimated to be equivalent to the degree of error. Without a magnetometer, however, it was not possible to verify that the new positions were in fact, over the anomalies. The few days remaining in the 1992 season were devoted to testing

more of the anomalies. A 1-x-1 m test unit was excavated in the corrected location of anomaly 2. It proved to be predominately comprised of river cobble, with no apparent source of magnetic disturbance.

On the final day of the field season, the FRAP field school excavations on the bluff above the cove were backfilled with the assistance of a small backhoe. When the task was completed, the backhoe was brought down to the cove to mechanically test one of the anomaly locations. The limited time available and the convenience of an access route helped isolate the test location to an anomaly east of anomaly 1, at the base of a steep cliff that defined the cove's eastern side (Figure 21). There, in 10 cm. levels, the backhoe was used to excavate a 1-x -5 m trench to a depth of 80 cm. The matrix of each of the 10 cm. stratum was a grainy mixture of culturally sterile beach sand and clay. At 80 cm., however, the edge of a hard-packed clay stratum appeared. The edge, which ran the length of the trench, protruded approximately 15 cm. into the trench from the eastern sidewall. The grainy sand and clay matrix observed in the higher strata continued along the west side of the trench and down into the lower stratum. The hard-packed clay stratum resembled the edge of a dirt floor or possibly a path, although no cultural material was recovered from the exposure to suggest that it was either. The location of the apparent feature was staked and recorded, the excavation was backfilled, and the 1992 season came to an end.

In October 1992, the project director met with the Department of Parks and Recreation (DPR) Regional Archaeologist, staff archaeologists, and the director of the Fort Ross Archaeological Project. Results of the shipyard project to date were discussed,

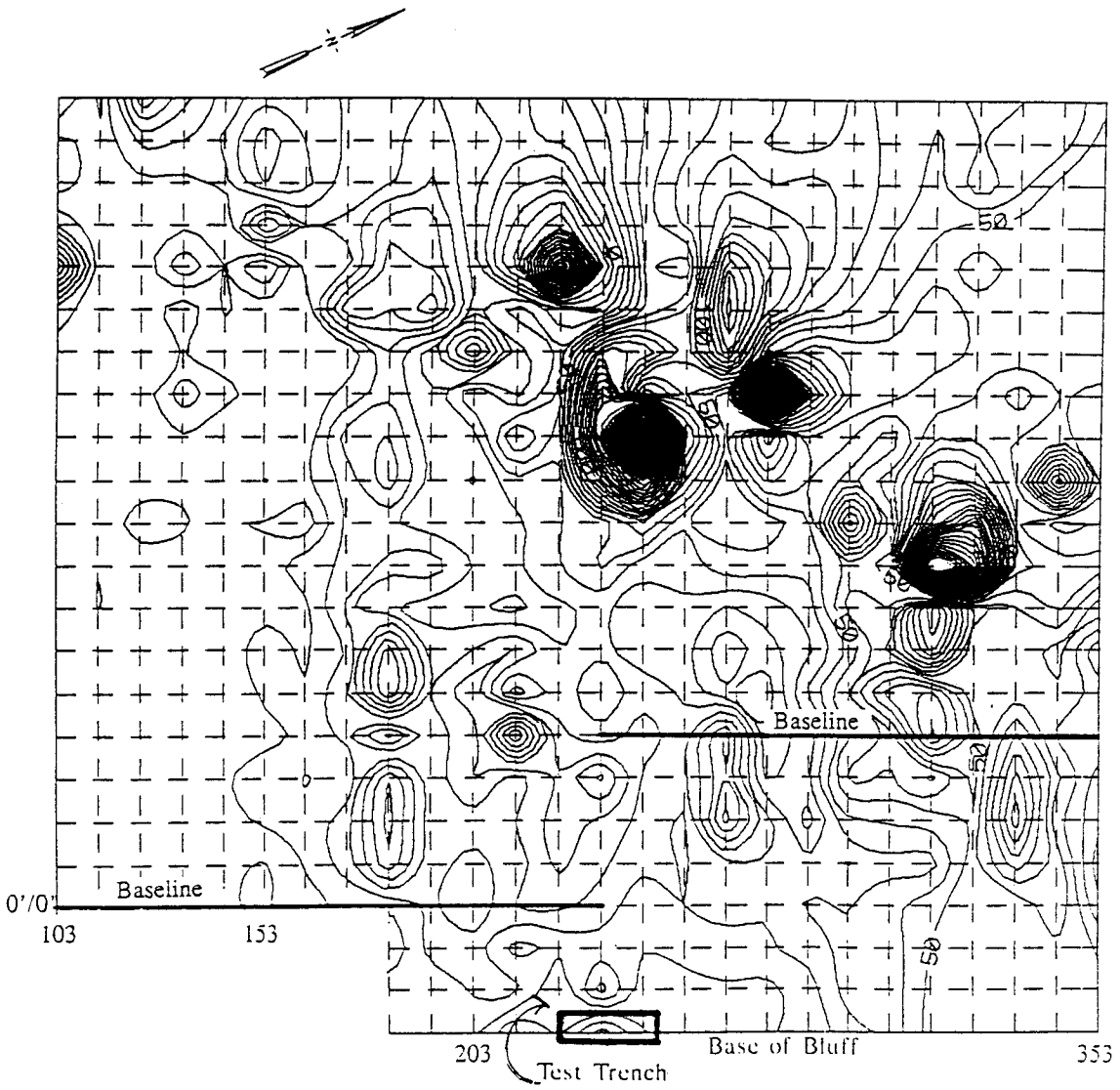


FIGURE 21. Test Trench, Area 3.

as were plans for further research and test excavations. A revised research design based on the information developed from the magnetometer surveys was reviewed. It was agreed that the anomalies possessing the most promise of providing information about the shipyard activities were those lying in the vicinity of the historic barn, and those in Area 3.

Unfortunately, most of those also lay beneath the cove's picnic area, which would have been damaged by test excavation and made unavailable to park visitors during testing activity. Other anomalies lay in the streambed of Fort Ross Creek. Department personnel felt test excavations there would have required permitting from the Army Corps. of Engineers. In combination with the complete absence of available park funding to either assist in the testing or repair the tested sites, these factors led the DPR archaeologists to suggest a moratorium on further subsurface testing in the Fort Ross cove. In light of the budget crisis within the State of California, it was agreed that resumption of phase 2 testing would be evaluated in the context of the annual DPR budget which, to date, has worsened in each successive year. Consequently, the phase 2 testing program remains in abeyance.

Chapter 7

Conclusions

Although the limited phase 2 testing conducted in the 1991 and 1992 field seasons did not produce any significant archaeological evidence of the Ross colony shipyard, several interesting results were achieved. Identification of the exact location of the historic barn, demonstration of the efficacy of survey methodology, and correlation of the historic record with positive test results have provided a sound basis from which the research project may be continued.

Historic Barn

When the RAK sold their California properties to John Sutter in 1841, a detailed "Inventory of Structures and Chattels" was drawn up. Included in it were the dimensions of the numerous structures included in the sale. The inventory was subdivided on the basis of the colony's geographical areas, one of which was the following:

> Outside the fort there are the following structures:
> A forge and blacksmith shop, built of planks, 5 1/3 sazhens long by 3 2/3 arch.[arshins?] wide, with 4 partitions.
> A tannery, 5 sazhens long by 3 wide.
> The public bath, 5 sazhens long by 2 1/2 wide.
> A cooperage, 10 sazhens long by 5 wide.
> A shed for the *baidarkas*, on beams, 10 sazhens long by 5 wide (Dmytryshyn1989:432).

"Outside the fort" clearly pertains to the area of the cove, as evidenced by the shed for the baidarkas[1] and the fact that a separate subdivision of the inventory was labeled "around the fort", and contained descriptions of buildings known historically to have been on the coastal terrace. Except for the measurement labeled "arch." that described the width of the forge and blacksmith shop, every linear measurement in the inventory was described in *sazhens*, a Russian unit of measurement equal to 7 feet (Farris 1983). The "arch." that describes the width of the forge and blacksmith shop has not been identified as a Russian unit of measurement and probably is a transcription or translation error. The original document from which this translation was made was written in French and, although a Spanish version exists, no Russian version of the document has been found (Dmytryshyn 1989: 432). For purposes of this discussion, it is assumed the width was measured at 3 2/3 sazhens, not "archs." The forge and blacksmith shop was described in the inventory as measuring the equivalent of 37.3 ft in length and 25.7 ft in width, while the tannery measurements were the equivalent of 35 ft in length and 21 ft in width.

The size of the historic barn, as measured with the technique developed by Prince (1988), is approximately the same as either the tannery, or the forge and blacksmith shop. Measurements taken in the field survey indicated the barn measured approximately 37 ft in length and 27 ft in width. Although these measurements cannot be considered exact

[1] *Baidarkas* were the one or two-man skin boats used by the Aleuts to hunt sea otter and other sea mammals.

due to the distances over which the barn's image was projected, the degree of accuracy derived from the Prince method was illustrated at the conclusion of the survey. While retrieving a pin flag that marked one of the corral corners, a volunteer stumbled over a heavily-decayed stub of an embedded wood corner post that lay hidden beneath the dense vegetation. The pin flag marking the location of that corner had been placed within a foot of the actual corner post. Absolute identification of the stub as a remnant of the corner post depicted in the 1866 photograph cannot be made, but its condition and location strongly suggest they are the same This discovery served to greatly increase confidence in the measurements taken for the barn.

Comparing the measurements of the barn to those of the structures listed in the inventory eliminates the bath (35 ft long x 17.5 wide), the cooperage (70 ft long x 35 ft wide), and the *baidarka* shed (70 ft long x 35 ft wide) from consideration as possible uses of the barn structure, leaving the tannery and the forge/blacksmith shop as possible explanations of the building's purpose. As described in the 1879 *History of Sonoma County*:

> To the south of the stockade, and in a deep gulch at the debouchure of a small stream into the ocean, there stood a very large building, probably eighty by a hundred feet in size. The rear half of it was used for the purposes of tanning leather. . . . The front half, or that fronting the ocean, was used as a work-shop for the construction of ships. Ways were constructed on a sand beach at this point leading into the deep water of the cove, and upon them were built a number of staunch sea-going vessels (Munro-Fraser 1880:367).

The dimensions provided in this description are undoubtedly incorrect, as no structure listed in the Inventory of Structures and Chattels, except the stockade itself, even

approaches these measurements in size. However, the historic barn's proximity and orientation to the water suggests it may, in fact, have been the tannery/workshop. On the other hand, the extremely large magnetic anomaly located in front of the barn and identified in the 1991 remote sensing survey (see Figure 19) suggests the building may have been the forge/blacksmith shop. No description of the forge/blacksmith shop is provided in the county history to shed more light on the interpretation of the historic barn. As the project continues, this area will be tested in an effort to use the archaeological record to determine the function of this building, and to determine its relationship to the Ross shipyard.

Survey Methodology

The practicality of the surveying methodology and the reliability of the data recovered were demonstrated with the positive results obtained in two of the seven test units excavated. Using the magnetometer to refine the orientation and determine the centers of the magnetic anomalies, a success rate of 100% was achieved in locating the source of the anomalies in the two instances the technique was employed. Although neither the campfire ring nor the metal bar appeared to be associated with the shipyard, the fact that their magnetic signatures were identified, and their locations determined through ground-truthing, bodes well for further testing. Anomalies identified in the field surveys will be tested in similar fashion, particularly those in the vicinity of the historic barn, in an effort to identify any association with the shipyard. A demonstrated, positive

relationship between such tests and the remains of the shipyard will provide sufficient incentive to develop the phase 3 excavation program. Where appropriate, such a program will encompass larger scale, clearing excavations to address the research questions developed in this project's research design.

Test Correlation

One further result of the project work completed to date is the correlation of positive test results with the historic record. In the course of conducting archival research on the history of the Fort Ross area, an undated photograph of the fort was examined. It had been taken from the same terrace used in the 1866 photo, but from a different view point. Evident in the foreground were the roofs of several buildings that had been constructed on the beach, hard against the bluff that defines the cove's eastern side. These were small cabins used in the 1920s and 1930s for weekend visitors to the cove, which apparently was a popular destination for weekend campers. The significance of the cabins to the project lies in the fact that they were located in the same area as the compacted clay lens exposed at the conclusion of the 1992 field season. This lens, as described earlier, appeared to be the edge of a dirt floor, or possibly the edge of a path. Its proximity to the location of the cabins adds credibility to either of these interpretations. Although the source of the magnetic anomaly that was the subject of the excavation was not located in the test trench, the anomaly's proximity to the historic location of the cabins, and the identification of what appears to be a compacted clay feature in possible association with

them, suggests the anomaly is not related to the shipyard. It will consequently be eliminated from further consideration.

Successful elements of the project to date include the remote-sensing surveys designed to locate magnetic anomalies, the testing approach developed to identify their source, and the use of the historic record to both inform and interpret the archaeological record. These successes will be incorporated into a revision of the project's research design that will involve a less intrusive approach to subsurface testing, such as hand auguring and mechanical coring. With the acquisition of additional funding, the testing of anomalies will proceed, culminating in excavation of those anomalies that are positively linked to the shipyard remains. Such excavations will be designed to recover data necessary to address the issues raised in the project's research design. In so doing, the contribution of the bold Russian adventure at colony Ross to the maritime history of California may be more fully recognized, and the archaeological remnants of their endeavors hopefully may be interpreted for the public at large.

Epilogue

The above-normal rainfall in California that accompanied the heavy winters of 1995 and 1996 brought record snows to the state's higher elevations, and swelled the rivers and streams that drain its several mountain ranges. One such stream is Fort Ross Creek, normally a small waterway that, with several others, flows off of the western sides of the Coast Ranges and empties into the Pacific Ocean. The winter rains substantially

increased the flow of water through the creek, and transformed its normally tranquil movement into a considerable discharge. The high flow of water exceeded the capacity of the shallow channel that normally directs the creek through the Park, across the cove's beach, and into the Pacific. The swiftly moving waters of the creek changed course to run against the embankment of the access road that opens onto the beach. Over the course of two winters, the subsequent stream erosion began to expose a rock and cobble foundation, associated with wood fragments, in the embankment's sidewall. Previously covered with the overburden of the road cut, the foundation may be associated with an untested magnetic anomaly that appears in virtually the same location on contour maps prepared from both the 1991 and 1992 remote sensing surveys. The area in which the foundation is located is also one from which copper sheathing nails are frequently recovered by park rangers after heavy rains have washed away portions of the dirt road's surface (Dan Murley, Bill Walton 1990, pers.comm.)

To protect both the archaeological feature and the road embankment from further erosion, park rangers, volunteers, members of the California Conservation Corps and AmeriCorp attempted in early 1996 to direct the flow of the creek away from the road embankment. Upstream from the cove, large boulders and uprooted tree trunks were used to redirect the creek and encourage the creation of another creek channel. The effort was successful and the creek flow was redirected across the center of the cove's beach, away from the road embankment. The volume of water flowing through the new channel soon cut through the thick stratum of beach sand and by March 1996, the creek had eroded a

channel more than 8 ft. deep through the sandy beach. The depth of this cut reached to the clay substrate, in which were embedded two pair of parallel wood planks (Figure 22). The streamflow was still covering the planks when they were observed, but it was possible to obtain some of their dimensions. The planks were approximately 9 cm. thick and ranged in width from 31 to 35 cm. They protruded from beneath the side of the stream channel, so overall length could not be determined. What was exposed measured approximately 80 cm. in length before disappearing beneath the sand of the stream channel wall. The planks comprising each pair were aligned next to each other, and the pairs were separated from each other by approximately 80 cm. Nearly 1 m. to the east, and also in the stream bed, were two beams of undetermined length, that measured approximately 13 x 18 cm. The beams lay parallel to each other and were oriented perpendicular to the planks. The parallel edge of one more could be seen beneath the sand wall of the stream channel. A sharply-pointed, wrought iron nail, recovered from one of the planks, is presently undergoing analysis. No other metal fasteners or fittings were observed.

Although it is premature to attempt an interpretation of this feature, its location near the center of the cove, in the area suspected to have contained the launching ways, its depth and configuration, and its hand-hewn appearance, strongly suggest a remnant portion of the launching ways may have been uncovered. Applications for funds to archaeologically document the exposed rock and cobble foundation, and the curious alignment of planks beneath the cove's beach are pending. In conjunction with research

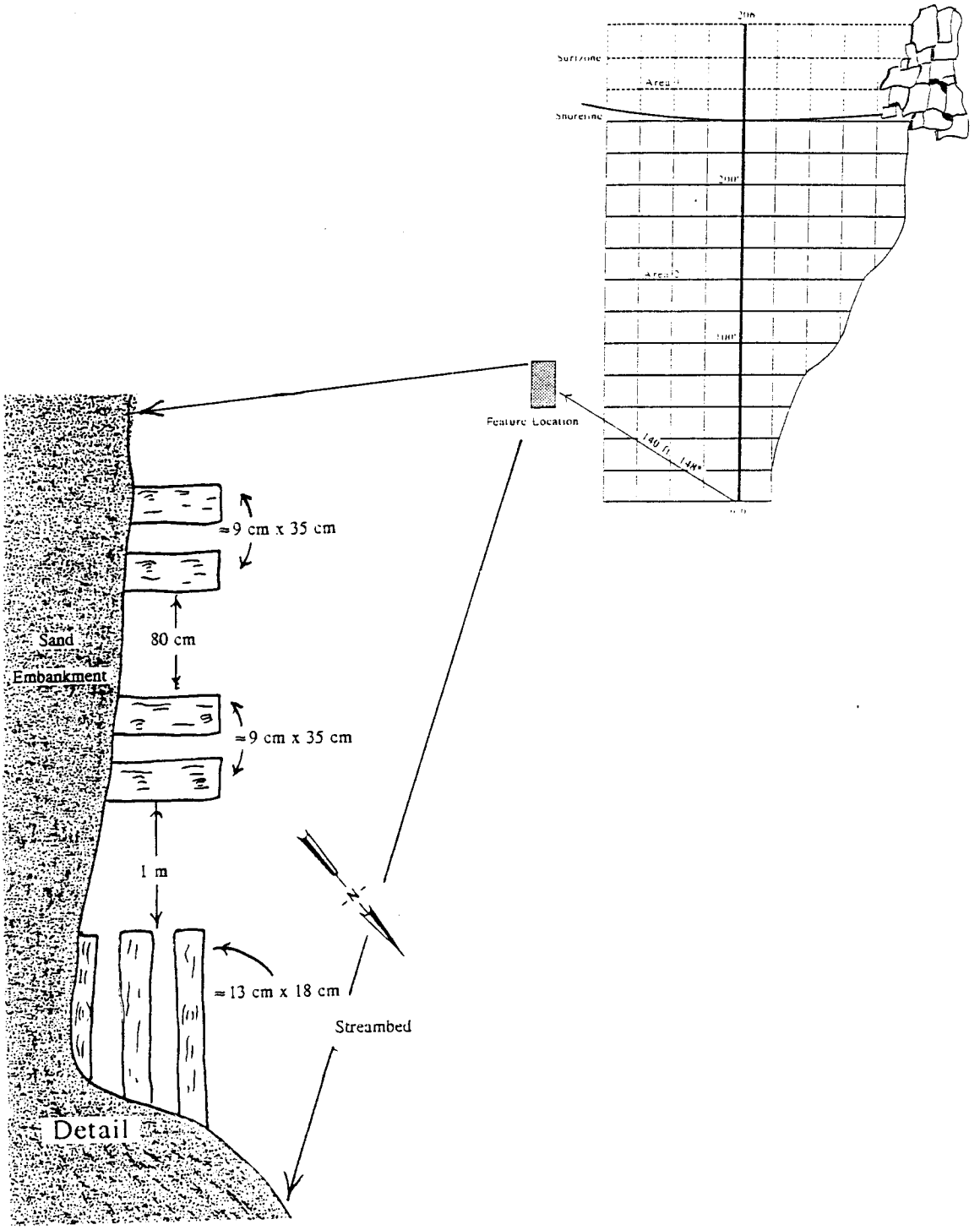


FIGURE 22. Location and Orientation of Possible Launching Ways Remnant

completed to date, the careful examination of these two fortuitously exposed features may provide a unique glimpse into the operations of California's first shipyard.

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